हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. १५६० /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–एक के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

————00————

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–एक के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2019–20 से लागू किये जाते हैंः–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी, प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान, लाईब्रेरी साईंस
2. बी.एस–सी. – आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.एस.सी– (गृह विज्ञान) आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।
4. विधि – एल.एल.बी.
5. प्रबंध – बी.बी.ए.

उपरोक्त विषयों को शिक्षा सत्र 2019–20 से संशोधित रूप में स्नातक स्तर भाग–एक के लिए लागू किया जाता है स्नातक स्तर भाग दो एवं तीन के पाठ्यक्रम यथावत रहेंगे।

अतः आपसे अनुरोध है कि पाठ्यक्रम परिवर्तन/संशोधन से महाविद्यालय के शिक्षकों एवं छात्र–छात्राओं को अवगत कराने का कष्ट करेंगे।

टीप :– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

संलग्न : उपरोक्तानुसार।

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REVISED ORDINANCENO.11
(As per State U.G.C. Scheme)
BACHELOR OF ARTS

1. The three yearcourse has been broken up in to three Parts.
Part-I Examination: at the end ofthe first year.
Part-II Examination: at the end of the second year and
Part-III Examination:at the end of the third year.

2. A candidate who after passing (10+2) or intermediate exam-nation of C.G. Board of Secondary Education, C.G. oranyother examination recognized by the Universityor C.G. Board of Secondary Education asequivalent there to, has attended regular course of studyinan affiliated college orinthe Teaching Department of the University for one academic year shall be eligible for appearing atthe B.A. Part-I examination.

3. A candidate who after passing B.A. Part-I examination of the University or anyother examination recognized by the University as equivalent there to has attended regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part II Examination.

4. A candidate who after passing B.A.PartII examination of the University has completed a regular course of study for one academic year in anaffiliated college orin theTeaching Department of the University shall be eligible for appearing at the B.A. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students andnon-college at ecan did ates shall beeligible for admission other examination as per provisions of Ordinance N. 6 relating to Examinations (General). Provided that non- college ate can did at esshallbepermitted to offeronly suchsubjects/paper sasare taught to the regular students at any of the University Teaching Department orCollege.

6. Every candidate for the Bachelor of arts examination shall be examined in:

A Foundation Course:
(i) Group A -HindiLanguage
(ii) Group B - EnglishLanguage

B Three course subjects:One subject from any three group out ofthe followings six groups:
1 Sociology / Ancient Indian History/Anthropology
2 Political Science/Home Science / Drawing &Painting / VocationalCourse.
3 Hindi Literature/ Sanskrit Literature/Urdu Literature/Mathematics.
4 Economics/Music/DefenseStudies/Linguistics/ u``R;
5 Philosophy/Psychology/ Geography/ Education/Management.
6 History/English Literature/Statistics.
7 Practicals (If Nece ssary) for each coresubject.

7 Any candidate who has passed the B.A. examination of the University shall be allowed to present himself for examination in any of additional subject spres cribbed for the B.A. exami-nation and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.A. PartI examination in the subject which he proposes to offer and then the B.A.PartII and PartIII examinationin the same subject. Successfull candidate will be given acertificate to that effect.

8 Inorder to pass atany part of the three year degree course examination, an examinee must obtain not less than33% of the total makrs in each subject/group of subjects .In subject /group of subjects, where both theory and practical examination are provided, an examinee must pass in both the ory and practical part so the examination separately.

9 Candidate will have to pass separately at the Part-I, Part II and part-III examination. No division shall be assigned on the result of the Part-I and Part-II examination. In deter mining the divison of the Final examination, total marks obtained by the examinees, in their Part-I,Part-II and Part-III examination in the aggregate shall be taken in to account. Candidate will not be allowed to change subjects after passing Part IExamination.

Provided in case of candidate who has passed the examination through the supplementary examination having fail edin one subject only the total aggregate marks being carried over for determining the division shall in clued the actual mark so btained in the subject in which he appeared at the supplementary examination.

10 Successful exminee sat the Part-III examination obtaining 60% or more marks shall be placed in the First division, those obtain in gless than 60% but not less than 45% marks in the Second division and other successful examinees in the third division.

SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks	Min. Marks
	i) Environmental Studies		75	33
	Fild Work		25	
A.	Foundation Course			
	i) Hindi Language - I		75	26
	ii) English Language - II		75	26
B.	Three Core Subject :			
	1. Hindi Literature	I	75	50
		II	75	
	2. Sanskrit Literature	I	75	
		II	75	50
	3. English Literature	I	75	
		II	75	50
	4. Philosophy	I	75	
		II	75	50
	5. Economics	I	75	
		II	75	50
	6. Political Science	I	75	
		II	75	50
	7. History	I	75	50
		II	75	
	8. Ancient Indian History	I	75	50
	Culture & Archaeology	**II**	75	
	9. Sociology	I	75	50
		II	75	
	10. Geography	I	50	33
		II	50	
		Practical	50	17
	11. Mathematics	I	50	
		II	50	50
		III	50	
	12. Statistics	I	50	33
		II	50	
		Practical	50	17

	Subject	Paper	Max. Marks	Min. Marks
13.	Anthropology	I	50	33
		II	50	
		Practical	50	17
14.	Linguistics	I	75	50
		II	75	
15.	Music	I	50	33
		II	50	
		Practical	50	17
16.	Home Science	I	50	33
		II	50	
		Practical	50	17
17.	Education	I	75	50
		II	75	
18.	Psychology	I	50	33
		II	50	
		Practical	50	17
19.	Management	I	75	50
		II	75	
20.	Defence Studies	I	50	
		II	50	33
		Practical	50	17
21.	Urdu	I	75	50
		II	75	
22.	Dance	I	50	33
		II	50	
		Practical	50	17

Part - I

SYLLABUS FORENVIRONMENTAL STUDIES AND HUMAN RIGHTS

(Papercode-0828)

MM. 75

इन्वारमेंटल साईंसे के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओ ंमें विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है। स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न–पत्र उत्तीर्ण करना अनिवार्य है। तभी उपाधि प्रदाय योग्य होगी।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होंगे एवं 25 अंकक्षेत्रीय कार्य (Field Work) पर्यावरण पर होंगे।

सैद्धांतिक प्रश्नों पर अंक – 75 (सभी प्रश्न इकाई आधार पर रहेंगे जिसमें विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक
(ब) निबंधात्मक – 50 अंक

Field Work– 25 अंकों का मूल्यांकन आंतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा। अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं के समान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेंगे।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा के साथ किया जाएगा।

पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी। पर्यावरण विज्ञान के

सैद्धांतिक एवं फील्ड वर्क के संयुक्त रूप से 33ः (तैंतीस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे।

UNIT-I THE MULTI DISCIPLINARY NATUREOF ENVIRONMENTALSTUDIES

Definition, Scope and
Importance Natural Resources:
Renewable and Nonrenewable Resources

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction,mining, dams and their effects on forests and tribal people and relevant forestAct.

(b) Water resources: Use and over-utilization of surface and ground water, floodsdrought, conflicts over water, dam′s benefits and problems and relevantAct.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineralresources.

(d) food resources: World food problems, changes caused by agriculture andovergrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging ,salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energysources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

(12 Lecture)

UNIT-II ECOSYSTEM

(a) Concept, Structure and Function of andecosystem

- Producers, consumers and decomposers.
- Energy flow in theecosystem
- Ecologicalsuccession
- Food chains, food webs and ecologicalpyramids.
- Introduction, Types, Characteristics Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecosystem.

(b) Biodiversity and itsConservation

- Introduction - Definition: genetic. species and ecosystemdiversity
- Bio-geographical classification ofIndia.
- Value of biodiversity: Consumptive use. productive use, social ethics, aesthetic and optionvalues.
- Biodiversity at global, National and locallevels.
- India as mega-diversitynation.
- Hot spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild lifeconflict.
- Endangered and endemic species ofIndia.
- Conservation of biodiversity: In situ and Ex-situ conservation ofbiodiversity.

(12Lecture)

UNIT- III

(a) Causes, effect and control measuresof

- Air water, soil, marine, noise, nuclear pollution and Humanpopulation.
- Solid waste management: Causes, effects and control measures of urban and industrialwastes.
- Role of an individual in prevention ofpollution.
- Disaster Management: floods, earthquake, cyclone andlandslides.

(12Lecture)

(b) EnvironmentalManagement

- From Unsustainable to sustainabledevelopment.
- Urban problems related toenergy.
- Water conservation, rain water harvesting, watershedmanagement.
- Resettlement and rehabilitation of people, its problems andconcerns.
- Environmental ethics: Issues and possiblesolutions.
- Climate change, global warming, acid rain, ozone layer depletion,nuclear accidents andholocaust.
- Wastelandreclamation
- Environment protection Act: Issues involved in enforcement of environmental legislation.
- Role of Information Technology in Environment and HumanHealth.

UNIT- IV

General background and historical perspective- Historical development and concept of Human Rights, Meaning and definition of Human Rights, Kind and Classification of Human Rights.
Protection of Human Rights under the UNO Charter, protection of Human Rights under the Universal Declaration of Human Rights, 1948.
Convention on the Elimination of all forms of Discrimination against women.
Convention on the Rights of the Child, 1989.

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution of India, Directive Principles of State policy under the Constitution of India, Enforcement of Human Rights in India.

Protection of Human Rights under the Human Rights Act, 1993- National Human Rights Commission, State Human Rights Commission and Human Rights court in India.Fundamental Duties under the Constitution of India.

Reference/ Books Recommended

1. SK Kapoor- Human rights under International Law and IndianLaw.
2. HO Agrawal- Internation Law and HumanRights
3. एस.के. कपूर –मानव अधिकार
4. जे.एन. पान्डेय – भारत का संविधान
5. एम.डी. चतुर्वेदी – भारत का संविधान
6. J.N.Pandey - Constitutional Law ofIndia
7. Agarwal K.C. 2001 Environmental Biology, Nidi pub. Ltd.Bikaner
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27. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science publication (TB)
28. Wanger K.D.1998, Environmental Management. W.B. Saunders Co. Philadelphia,USA 499p

संशोधित पाठ्यक्रम

बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.

भाग – एक (आधार पाठ्यक्रम)

प्रश्न पत्र– प्रथम (हिन्दी भाषा)

(पेपर कोड –0101) पूर्णांक– 75

नोट :–

1. प्रश्न पत्र 75 अंक का होगा।
2. प्रश्न पत्र अनिवार्य होगा ।
3. इसके अंक श्रेणी निर्धारण के लिए जोड़े जायेंगे।
4. प्रत्येक इकाई के अंक समान होंगे।

पाठ्य विषय :–

इकाई–1

क. पल्लवन, पत्राचार, अनुवाद, पारिभाषिक शब्दावली एवं हिंदी में पदनाम

ख. ईदगाह (कहानी) – मुंशी प्रेमचंद

इकाई–2

क. शब्द शुद्धि, वाक्य शुद्धि, शब्द ज्ञान–पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी शब्द, समश्रुत शब्द, अनेक शब्दों के लिए एक शब्द एवं मुहावरे–लोकोक्तियाँ

ख. भारत वंदना (कविता)– सूर्यकान्त त्रिपाठी निराला

इकाई–3

क. देवनागरी लिपि – नामकरण, स्वरूप एवं देवनागरी लिपि की विशेषताएँ, हिंदी अपठित गद्यांश, संक्षेपण, हिंदी में संक्षिप्तीकरण

ख. भोलाराम का जीव (व्यंग्य) – हरिशंकर परसाई

इकाई–4

क. कम्प्यूटर का परिचय एवं कम्प्यूटर में हिंदी का अनुप्रयोग

ख. शिकागो से स्वामी विवेकानंद का पत्र

इकाई–5

क. मानक हिन्दी भाषा का अर्थ, स्वरूप, विशेषताएँ, मानक, उपमानक, अमानक भाषा

ख. सामाजिक गतिशीलता – प्राचीन काल, मध्यकाल, आधुनिक काल

मूल्यांकन योजना :–

प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 होंगे। प्रश्न–पत्र का पूर्णांक 75 निर्धारित है।

पाठ्यक्रम संशोधन का औचित्य :–

व्याकरण के बुनियादी ज्ञान, संप्रेषण, कौशल, सामाजिक संदेश एवं भाषायी दक्षता को ध्यान में रखते हुए यह पाठ्यक्रम प्रस्तावित है।

FOUNDATION COURSE

PAPER - II

ENGLISH LANGUAGE (Paper Code-0102) M.M. 75

UNIT-1 **Basic Language skills : Grammar and Usage.**

Grammar and Vocabulary based on the prescribed text. To be assessed by objective / multiple choice tests.

(Grammar - 20 Marks
Vocabulary - 15 Marks)

UNIT-2 **Comprehension of an unseen passage.** 05

This should simply not only (a) an understanding of the passage in question, but also

(b) a grasp of general language skills and issues with reference to words and usage

within the passage and (c) the Power of short independent composition based on themes and issues raised in the passage.

To be assessed by both objective multiple choice and short answer type tests.

UNIT-3 **Composition :** Paragraph writing 10

UNIT-4 **Letter writing** (The formal and one Informal) **10**

Two letters to be attempted of 5 marks each. One formal and one informal.

UNIT-5 Texts : **15**

Short prose pieces (Fiction and not fiction) short poems, the pieces should cover a range of authors, subjects and contexts. With poetry if may sometimes be advisable to include pieces from earlier periods, which are often simpler than modern examples. In all cases, the language should be accessible (with a minimum of explanation and reference to standard dictionaries) to the general body of students schooled in the medium of an Indian language.

Students should be able to grasp the contents of each place; explain specific words, phrases and allusions; and comment on general points of narrative or argument. Formal Principles of Literary criticism should not be taken up at this stage.

To be assessed by five short answers of three marks each.

BOOKS PRESCRIBED -

English Language and Indian Culture - Published by M.P. Hindi Grant Academy Bhopal.

Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

संशोधित पाठ्यक्रम

बी. ए. भाग–1

हिन्दी साहित्य

प्रथम– प्रश्न पत्र

(प्राचीन हिन्दी काव्य) पूर्णांक 75

(पेपर कोड– 0103)

उद्देश्य एवं प्रस्तावना–

प्राचीन से तात्पर्य है– आधुनिक काल से पूर्व का काल। सही अर्थ में हिन्दी भाषा और साहित्य का विकास आदिकाल से शुरू होता है। इसमें धार्मिक तथा ऐतिहासिक दो प्रकार का साहित्य मिलता है, जो प्रबंध, मुत्तक, रासो, फागु, चरित, सुभाषित आदि विविध काव्यरूपों में अभिव्यंजित है। मध्यकालीन साहित्य की पृष्ठभूमि के रूप में इसे प्रतिष्ठापित किया जाता है।

मध्यकालीन काव्य में भक्तिकाव्य, जहां लोक जागरण को स्वर देने वाला है, वहीं रीतिकाल अपने लौकिक– श्रृंगारिका, परिदृश्य में तत्कालीन सामाजिक, सांस्कृतिक, राजनीतिक स्थितियों को बेलौस अभिव्यंजित करता है। अतः भाषा, संस्कृति, विचार, मानवता, काव्यरूपता, लौकिकत– पारलौकिकता, आदि दृष्टियों से इसका अध्ययन अत्यावश्यक है।

पाठ्य विषय–

1. कबीर (कबीर– कांतिकुमार जैन, प्रारंभिक 50 साखियाँ)
2. जायसी– (संक्षिप्त पद्मावत– श्यामसुंदर दास, नागमती वियोग वर्णन)
3. सूर (भ्रमर गीत सार– सं. आचार्य रामचन्द्र शुक्ल, प्रारंभिक 25 पद)
4. तुलसी – "रामचरित मानस" के सुंदरकाण्ड से प्रारंभिक 30 दोहे चौपाई छंद साहिंत
5. घनानन्द (घनानन्द– सं. विश्वनाथ प्रसाद मिश्र, प्रारंभिक 25 छंद)

द्रुत पाठ हेतु निम्नांकित तीन कवियों का अध्ययन किया जावेगा– जिसमें से किन्हीं दो पर लघुउत्तरीय प्रश्न पूछे जायेंगे–

1. विद्यापति
2. रहीम
3. रसखान

अंक विभाजन–

1. व्याख्याएँ (3) – 21 अंक
2. आलोचनात्मक प्रश्न (2) – 24 अंक
3. लघुउत्तरीय प्रश्न (5) – 15 अंक
4. वस्तुनिष्ठ प्रश्न (15) – 15 अंक

संशोधित

बी. ए. भाग–1

हिन्दी साहित्य

द्वितीय– प्रश्न पत्र

हिन्दी कथा साहित्य पूर्णांक 75

(पेपर कोड– 0104)

उद्देश्य एवं प्रस्तावना–

गद्य की प्रमुख विधाओं का इतना द्रुत विकास इनकी लोकप्रियता का प्रमाण प्रस्तुत करता है। इसमें आधुनिक जीवन, ,अपनी विविध कमियों के साथ यथार्थ रूप में अभिव्यंजित हुआ है। जीवन की अनुभूतियाँ, संवेदनाओं तथा विविध परिस्थितियों के साक्षात्कार के लिए इनका अध्ययन सर्वथा अपेक्षित है।

पाठ्य विषय–

व्याख्या एवं आालोचनात्मक प्रश्नों के लिए एक उपन्यास एवं आठ कहानीकारों की एक– एक प्रतिनिधि कहानी का अध्ययन आवश्यक है।

उपन्यास 1. प्रेमचंद – गबन

कहानी
1. प्रेमचंद – कफन
2. जयशंकर प्रसाद – आकाश दीप
3. यशपाल – परदा
4. फणीश्वनाथ रेणु – ठेस
5. मोहन राकेश – मलबे का मालिक
6. भीष्म साहनी – चीफ की दावत
7. गुलशेर खाँ शानी – जली हुई रस्सी
8. रांगेय राघव – गदल

द्रुत पाठ के लिए निम्नांकित तीन कथाकारों का अध्ययन अपेक्षित है, जिनमें से किन्हीं दो पर लघुउत्तरीय प्रश्न पूछे जावेंगे–

1. उपेन्द्रनाथ अश्क, 2. बाल शौरि रेड्डी 3. शिवानी

अंक विभाजन– व्याख्या (3) 21 अंक
आलोचनात्मक प्रश्न (2) 24 अंक
लघुउत्तरीय प्रश्न (5) 15 अंक
वस्तुनिष्ठ प्रश्न (15) 15 अंक

B.A. Part-I

ENGLISH LITERATURE

There will be two literatures in English-1550-1750 Papers, each carrying

Maximum marks-75.

Nine questions are to be attempted in each peper.Each question carries the marks according to the scheme mentloned in each paper.

ENGLISH LITERATURE

PAPER - I

LITERATURE IN ENGLISH - 1550-1750 (Paper Code-0105) M.M.75

(i) Unit-1of annotation is compulsery,and passages to be set fromUnits(II toV), atleast one from each unit, 3to be attempted.

3x5 =15

(ii) Multiplechoice/objective type questions to beset unit vii,15 to be set10 be attempted.

1x1 =10

(iii) FromUnit-II toVI-8 questions to be setatleast one from each unit-5 to be attempted.

10x5 =50

Word Limit for each answer 300 to 400 words.

UNIT-1 ANNOTATIONS.

UNIT-2 POETRY

a) Shakespeare-SonnetNo.1FromFairestCreatures,SonnetNo.154.,Thelittle LoveGod.
b) Milton-HowSoonHathTimetheSubtleTheifofYouth...
c) John Donne - Sweetest Love I Don't go, Thisis my play's LastScene.

UNIT-3 POETRY

a) John Dryden - Portrait of Shadwell.
b) Alexander-Pope-FromAnEssyonCriticism(Truecaseinwriting....)and the world's Victor Stood subdned bysound.

UNIT-4 PROSE

a) Bacon OfStudies, Of Health, OfFriendship
b) Addison-Sir Roger atHome
c) Steele OftheClub.

UNIT-5 DRAMA

Shake spear - The Merchant of Venice

UNIT-6 Fiction - Swift - The Battle of the Books.

UNIT-7 Historicaland LiteraryTopics

i. The Renaissance.
ii. Humanism.
iii. Reformation.
iv. TheRestoration.
v. The EarlierDrama
vi. Petrachism and the SonnetCycle.
vii. The Influence of Seneca and Classical DramaticTheory
viii. The Elizabethan and Jacobeanstage.
ix. RestorationDrama
x. The Rise of PeriodcalEssay

BOOKS RECOMMENDED for Unit VII in Papers I and II

EdwardAlbert	-	A History of EnglishLiterature.
IforEvans	-	A shortHistory of EnglishLiterature.
Hudson	-	An Outline History of EnglishLiterature.

Both the papers of B.A.Part-I are included in the anthologies prescribed in the previous syllabus for B.A.Part-I and B.A.Part-II

Dr. M. Chakraborty DR. S Gupta DR. MERILY ROY

ENGLISH LITERATURE
PAPER - II
LITERATURE IN ENGLISH FROM 1750-1900 (Paper Code-0106)

Note-

i. Unit-1.ofannotationiscompulsory,6passagesbesetfromUnits(IItoIV)atleast one from each unit, 3 tobeattempted. 3x5 =15

ii. MultipleChoice/objectivetypequestionstobesetfromunit-VII,25tobeset10 tobeattempted. 1x10 =10

iii. FromUnits11toVI-8questions to beset atleast one from each Unit-5to be attempted. 10x5 =50

Word Limit for each answer 300 to 400 words.

UNIT-1 ANNOTATIONS

UNIT-2 POETRY -

a) Blake-Tiger,TigerBurningBright.
b) Wordsworth - Daffodils and SolitaryReaper.
c) Coleridge-FrostatMidnight.

UNIT-3 POETRY-

a) Shelley - Ode to askylark.
b) Keats - Ode toAutumn.
c) Tennyson - Crossing theBar.
d) Browing -Prospice.

UNIT-4 PROSE

a) Lamb - Dream Children : AReverie
b) Hazlit - On Actors andActing

UNIT-5 Fiction Jane Austen - Pride and prejudice.

UNIT-6 Fiction Charles Dickens - David Copperfield

UNIT-7 Historicaland LiteraryTopics.

i. The ReformActs.
ii. The Impact of Industrialization.
iii. Colonialism AndImperialism.
iv. Scientific the ughts anddiscoveries.
v. Faith andDoubt.
vi. Classical and Romantic Concepts ofImagination.
vii. Varieties of Romantic and VictorianPoetry.
viii. The VictorianNovel.
ix. Realism and theNovel.
x. Aestlheticism.

Dr. M. Chakraborty DR. MERILY ROY

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

B.A. – I

P S Y C H O L O G Y

Paper	Name of the Paper	Max. Marks	Duration
I	Basic Psychological Processes	50	3 hrs.
II.	Psychopathology	50	3 hrs.
III.	Practicum	50	4 Hrs.

PAPER - I

BASIC PSYCHOLOGICAL PROCESSES (Paper Code-0119) **M.M.:50**

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Introduction: Definition and Goals of Psychology; Behaviouristic, Cognitive and Humanistic; Cross-cultural Perspectives. Methods: Experimental, Observational, Interview, Questionnaire, and Case study.

UNIT-2 Biological Basis of Behaviour: Genes and Behaviour, The Nervous System: The Central Nervous System (C.N.S.), The Autonomic Nervous System (A.N.S.) and The Peripheral Nervous System (P.N.S.); Glands and Hormones; Emotions- Types and Bodily changes (internal and external).

UNIT-3 Sensory and Perceptual Processes: Nature and Types of Sensation, Perception and Attention: Process, Definition, Types and Determinants; Principles of Perceptual Organization; Illusion: Nature and Types.

UNIT-4 Learning and Memory: Classical and Operant Conditioning- Basic Processes; Verbal and Observational Learning; Memory: Sensory (S.M.), Short-term (S.T.M.) and Long-term (L.T.M.); Forgetting: Process and Theories.

UNIT-5 Cognitive and Non-Cognitive Processes: Intelligence: Nature and Types; Motivation: Biogenic and Sociogenic Motives; Thinking Process: Nature and Types. Personality: Nature and Determinants; Approaches to study Personality: Trait and Type Approaches; Assessment of Personality.

References

1. सिंह अरूण कुमार सामान्य मनोविज्ञान। मोतीलाल बनारसीदास
2. वर्मा, आधुनिक, सामान्य मनोविज्ञान।
3. Baron, R.A. & Byrne, D.A. Understanding Behavior. Tokyo: Halt Sounders.
4. Zimbardo, P.G. Psychology. New York: Haper Collings College publishers.
5. Lefton, L. A. (1985). Psychology. Bosten-Allyn Publishers.
6. Walser, A.L. (1997).

22.6.19

22.06.2019

B.A. – I

P S Y C H O L O G Y

PAPER- II

PSYCHOPATHOLOGY (Paper Code-0120) **M.M.:50**

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Introduction: The concept of Normality and Abnormality; Models of Psychopathology: Psychodynamic, Behavioral and Cognitive.

UNIT-2 Assessment of Psychopathology: Diagnostic Tests, Rating Scales, Clinical Interview, and Projective Tests.

UNIT-3 Anxiety Disorders: Panic Disorder, Phobias, Obsessive Compulsive Disorder (OCD), and Generalized Anxiety Disorder (GAD).

UNIT-4 Mood Disorders: Manic-Depressive Episode and Dysthemia; Personality Disorders: Paranoid, Schizoid, and Dependent Personality Disorder, Dissociative disorder and Obesity.

UNIT-5 Management of Psychopathology: Stress Management; Medico and Psychosocial Therapy: Shock Therapy, Psychoanalysis, Group therapy and Behavior therapy.

References

1. Lamm, A. (1997). Introduction to Psychopathology. NY: Sage.
2. Buss, A. H. (1999). Psychopathology. NY: John Wiley.
3. सिंह तथा तिवारी। असामान्य मनोविज्ञान। आगरा विनोद पुस्तक मंदिर।
4. कपिल, एच. के.। असामान्य मनोविज्ञान। आगरा। हरप्रसाद भार्गव।

22.6.19

22.06.2019

B.A. – I

P S Y C H O L O G Y

PAPER- III

PRACTICUM **M.M.:50**

Note: This paper consists of two parts:

Part-A

(a) Comprises of Laboratory **Experiments**.
(b) Comprises of Psychological **Testing** and understanding of self and others.

(a) **Experiments-** (Any five of the following) :-

(i) Effect of Set on Perception
(ii) Effect of Frustration on Performance.
(iii) Division of Attention.
(iv) Learning Curve/ Serial Position Curve.
(v) Retroactive Inhibition (RI).
(vi) S.T.M.
(vii) Concept Formation.
(vii) Judgment of Emotions through Facial Expressions.
(ix) Personality Test

(b) **Psychological Tests** (Any four of the following)

(i) Verbal/ Nonverbal Intelligence Test/ Performance Tests.
(ii) E.P.I./ Personality (iii) Anxiety test.
(iv) Depression Scale (v) Adjustment Inventory.
(vi) Achievement motivation. (vii) Stress Tolerance Test.

Part-B

Anecdotal Record: Each student will be required to observe the behaviour of pupil in different setting and select an anecdote to understand, judge and narrate it as objectively as possible, so as to reveal his/her psychological insight existing in that anecdotal behavior. This record constitutes a part of psychological assessment of the students. Introduction to the measures of central tendency and graphical presentation of the ungrouped data.

Distribution of Marks

A.	Conduction of Psychological Experiment and Reporting	-	15 Marks
B.	Administration of one Psychological Test and Reporting	-	15 Marks
C.	Evaluation of Practical notebook and Anecdotal record	-	10 Marks
D.	Viva-voce	-	10 Marks

Note : No candidate will be allowed to appear in the practical examination unless his/her day-to-day practical work and the report are found satisfactory.

References Choubey, A. (2015). Psycho-lab- Experiment and Test. Raipur: Vaibhav Prak

22.6.19

22.06.2019

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. प्रथम वर्ष

इतिहास

प्रश्न पत्र –प्रथम

भारत का इतिहास, प्रारंभ से 1206 ई. तक

इकाई–1

1. भारत की भौगोलिक संरचना
2. भारतीय इतिहास के स्त्रोतों का सर्वेक्षण
3. पूर्ण पाषाण काल एवं उत्तर पाषाण काल
4. हड़प्पा सभ्यता– निर्माता, प्रसार, नगर योजना, राजनीतिक, सामाजिक, आर्थिक संरचना

इकाई–2

5. ऋग्वैदिक काल – राजनीतिक, सामाजिक, आर्थिक
6. ईसा पूर्व छठवी शताब्दी का भारत –महाजनपद काल
7. जैन एवं बौद्ध धर्म
8. सिंकदर का आक्रमण और उसका प्रभाव

इकाई–3

9. चंद्रगुप्त मौर्य एवं अशोक
10. मौर्य प्रशासन, कला एवं संस्कृति, अशोक का धम्म
11. मौर्योत्तरकाल – शुंग, कुषाण एवं सातवाहन
12. संगमयुग– साहित्य, संस्कृति, चोल एवं पाण्ड्य

इकाई–4

13. गुप्तयुग– समुद्रगुप्त की विजयें एवं चंद्रगुप्त द्वितीय, प्रशासन, आर्थिक, सामाजिक, सांस्कृतिक दशा
14. राजपूतों की उत्पत्ति एवं प्रशासनिक तथा सामाजिक विशेषताएं
15. पल्लव, चालुक्य, वर्धन, पाल, राष्ट्रकुट
16 भारत का दक्षिण पूर्व एशिया एवं श्रीलंका से संबंध
17. मोहम्मद बिन कासिम, महमूद गजनवी एवं मुहम्मद गोरी का आक्रमण

इकाई–5

18. छत्तीसगढ़ का परिचय– नामकरण एवं भौगोलिक स्थिति
19. छत्तीसगढ़ के प्रमुख क्षेत्रीय राजवंश–पाण्डुवंश, शरभपुरीय,
20. छत्तीसगढ़ के प्रमुख राजवंश– नलवंश, छिन्दक नागवंश,
21. दक्षिण कोसल के कल्चुरी वंश, राजनीतिक एवं प्रशासनिक व्यवस्था

संदर्भ ग्रन्थ सूचीः–

1. रतिभानु सिंह नाहर — प्राचीन भारतीय इतिहास एवं संस्कृति
2. शांता शुक्ला — भारत का राजनीतिक इतिहास
3. द्विजेन्द्र नारायण एवं श्रीमाली — प्राचीन भारत
4. ओम प्रकाश — प्राचीन भारत
5. बी.एन. लूनिया — प्राचीन भारतीय संस्कृति
6. एस.आर. शर्मा — प्राचीन भारत– प्रगैतिहासिक युग से 1200 ई. तक
7. K.L. Khurana — Ancient India from Earliest Time to 1206 A.D.
8. K.L. Khurana — History of India from Earliest Time to 1526 A.D
9. Vincent Smith — Oxford History of India
10. भार्गव — प्राचीन भारत
11. L. Prasad — Ancient India- Indius Volley Civilization to 1200 A.D
12. भगवान सिंह वर्मा — छत्तीसगढ़ का इतिहास प्रारंभ से 1947ई. तक
13. राम कुमार बेहार — छत्तीसगढ़ का इतिहास
14. ऋषिराज पांडे — दक्षिण कौशल के कल्चुरी
15. व्ही.व्ही. मिराशी — कल्चुरी नरेश और उनका काल
16. सुरेश चंद्र शुक्ला — छत्तीसगढ़ का समग्र अध्ययन
17. किशोर अग्रवाल — बीसवीं शताब्दी का छत्तीसगढ
18. सुरेश चंद्र शुक्ला अर्चना शुक्ला — छत्तीसगढ की रियासतों का विलीनीकरण एवं
19. लाला जगदलपुरी — बस्तर इतिहास एवं संस्कृति
20. प्यारेलाल गुप्त — प्राचीन छत्तीसगढ
21. सी.एल. शर्मा — छत्तीसगढ की रियासतें
22. हीरालाल शुक्ल — छत्तीसगढ का जनजातीय इतिहास
23. पी.एल. मिश्र — मुगलकालीन छत्तीसगढ़

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. प्रथम वर्ष
इतिहास
प्रश्न पत्र – द्वितीय
विश्व का इतिहास–1453 ई. से 1890 ई. तक

इकाई–1

1. यूरोप में आधुनिक युग की विशेषतायें, पुनर्जागरण
2. धर्म सुधार एवं प्रति धर्म सुधार आंदोलन
3. राष्ट्रीय राज्यों का उदय स्पेन, फ्रांस
4. राष्ट्रीय राज्यों का उदय इंग्लैण्ड, रूस

इकाई–2

1. वाणिज्यवाद, उपनिवेशवाद
2. औद्योगिक क्रान्ति
3. इग्लैण्ड में गृह युद्ध : घटनाएँ, कारण एवं परिणाम
4. गौरव पूर्ण क्रांति (1688)

इकाई–3

1. अमेरिका का स्वतंत्रता संग्राम
2. फ्रांस की क्रान्ति के कारण एवं प्रभाव
3. नेपोलियन युग
4. विएना कांग्रेस

इकाई–4

1. अनुदारवाद– मैटरनिक, आंतरिक एवं विदेश नीति
2. यूरोप में 1830 ई. एवं 1848 ई. की क्रान्ति
3. इंग्लैण्ड में उदारवाद 1832 एवं 1867 ई. का सुधार अधिनियम
4. पूर्वी समस्या– कारण, क्रीमिया युद्ध, बर्लिन सम्मेलन

इकाई–5

1. इटली का एकीकरण
2. जर्मनी का एकीकरण
3. बिस्मार्क की गृह नीति
4. बिस्मार्क की विदेश नीति

संदर्भ ग्रन्थ सूचीः–

- बी. एन. मेहता — अर्वाचीन यूरोप
- K.L. Khurana — History of Modern World
- Khurana And Sharma — Modern Europe 1453- 1789 A.D.
- जैन एवं माथुर — आधुनिक विश्व
- कौलेश्वर राय — आधुनिक यूरोप
- मथुरा लाल शर्मा — संयुक्त राज्य अमेरिका का इतिहास
- वी.एस. माथुर — संयुक्त राज्य अमेरिका का इतिहास
- बी.एन. लूणिया — आधुनिक पाश्चात्य इतिहास की प्रमुख धाराएं
- एल.पी. शर्मा — इंग्लैंड का इतिहास
  वी.डी. महाजन — इंग्लैंड का इतिहास
- जे.आर. काम्बले — अमेरिका का इतिहास
  A.C. Gupta — A History of China
- विपिन बिहारी सिन्हा — आधुनिक ग्रेटब्रिटेन

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS
B. A. Part- I (Economics)
Subject : Micro Economics, Paper-I (Code: 0111)

UNIT 1

Introduction - Definitions Nature and scope of Economics, Methodology in Economics, Utility - Cardinal and Ordinal approaches, Indifference curve, Consumer's equilibrium, Giffin goods, Demand - Law of Demand, Elasticity of demand Consumer's surplus

UNIT 2

Theory of production and cost, Production decision, Production function, Iso-quant, Factor substitution, Law of variable proportions, Returns to scale, Economies of scale, Different concepts of cost and their interrelation, Equilibrium of the firm.

UNIT 3

Market structure-perfect and imperfect markets, Equilibrium of a firm-Perfect competition, Monopoly and price discrimination, Monopolistic competition, Duopoly, Oligopoly, controlled and administered prices

UNIT 4

Factor pricing-Marginal productivity theory of distribution, Euler's theorem, Theories of wage determination, wages and collective bargaining, wage differentials, Rent - Scarcity Rent, differential rent, Quasi rent, Modern Rent Theory, Interest Classical and Keynesian Theories, Modern Theory, Profits - Innovation, Risk bearing and uncertainty theories

UNIT 5

Welfare economics: , What welfare economics is about ?, Role of value judgments in welfare economics, Pigou's contribution in the field of welfare economics, Concept and condition of Pareto optimality, New welfare economics: Kaldor-Hicks welfare criterion, Scitovsky paradox, Social welfare function and social choice: Bergson-

26/6/19

Samuelson social welfare function, Prof. Amartya Sen's critique, Arrow impossibility theorem.

References:

1. Bach, G. L. (1977) "Economics, " Prentice Hall of India, New Delhi.
2. Gauld, J.P. and Edward P. L. (1996), "Microeconomic Theory," Richard lrwin, Homewood.
3. Henderson J. and R. E. Quandt (1980), "Microeconomic Theory : A Mathematical Approach", McGraw Hill, New Delhi.
4. Heathfield and Wibe (1987), " An Introduction to Cost and Production Functions", Macmillan. London.
5. Koutsoyiannis, A. (1990), " Modern Microeconomics" , Macmillan.
6. Lipsey, R. G. and K. A. Chrystal (1999) "Principles of Economics ", (9th Edition), Oxford University Press, Oxford. B.A.-Part-I (21) P

26/6/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS
B. A. Part- I (Economics)
Subject : Indian Economy , Paper-II (Code: 0112)

UNIT 1

Pre and post independent Indian economy: A short introduction of economic policies of British India, State of economy at the time of independence, Planning exercise in India-Planning in India through different five Year Plans, The planning commission and NITI Aayog, Growth and development in pre-reform period, New Economic Reforms: Liberalization, Privatization and Globalization, Growth, development and structural change in post-reform period.

UNIT 2

Population and human development: Demographic trends and issues of education, health, malnutrition and migration. Growth and distribution: Trends and policies in poverty, inequality, unemployment and occupational distribution, International comparison in human development and poverty reduction

UNIT 3

Agriculture: Nature and importance, Trends in agriculture production and productivity, factors determining productivity, Land reforms, new agriculture strategies and green revolution, rural credit, Agricultural marketing, natural resources and infra-structure development: Performance, problems and policies, MUDRA Yojana.

UNIT 4

Industry: Growth and productivity, Industrial policy and reforms, Growth and problems of small and cottage scale industries, Role of public sector enterprises in India's industrialization. Trends and performance in services.

UNIT 5

External Sector - Role of foreign trade, Trends in exports and imports, Composition and direction of India's foreign trade, Export promotion measures and the new

26/6/19

trade policies, Recent macroeconomic scenario: National Income, investment, saving and inflation, Current macroeconomic policies and their impact, fiscal policies and monetary policy.

References

1. Uma Kapila “Indian Economy: Performance and Policies,” published by Academic Foundation.
2. Dutta and Sundram, “Indian Economy’, S. Chand Publications.
3. Mishra and Puri, “Indian Economy,” Himalaya Publishing House.
4. Economic Survey of India: various Issues, Published by Government of India.

26/6/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

नवीन संशोधित पाठ्यक्रम
सत्र 2019–20
दर्शन शास्त्र
बी.ए. भाग–एक, दर्शन शास्त्र में दो प्रश्न पत्र (75 अंक) के होंगे।

1. भारतीय दर्शन की रूपरेखा
2. पाश्चात्य दर्शन का इतिहास

प्रत्येक प्रश्न पत्र पांच इकाईयों में विभाजित है । प्रत्येक इकाई में से एक प्रश्न हल करना अनिवार्य होगा ।

बी.ए. भाग – एक
दर्शन शास्त्र
प्रथम – प्रश्न पत्र

भारतीय दर्शन की रूपरेखा

इकाई–1
1. भारतीय दर्शन – परिचय एवं मुख्य विशेषताएं
2. वेद एवं उपनिषद– ब्रह्म , आत्मा
3. चार्वाक दर्शन – तत्व मीमांसा

इकाई–2
1. जैन दर्शन – स्याद्वाद, जीव, बंधन एवं मोक्ष
2. बौद्ध दर्शन– चार आर्यसत्य, अनात्मवाद

इकाई–3
1. न्याय दर्शन – प्रमाण (प्रत्यक्ष एवं अनुमान), ईश्वर
2. वैशेषिक दर्शन– परमाणुवाद, सप्त पदार्थ

इकाई–4
1. सांख्य दर्शन – प्रकृति , पुरूष, विकासवाद
2. योग दर्शन – अष्टांग योग, ईश्वर

इकाई–5
1. शंकराचार्य का अद्वैत दर्शन– ब्रह्म, आत्मा, माया
2. रामानुज का विशिष्टाद्वैत – ब्रह्म, जीव, मोक्ष

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।

HSA
29/6/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

नवीन संशोधित पाठ्यक्रम

बी.ए. भाग – एक

दर्शन शास्त्र

द्वितीय – प्रश्न पत्र

पाश्चात्य दर्शन का इतिहास

इकाई–1 1. पाश्चात्य दर्शन – परिचय

2. प्लेटो– प्रत्ययों का सिद्धांत

3. अरस्तू– कारणता का सिद्धांत

इकाई–2 1. थामस एक्वीनास– ईश्वर के अस्तित्व के प्रमाण

2. डेकार्ट– संदेह पद्धति, आत्मा का अस्तित्व, ईश्वर का अस्तित्व

इकाई 3. 1. स्पिनोजा – द्रव्य, गुण, पर्याय

2. लाइबनित्ज– चिद्बिन्दुवाद

इकाई–4 1. जॉन लॉक– सहज प्रत्ययों का खंडन, मूलगुण एवं उपगुण

2. जॉन बर्कले – मूलगुण एवं उपगुण का खंडन, विज्ञानवाद

इकाई–5 1. ह्यूम– संस्कार और प्रत्यय, संदेहवाद, आत्मा का खंडन

2. कांट – समीक्षावाद

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।

HSA
29/6/19

बी.ए. प्रथम वर्ष

संस्कृत साहित्य

प्रथम प्रश्नपत्र

टीप – बी.ए. प्रथम वर्ष में संस्कृत साहित्य के दो प्रश्न–पत्र होंगें एवं दोनों प्रश्न –पत्र 75– 75 अंकों के होंगें ।

नाटक, व्याकरण और अनुवाद पूर्णांक – 75

इकाई –1	स्वप्नवासवदत्तम् – व्याख्या	अंक – 15
इकाई –2	स्वप्नवासवदत्तम् – समीक्षात्मक प्रश्न	अंक – 15
इकाई –3	1. सुबन्त (शब्दरूप) – राम, मुनि, भानु, पितृ, करिन्, कर्तृ, आत्मन्, लता, मति, नदी, धेनु, मातृ, फल, वारि, सर्व, तद्, एतद्, यद्, इदम्, अस्मद्, युष्मद् । 2. तिङन्त (धातुरूप) – भ्वादि, दिवादि, तुदादि, चुरादि गण के अतिरिक्त अस् एवं कृ धातुओं के लट्, लृट्, लङ्, लोट् एवं विधिलिङ् लकारों के रूप 3. अपठित गद्यांश पर आधारित प्रश्न	अंक – 15

नोट– शब्द रूप एवं धातु रूप के विकल्प के रूप में अपठित गद्यांश पर आधारित प्रश्न भी पूछे जा सकते है ।

इकाई –4	प्रत्याहार, संज्ञा, सन्धि और विभक्त्यर्थ	अंक – 15
इकाई –5	हिन्दी से संस्कृत में अनुवाद	अंक – 15

अनुशंसित ग्रन्थ –

1. रचनानुवाद कौमुदी – डा. कपिलदेव द्विवेदी
2. संस्कृतस्य व्यावहारिकस्वरूपम् – डा. नरेन्द्र, श्री अरविन्द आश्रम
3. संस्कृतव्याकरण – श्रीधर वसिष्ठ
4. संस्कृत में अनुवाद कैसे करें – उमाकान्त मिश्र शास्त्री, प्रकाशक – भारती भवन
5. लघु सिद्धान्त कौमुदी – श्री महेश सिंह कुशवाहा, प्रकाशक – चौखम्बा विद्याभवन, वाराणसी

31/05/19

बी.ए. प्रथम वर्ष

संस्कृत साहित्य

द्वितीय प्रश्नपत्र

गद्य, कथा एवं साहित्येतिहास पूर्णांक – 75

इकाई –1	शुकनासोपदेशः – व्याख्या	अंक – 15
इकाई –2	हितोपदेशः (मित्रलाभः) – व्याख्या	अंक – 15
इकाई –3	शुकनासोपदेश एवं हितोपदेश के समीक्षात्मक प्रश्न	अंक – 15
इकाई –4	वैदिक एवं पौराणिक साहित्य का सामान्य परिचय (वेद, ब्राह्मण, आरण्यक, उपनिषद्, वेदांगों एवं पुराणों का संक्षिप्त परिचय)	अंक – 15
इकाई –5	निम्नलिखित कवियों का परिचय – महाकवि कालिदास, भारवि, माघ, श्रीहर्ष, विशाखदत्त, बाणभट्ट, शूद्रक, विशाखदत्त, भवभूति ।	अंक – 15

अनुशंसित ग्रन्थ –

1. शुकनासोपदेश – प्रकाशक – मोतीलाल बनारसीदास, वाराणसी
2. हितोपदेश (मित्रलाभ) – प्रकाशक – मोतीलाल बनारसीदास, वाराणसी
3. वैदिक साहित्य और संस्कृति – आचार्य बलदेव उपाध्याय
4. संस्कृत साहित्य का इतिहास – आचार्य बलदेव उपाध्याय
5. संस्कृत साहित्य का अभिनव इतिहास – डा. राधावल्लभ त्रिपाठी, वि.वि. प्रकाशन, सागर, म.प्र.

31/05/19

Syllabus of Geography

(B.A./B. Sc. I Year)

Session

2019-2020
2020-2021

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Chandra

Brief Summary

3 Year Integrated UG Courses (B.A./ B.Sc.) in Geography

B.A. /B.Sc. Part I

The B.A. /B.Sc. Part-I Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows:

Paper - I	Physical Geography
Paper - II	Human Geography.
Paper - III	Practical Geography

B.A. /B.Sc. Part-II

The B.A./B.Sc. Part-II Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows:

Paper-I	Economic and Resources Geography
Paper-II	Regional Geography of India
Paper-III	Practical Geography

B.A. /B.Sc. Part III

The B.A. /B.Sc. Part III Examination in Geography will be 150 marks. There will be two theory papers and one Practical each of 50 marks as follows

Paper – I	Remote Sensing and GIS
Paper - II	Geography of Chhattisgarh
Paper - III	Practical Geography

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

B.A. /B.Sc. Part I

PAPER - I
PHYSICAL GEOGRAPHY
Max. Marks: 50
(Paper Code-0117)

Unit I The Nature and Scope of Physical Geography. Origin of the Earth, Geological Time Scale, Earth's Interior, Continental Drift Theory (Wegner), Plate Tectonics, Isostasy.

Unit II Earth movements: Earthquakes and Volcanoes. Rocks, Weathering, Erosion, and Normal cycle of erosion, Evaluation of landscapes- Fluvial, Arid, Glacial, Karts and Coastal landscape.

Unit III Elements of Weather and Climate, Composition and Structure of the Atmosphere. World patterns of Atmospheric Temperature, Pressure, and Wind.

Unit IV Atmospheric Moisture, and Disturbances, Climatic Classification (Koppen and Thornthwait) types, characteristics and World patterns.

Unit V Surface relief of Pacific Ocean, Atlantic Ocean, and Indian Ocean. Distribution of Temperature and Salinity of oceans and seas, Currents and Tides, Ocean Deposits and Coral Reefs, and Oceanic Resources.

Books Recommended:

1. Barry, R. G. and Chorley, R. J. (1998): Atmosphere, Weather and Climate. Routledge, London.
2. Bryant, H. Richard (2001): Physical Geography Made Simple, Rupa and Company. New Delhi
3. Bunnett, R.B. (2003): Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Private Ltd.
4. Garrison, T. (1998): Oceanography, Wordsworth Company., Belmont.
5. Lake, P. (1979): Physical Geography (English and Hindi editions), Cambridge University Press, Cambridge.
6. Lal, D.S. 1993 : Climatology, 3rd edition, Chaitanya Pub. House, New Delhi
7. Leong Goh Cheng (2003): Certificate Physical and Human Geography, Oxford University Press, New Delhi.
8. Monkhouse, F.J. (1979): Physical Geography. Methuen, London
9. Singh, S. (2003): Physical Geography. (English and Hindi editions.). Prayag Pustak Bhawan, Allahabad;
10. Trewartha, G.T., Robinson, A.H., Hammond, E.H., and Horn, A.T. (1976/1990): Fundamentals of Physical Geography, 3rd edition. MacGraw-Hill, New York.
11. Singh, M.B. (2001): *Bhoutik Bhugol*, Tara Book Agency, Varanasi
12. Strahler, A.N. and Stahler, A.M. (1992): Modern Physical Geography. John Wiley and Sons, New York.

27.05.19
(Dr. S. K. Das)

27.5.19

27/05/19

27.05.19
DR. R. Chandra

B.A. /B.Sc. Part I

PAPER - II
HUMAN GEOGRAPHY
Max. Marks: 50
(Paper Code-0118)

Unit I Definition and Scope of Human Geography. Man - environment relationship; Determinism, Possibilism, and Probabilism; Human Development Index (HDI).

Unit II Classification of Human Races – their Characteristics and Distribution; Human adaptation to environment: Eskimos, Bushman, Pigmy, Gond, Masai, and Naga.

Unit III Growth, Density and Distribution of World Population and factors influencing Spatial distribution; Over , Under, and Optimum Population; Migration of Population. .

Unit IV Settlements – Urban Settlements: Urbanization, Evolution and Classification, Trends of Urbanization.

Rural settlements: Characteristics, Types and Regional Pattern, Rural Houses in India - Types, Classification and Regional Pattern.

Unit V Issues – Global Warming, Climate Change, Deforestation, Desertification, Air, Water and Soil Pollution.

Books Recommended:

1. Chisholm, M. (1985): Human Geography, 2nd edition, Penguin Books, London.
2. De Blij, H.J.(1996): Human Geography: Culture, Society and Space,. 2nd edition. John Wiley and Sons, New York,
3. Fellman, J. D., Arthur, G., Judith, G., Hopkins, J. and Dan, S. (2007): Human Geography: Landscapes of Human Activities. McGraw-Hill, New York. 10th edition.
4. Haggett, P. (2004): Geography: A Modern Synthesis. 8th edition, Harper and Row, New York.
5. Huggett, R. J. (1998): Fundamentals of Biogeography, Routledge, London.
6. Hussain, M. (1994): Human Geography, Rawat Publications, Jaipur.
7. Johnston, R. J., Gregory, D., Pratt, G. and Watts, M. (2009): The Dictionary of Human Geography. 5th edition, Basil Blackwell Publishers, Oxford.
8. Kaushik, S.D. and Sharma, A.K. (1996): Principles of Human Geography (in Hindi), Rastogi Publication, Meerut.
9. Norton, W. (2008): Human Geography, Oxford University Press, New York. 5th ed.
10. Saxena, H. M. (2000): Environmental Management. Rawat Publications., Jaipur and New Delhi.
11. Singh, K. N. and Singh, J. (2001): *Manav Bhugol*. Gyanodaya Prakashan, Gorakhpur. 2nd edition.
12. Singh, L.R. (2005): Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad
13. Smith, D. M.(1977): Human Geography- A Welfare Approach, Edward Arnold (Publishers) Ltd.,London
14. Stoddard, R.H., Wishart, D.J. and Blouet, B.W. (1986): Human Geography. Prentice-Hall, Englewood Cliffs, New Jersey.

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B.A. /B.Sc. Part I

PAPER - III

PRACTICAL GEOGRAPHY

Max. Marks: 50

SECTION A

CARTOGRAPHY AND STASTISTICAL METHODS (M.M. 25)

Unit I Scale: Statement Scale , Representative Fraction (R.F.), Linear scale – Simple, Diagonal, Comparative, and Time Scales.

Unit II Contour: Methods of showing relief; Hachures, Contours; Representation of different landforms by contours.

Unit III Graph and Diagram: Line graph, Bar Diagram (Simple and Compound), Circle Diagram, Pie Diagram

Unit IV Statistical Technique: Mean, Median and Mode

SECTION B

SURVEYING - (M.M. 15)

Unit V Chain and Tape Survey. Triangulation method, Open Traverse and Closed Traverse

PRACTICAL RECORD AND VIVA VOCE (M.M. 10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

27.05.19 (Dr. S. K. Das)

27.5.19

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27.05.19 DR. R. Chandra

बी.ए./बी.एस.सी. – प्रथम वर्ष
प्रश्न पत्र–प्रथम
भौतिक भूगोल

अधिकतम अंक : 50

(कोड क्रमांक 0117)

इकाई –1. भौतिक भूगोल की प्रकृति एवं विषय क्षेत्र, पृथ्वी की उत्पत्ति, भूगर्भिक समय मापनी, पृथ्वी की आंतरिक संरचना, वेगनर का महाद्वीपीय प्रवाह सिद्धांत, पट्ट विवर्तन, भूसंतुलन ।

इकाई –2. पृथ्वी की हलचल–भूकंप, ज्वालामुखी, चट्टान अपक्षय, अपरदन, सामान्य अपरदन चक्र, वायु, हिम बहता जल, भूमिगत जल और सागरीय जल से निर्मित भूदृश्य ।

इकाई –3. मौसम और जलवायु के तत्व, वायुमंडल की संरचना एवं संघटन, वायुमंडलीय ताप, दाब तथा हवाएं ।

इकाई –4. वायुमंडलीय आर्द्रता विक्षोम, जलवायु वर्गीकरण कोपेन और थार्नथ्वेट के आधार पर वैश्विक जलवायु की विशेषताएँ और विश्व प्रतिरूप ।

इकाई –5. महासागरीय उच्चावच्च प्रशांत महासागर, आंध्रमहासागर एवं हिन्द महासागर । सामुद्रिक तापमान लवणता जलधाराएँ एवं, ज्वारभाटा, सामुद्रिक निक्षेप एवं प्रवाल भित्ती, सामुद्रिक संसाधन ।

Books Recommended:

1. Barry, R. G. and Chorley, R. J. (1998): Atmosphere, Weather and Climate. Routledge, London.
2. Bryant, H. Richard (2001): Physical Geography Made Simple, Rupa and Company. New Delhi
3. Bunnett, R.B. (2003): Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Private Ltd.
4. Garrison, T. (1998): Oceanography, Wordsworth Company., Belmont.
5. Lake, P. (1979): Physical Geography (English and Hindi editions), Cambridge University Press, Cambridge.
6. Lal, D.S. 1993: Climatology, 3rd edition, Chaitanya Pub. House, New Delhi
7. Leong Goh Cheng (2003): Certificate Physical and Human Geography, Oxford University Press, New Delhi.
8. Monkhouse, F.J. (1979): Physical Geography. Methuen, London
9. Singh, S. (2003): Physical Geography. (English and Hindi editions.). Prayag Pustak Bhawan, Allahabad;
10. Trewartha, G.T., Robinson, A.H., Hammond, E.H., and Horn, A.T. (1976/1990): Fundamentals of Physical Geography, 3rd edition. MacGraw-Hill, New York.
11. Singh, M.B. (2001): *Bhoutik Bhugol*, Tara Book Agency, Varanasi
12. Strahler, A.N. and Stahler, A.M. (1992): Modern Physical Geography. John Wiley and Sons, New York.

27.5.19 (Dr. S. K. Das)

27.5.19

27/05/19

27.05.19 DR. R. Sharma

बी.ए./बी.एस.सी. – प्रथम वर्ष
प्रश्न पत्र–द्वितीय
मानव भूगोल

अधिकतम अंक : 50

(कोड क्रमांक 0118)

इकाई –1. मानव भूगोल की परिभाषा एवं विषय क्षेत्र मानव वातावरण संबंध, निश्चयवाद, संम्भववाद प्रसम्भववाद, मानव विकास सूचकांक ।

इकाई –2. मानव प्रजाति उद्‌भव प्रकार विशेषताएँ एवं वितरण, मानव द्वारा वातावरण से अनुकुलन एस्किमो, बुशमेन, पिग्मी, गोंड, मसाई, और नागा ।

इकाई –3. वैश्विक जनसंख्या– वृद्धि, घनत्व, जनसंख्या के वितरण को प्रभावित करने वाले स्थानिक कारक, जनाधिक्य, न्यूनतम जनसंख्या और अनूकूलतम आदर्श जनसंख्या, जनसंख्या एवं प्रवास।

इकाई –4. अधिवास– नगरीय अधिवासः नगरीयकरण उद्‌भव, प्रकार एवं नगरीकरण के प्रतिरूप । ग्रामीण अधिवास : विशेषताएँ , प्रकार और क्षेत्रीय प्रतिरूप, भारत में ग्रामीण अधिवास, प्रकार, वर्गीकरण और क्षेत्रीय प्रतिरूप ।

इकाई –5. उभरते पर्यावरणीय मुद्‌दे– ग्लोबल वार्मिंग, जलवायु परिवर्तन निर्वनिकरण, मरूस्थलीकरण प्रदूषण – जल, वायु और मृदा प्रदूषण ।

Books Recommended:

1. Chisholm, M. (1985): Human Geography, 2nd edition, Penguin Books, London.
2. De Blij, H.J.(1996): Human Geography: Culture, Society and Space,. 2nd edition. John Wiley and Sons, New York,
3. Fellman, J. D., Arthur, G., Judith, G., Hopkins, J. and Dan, S. (2007): Human Geography: Landscapes of Human Activities. McGraw-Hill, New York. 10th edition.
4. Haggett, P. (2004): Geography: A Modern Synthesis. 8th edition, Harper and Row, New York.
5. Huggett, R. J. (1998): Fundamentals of Biogeography, Routledge, London.
6. Hussain, M. (1994): Human Geography, Rawat Publications, Jaipur.
7. Johnston, R. J., Gregory, D., Pratt, G. and Watts, M. (2009): The Dictionary of Human Geography. 5th edition, Basil Blackwell Publishers, Oxford.
8. Kaushik, S.D. and Sharma, A.K. (1996): Principles of Human Geography (in Hindi), Rastogi Publication, Meerut.
9. Norton, W. (2008): Human Geography, Oxford University Press, New York. 5th ed.
10. Saxena, H. M. (2000): Environmental Management. Rawat Publications., Jaipur and New Delhi.
11. Singh, K. N. and Singh, J. (2001): *Manav Bhugol*. Gyanodaya Prakashan, Gorakhpur. 2nd edition.
12. Singh, L.R. (2005): Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad
13. Smith, D. M.(1977): Human Geography- A Welfare Approach, Edward Arnold (Publishers) Ltd.,London
14. Stoddard, R.H., Wishart, D.J. and Blouet, B.W. (1986): Human Geography. Prentice-Hall, Englewood Cliffs, New Jersey.

27.5.19 (Dr. S. K. Das)

27.5.19

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27.05.19 DR. R. Sharma

बी.ए./बी.एस.सी.–प्रथम वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

भाग– अ मानचित्र तकनीक एवं सांख्यिकी विधियां (25)

इकाई –1 मपनी– कथनात्मक मापन, प्रतिनिधि भिन्न सामान्य रैखिक मापनी विकर्ण तुलनात्मक एवं समय मापनी.

इकाई –2 उच्चावच प्रदर्शन की विधियां – हैश्यूर समोच्च रेखा, तथा विविध स्थलाकृतियों की प्रदर्शन.

इकाई –3 रैखिक आरेख, दंड आरेख, (सामान्य एवं मिश्रित) चक्र आरेख – समानुपातिक वृत्त आरेख विभाजित वृतारेख

इकाई –4 सांख्यिकी विधियां : औसत, माध्यिका , बहुलक

भाग– ब सर्वेक्षण (15)

इकाई –5 चैन और फीता सर्वेक्षण–त्रिभुजीकरण, खुला एवं बंद मार्ग मापन,

प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा (10)

Books Recommended:

1. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
2. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
3. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
4. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai
5. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London, First Publication.
6. Raisz, E. (1962): General Cartography. John Wiley and Sons, New York. 5th edition.
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.
8. Sharma, J. P. (2001): *Prayogik Bhugol.*, Rastogi Publication, Meerut 3rd. edition.
9. Singh, R.L. and Singh, Rana P.B. (1993): Elements of Practical Geography. (Hindi and English editions). Kalyani Publishers, New Delhi,.
10. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
11. Venkatramaiah, C. (1997): A Text Book of Surveying, Universities Press, Hyderabad.

27.5.19 (Dr. S. K. Das)

27.5.19

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27.05.19 DR. R. Sharma

Revised syllabus

SOCIOLOGY 2019 - 2020

B.A. PART-I

Paper – I

INTRODUCTION TO SOCIOLOGY (Paper Code - 0115)

UNIT-I **Sociology** : Meaning, Nature, scope, Subject matter and significance.
Basic concepts : Society, Community, institution, Association, group, Status and role.

UNIT-II **Social Institutions:** Marriage, Family and kinship.
Culture and society: Culture, socialization, The individual and society, social control, norms and values.

UNIT-III **Social Stratification:** Meaning, forms and theories.
Social Mobility: Meaning, forms and theories.

UNIT-IV **Social change**: Meaning and patterns, types, factors, evolution and progress.

UNIT-V **Social System and process:** Social System- meaning, characteristics and elements.
Social process- Meaning, elements, characteristics and types.

ESSENTIAL READINGS :-

1 Bottomore T.B., Sociology- A guide to Problems and Literature, Bombay. George Allen and unwin(India) 1972.
2 Inkeles, Alex, What is Sociology ? New Delhi, Prentice Hall of India 1987.
3 Jayram, N., Introductory Sociology, Madras Maomillan India 1988.
4 Johnson Harry, M., Sociology of systematic Introduction New Delhi Allied Publishers 1995.

Shobhash 10/6/2019 Asank 10.06.2019 10-6-19

Revised syllabus

SOCIOLOGY -2019-2020

B.A. PART-I

Paper –II

CONTEMPORARY INDIAN SOCIETY (Paper Code-0116)

UNIT-I **Classical View about Indian Society:** Verna, Asharam, Karma, Dharma and Purusharth.

UNIT-II **The Structure and composition of Indian society.**
Structure ; Village ,Towns, Cities and Rural – Urban Linkage,
Compositions: Tribes, Dalits, Women and Minorities.

UNIT-III **Basic Institutions of Indian Society:**
Caste system, Joint Family, Marriage and Changing dimensions.

UNIT-IV **Familial Problems:**
Dowry, Domestic violence, Divorce, Intra-intergenerational conflict, problem of elderly.

UNIT-V **Social Problems:**
Surrogate Motherhood, Live in Relationship, Regionalism, Communalism, Corruption, Youth unrest.

ESSENTIAL READINGS :-

1 Dube, S. C. 1995. Society in India, New Delhi: National Book Trust.
2 Mandelbaum, D.G. 1970. Society in India, Bombay: Poular Prakashan.
3 Shriniwas, M.N. 1973. Social Change in Modern India, California: University of California Press.
4 Shriniwas, M.N. 1990. Social Change Structure, New Delhi: Hindustan Publishing Corporation.
5 Uberoi Patricia, 1993. Family and Marriage In India, New Delhi: Oxford University Press.

Shobhasth 10/6/2019

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बी. ए.. भाग एक B.A. Part I

राजनीति विज्ञान Political Science

प्रथम प्रश्न पत्र : राजनीतिक सिद्धान्त Paper I : Political Theory

इकाई 1 : राजनीति विज्ञान का अर्थ, परिभाषा (आधुनिक अवधारणा सहित) । राजनीति एक विशिष्ट मानवीय व्यवहार के रुप में । शक्ति, सत्ता, प्रभाव : अर्थ, विशेषताएं, प्रकार । राजनीति विज्ञान की अध्ययन पध्दतियां : परम्परागत एवं व्यवहारवाद एवं उत्तर व्यवहारवाद ।

Unit I : Meaning and Definition of Political Science (with modern concept). Politics as a specific human behaviour. Power, Authority and Influence : meaning, features and kinds. Method of Study to Political Science : Traditional , Behaviouralism and Post Behaviouralism.

इकाई 2 : राज्य एवं उसके आवश्यक तत्व । राज्योत्पत्ति के विभिन्न सिद्धान्त, मार्क्सवादी सिद्धान्त । सावयविक सिद्धान्त ।

Unit 2 : State and its essential elements. Various theories of the origin of the State, Marxist theory . Organismic Theory.

इकाई 3 : सम्प्रभुता एवं उसकी बहुलवादी आलोचना । अधिकारः अर्थ, प्रकार , सिद्धान्त । कर्तव्य । स्वतन्त्रता : अर्थ , प्रकार, संरक्षण । समानता : अर्थ , प्रकार एवं स्वतन्त्रता से सम्बंध । प्रजातन्त्र : परिभाषा, व्यापक अर्थ, चुनौतियां, सफलता के लिए आवश्यक शर्तें , गुण–दोष । प्रत्यक्ष प्रजातन्त्र ।

Unit 3: Sovereignty and its pluralistic criticism. Rights : meaning, kinds and theories. Duties. Liberty : meaning, kinds , safeguards. Equality : meaning, kinds and relations with Liberty. Democracy : meaning, comprehensive meaning, challanges, conditions for its success, merits and demerits. Direct Democracy.

इकाई 4 : शासन के प्रकार : एकात्मक व संघात्मक , संसदीय व अध्यक्षात्मक, निरंकुशतन्त्र । शासन के अंग : कार्यपालिका, व्यवस्थापिका, न्यायपालिका । शक्ति पृथक्करण का सिद्धान्त व नियंत्रण –संतुलन का सिद्धान्त । संविधान : अर्थ , प्रकार । प्रतिनिधित्व के सिद्धान्त एवं निर्वाचन प्रणालियां ।

Unit 4 : Kinds of Government : Unitary and Federal, Parliamentary and Presidential. Dictatorship. Organs of Government : Executive, Legislature and Judiciary. Theory of Separation of Powers and Checks and Balances. Constitution : meaning and kinds. Theories of representation and Electoral Process.

इकाई 5 : लोककल्याणकारी राज्य। दल पद्धति : अर्थ , प्रकार, पद्धति । दबाव समूह : अर्थ, प्रकार, तकनीक । सामाजिक परिवर्तन : अर्थ, विशेषताएं , सिद्धान्त । नारीवाद, राष्ट्रवाद ।

Unit 5 : Public Welfare State. Party System : meaning , kinds , process. Pressure Groups : meaning, kinds and technique. Social Change : meaning, characteristics, theories. Feminis. Nationalism.

27/6/19 27/6/19

बी.ए. प्रथम

प्रथम प्रश्न पत्र

राजनीतिक सिद्धान्त

1. ओ.पी. गाबा, समकालीन राजनीतिक सिद्धांत, मयूर पेपर बैक्स नोएडा।
2. ओ.पी. गाबा, राजनीति सिद्धांत की रूपरेखा, मयूर पेपर बैक्स नोएडा।
3. जे.सी. जौहरी व सीमा जौहरी, आधुनिक राजनीति विज्ञान के सिद्धांत, स्टर्लिंग पब्लिकेशन।
4. पंत गुप्ता जैन, राजनीति शास्त्र के आधार, सेन्ट्रल पब्लिकेशिंग हाऊस इलाहाबाद।
5. प्रो. आनंद प्रकाश अवस्थी , भारतीय शासन एवं राजनीति, लक्ष्मीनारायण अग्रवाल, आगरा।
6 Andrew Haywood Political Theory , An Introduction.
7 O.P. Gaba An Introduction to Political Theory, Macmillan India Ltd.

27/6/19

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बी. ए. भाग एक B. A. Part I

राजनीति विज्ञान Political Science

द्वितीय प्रश्न पत्र : भारतीय शासन एवं राजनीति Paper II : Indian Government and Politics

इकाई 1 : भारतीय राष्ट्रीय आन्दोलन : 1858 का प्रथम स्वतन्त्रता संग्राम, असहयोग आन्दोलन, सविनय अवज्ञा आन्दोलन, भारत छोड़ो आन्दोलन । भारत का संविधानिक विकास : 1858, 1909,1919 और 1935 का भारत शासन अधिनियम ।

Unit 1 : Indian National Movement : First Independence Movement 1858, Non cooperation Movement, Civil Disobedience Movement and Quit India Movement.Constitutional Development of India : Govt. of India Act of 1858,1909, 1919 and 1935.

इकाई 2 : भारतीय संविधान : विशेषताएं , प्रस्तावना, स्त्रोत, । संघीय व्यवस्था , मौलिक अधिकार, मूल कर्तव्य,नीति निर्देशक तत्व । संविधान संशोधन प्रक्रिया ।

Unit 2 : Constitution of India : Characteristics, Preamble, Sources. Federal System. Fundamental Rights and Duties, Directive Principles of State Policy. Constitution Amendment Process.

इकाई 3 : संघीय कार्यपालिका : राष्ट्रपति, उपराष्ट्रपति, मन्त्रिपरिषद् और प्रधानमन्त्री । संघीय व्यवस्थापिका :संसद : लोकसभा और राज्यसभा । संसदीय प्रक्रिया ।

Unit 3 : Union Executive : President , Vice President, Council of MInisters and Prime MInister. Union Legislature : Parliament: Lok Sabha and Rajya Sabha. Parliamentary Procedure.

इकाई 4 : संघीय न्यायपालिका : सर्वोच्च न्यायालय : गठन, क्षेत्राधिकार, न्यायिक पुनरावलोकन, न्यायिक सक्रियतावाद । राज्य कार्यपालिका : राज्यपाल , मन्त्रिपरिषद् और मुख्यमन्त्री ।

Unit 4 : Union Judiciary : Supreme Court : Organisation, Jurisdiction, Judicial Review,Judicial Activism. State Executive : Governor, Council of Ministers and Chief Minister.

इकाई 5 : राज्य व्यवस्थापिका : विधानसंभा एवं विधानपरिषद् । निर्वाचन आयोग व चुनाव सुधार । राष्ट्रीय व क्षेत्रीय दल । भारतीय राजनीति के प्रमुख मुद्दे : जाति, धर्म, भाषा और क्षेत्र । पंचायती राज व्यवस्था।

Unit 5 : State Legislature : Legislative Assembly and Legislative Council. Election Commission and Election Reforms. National and Regional Parties. Major issues of Indian Politics : Caste, Religion, Language and Region. Panchayati Raj System.

संदर्भ पुस्तक (Reference Books)

8. डॉ. सुभाष कश्यप, भारत का संवैधानिक विकास और संविधान, हिन्दी माध्यम कार्यान्वय निदेशालय दिल्ली विश्वविद्यालय।
डॉ. सुभाष कश्यप, हमारी संसद, भारत की संसद एक परिचय, राष्ट्रीय पुस्तक न्यास।
10. डॉ. रूपा मंगलानी, भारतीय शासन एवं राजनीति, राजस्थान हिन्दी ग्रंथ अकादमी जयपुर।
11- M.V. Pylee , Constitutional History of India , S.Chand.
12- D.D. Basu Indian Constitution

27/6/19 27/6/19

B.A. – Ist Year

MUSIC

Session- 2019-20

Note :- 1. B. A.(General) three year degree course with the relative weight of practical and theory being in the proportion 50 and 50 respectively (Model curriculum, page No.21A) courses. Hence the Central Board of Studies devide the ratio as :-

Ist paper	40 marks (written or Theory) Revised as 50
2nd paper	40 marks (written or Theory) Revised as 50

Practical of 10 marks from which 10 marks are for the internal sessional work.
B.A. General (as one of the optional objccts).
Hindustain Music (Vocal +Instrumental..)

THEORY
PAPER - I
THEORY OF INDIAN MUSIC- VOCAL \INSTRUMENTAL M.M. : 50
(Paper Code-0131)

1. **Definition and Illustrations :-** Naad, Shruti, Swara, Saptak, Purvang, Uttarang, Vadi, Samvadi, Vivadi, Anuvadi, Alankar, That, Mind, Soota, Bol Alap, Tan, Tihai, pakad.

2. **General knowledge of the Musical Styles:-**
Dhrupad, Dhamar, khyal, Thumari, Tarana, Tappa, Hori, Chaturang, Geet, Bhajan, Ghazal,

3. General Knowledge of the biographies and the contributions of the following Musicians Ameer khusro, Swami Haridas, Tansen, Nayak Baiju, Nayak Gopal, Tyagraja.

4. Merits and Demerits of Musicians according to the Shastras.

5. **Study of the Theoritical details of prescribed Ragas for Practical Course as follows :-** Yaman, Bhupali, Allhaiya Bilawal, Bhairav, Kafi, Khamaj, Brindavani - sarang, Durga (Bilawal That).

14/06/19 14/06/19 14/06/19

THEORY

PAPER – II

THEORY OF INDIAN MUSIC- VOCAL /INSTRUMENTAL **M.M. : 50**

(Paper Code-0132)

SESSION – 2019-20

1. Hindustani Music and Karnatak Music, short history, similarities and Differences.

2. Study of Notation Systems - Bhatkhande and Paluskar Notation system.

3. Time Theory of the Ragas, Purva Raga, Uttar Raga, Sandhi Prakash Raga, Parmel Praveshak Ragas.

4. Formation of Ragas, Sampurna, Shadav, Audawa, Jati. That or Mel Theory.

5 Definition of Tala, Matra, Avartan, Bol, Vibhag, Khali, Bhari, Vilambit, Madhya and Drutlaya. Writing of the Talas in Notation with Dugan

PRACTICAL

M.M. : 50

1. Alankar (Palta)

2. Study of the following Ragas :- Yaman, Bhupali, Allahaiya Bilawal, Bhairav, Kafi, Khamaj, Brindavani Sarang, Durga (Bilawal That)

3. Two Vilambit Khyalas or Masitkhani Gat in any two of the above mentioned Ragas.

4. Madhya Laya Khyalas or Razakhani Gat with Alap, Tan, Tora Jhala, in any five of the above Ragas.

5. Lakshan Geet, Saragam Geet in all the above Ragas.

6. Ability to demonstrate (orally by giving Tali and Khali of on hand) Talas Prescribed in course as follows :- Dadra, Kaharva, Teen Tal, Ektal, Chautal, Jhaptal.
7. One Dhrupad or Dhamar / one Gat other than teen Tal (Composition only)

8. One Bhajan, Ghazal, Geet, Patrioteec song and prayer.

14/06/19

INTERNAL SCSSIONAL WORK -

1. Ten Descriptions of Music Programmes (Radio and T. V. personally attended)

RECOMMENDED BOOK -

1. Kramik Pustak Malika (Part I to Part IV) By pt. V.N. Bhatkhande.
2. Sangitanjali Part I to VI By Pt. Onkar Nath Thakur.
3. Sangeet Visharad (Hathras) By Vasant
4. Sangeet Bodh, By Dr. Sharad Chandra Paranjape
5. Dhawani aur Sangeet, by Prof. L. K. Sing
6. Tan Malika, by Raja Bhaiya Puchhwale
7. Hamare Sangeet Ratna, by Lakshmi Narayan Garg.
8. Rag Parichaya Part I to IV By Harish Chandra Shrivastava
9. All Journals and Magazenes of Music
10. Sitar Malika, (Hathras)
11. Tabla Vigyan, by Dr. Lalmani Misra
12. Swar aur Ragon ke Vikas me Vadyon ka Yogdan, By Prof. Indrani Chakrawarty.
13. Sangeet Manjusha By Prof. Indrani Chakrawarty.
14. Music - its methods and technique and teaching in Higher Education. By Prof. Indrani Chakrawarty.
15. Sangeetanjali Part I to V By Pt. Ramashraya Jha.

10/06/10

M A N A G E M E N T
Paper - I
PRINCIPLE OF MANAGEMENT
(Paper Code-0135)

Time : 3 HoursMax. **Marks : 75**

UNIT-I Evolution of Modern Industrial Organisation and Management Thought.

Industrial Revolation - Impact on society

Contribution - Frederic Winslow Taylor Eiton Moyo

- Douglas Mc. Gregor

The nature and scope of Management process definition of Management and Management process important characteristics of the process. The eight prepositions for effective organisation Philosophy, Urwick's Ten Principles, Different Schools of Thought.

UNIT-II Coordination - Definition and Meaning, Need and importance principles and Techni-ques.

Planning - Definition, Nature and purpose nature and process of forecasting.

Basic objective & - Objectives long and short range criteria of sound objectives.

Types of Plan

- Types of Plans Decision making Meaning and basis for selecting alternatives.
- Strategies : Policies and Procedure.
- Qualities of Planning Process.

ORGANISATION

UNIT-III Nature, Importance, Components of Organisation,

Departmentation - Methods.

Span of Control - Wide and Narrow Spans.

Authority - Line and Staff, Decentralization, delegation, types of staff authority, factors determining the degree of decentralization.

Staffing : Nature and Importance.

Factors determining the selection of Managerial personnel.

Management Appraisals.

Development and Training of Managers.

UNIT-IV Deirection : Nature and importance of Communication.

Methods of building a communication net work.

Personal communication and use of orders.

Changing patterns of supervisory responsibility.

Factors of effective supervision

Selection and training of supervisors.

T.W.I. Programmes.
Nature and Importance of discipline.
Causes of Indiscipline.
Means of effective discipline.

UNIT-V Basic steps in control process.
Importance of Control.
Requirements for an effective control.
Purpose of Budgeting.
Types of budgets.
Elements of costs and types of costing.
Role of cost accounting.

BOOKS RECOMMENDED:

1. Koontz, Harold : Principles of Management
2. Chatterjee, S. S. : An Introduction to Management
3. Kast, Fremont E. : Organisation Management
4. Asthena G. P. : The Ground Work of Management.
5. डॉ गुप्ता : व्यवसाय प्रशासन एवं प्रबंध
6. डॉ. आर. सी. सक्सेना : व्यवसाय प्रशासन एवं प्रबंध
7. Dr. K. N. Dinesh : Structure of Medium Scale Industries.

Paper-II
COMMERCIAL ACCOUNTANCY
(Paper Code-0136)

Max. Marks : 75

UNIT-1 Definition and objects of book-keeping, principle of Double Entry, its object sand advatages.

Journal Simple journal enatries,compound journal entries rules for recording journ.

UNIT-2 Ledger &ledger account, positing of journal entries, types of ledger accounts Balancing of ledger accounts Cash book:Cash book with cash and discount columns three column or cash book, petty cash book.

UNIT-3 Bank reconciliation statement.

Bill Transaction.

Endorsement of Bill

Dishonourment of Bill

Accomodation Bill

UNIT-4 1. TrialBalance.

2. Rectification oferrors

3. Capital

andrevenueexpenditure. **UNIT-5 Final Accounts:**

1. Manufacturing accountstrading
2. Profit and lossaccount
3. Balance Sheet.

BOOKS RECOMMENDED:

1.	M.M.Shah	:	Double entry Bookkeeping
2.	R.R.Gupta	:	Book keeping &Accounts.
3.	T.S.Grewal	:	Introduction toaccountancy.
4.	Juneja, Chawla &Saksena:		ElementaryBook-keeping.
5.	Karim&Khanuja	:	FinancialAccounting

B.A./B.Sc. – First Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - First

Name of the Paper :- FOUNDATION OF ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Anthropology. History of Anthropology. Branches of Anthropology -

(a) Socio-cultural Anthropology
(b) Physical Biological Anthropology
(c) Archaeological Anthropology
(d) Linguistic Anthropology

UNIT – II Relationship of Anthropology with other disciplines: Life Sciences, Medical Sciences, Social Sciences: History, Economics, Sociology, Psychology, Political Science

UNIT – III Foundation in Biological Anthropology

(a) Human Evolution with respect to Hominid fossils
(b) Human Variation: Types and causes
(c) Human Genetics: Concept, scope and branches
(d) Human growth and development: Definition, scope, methods and factors effecting human growth and development

UNIT – IV Fundamentals in Social-Cultural Anthropology.

(a) Culture, Society, Community, Group, Institution
(b) Human Institution:-
Family: Definiton, types and function of family
Marriage: Definition, forms of marriage and its functions
Kinship: Definition, types and functions
Religion: Theories on the origin of religion
(c) Basic techniques of data collection :
Observation , Schedule, Questionnaire, Geneology

UNIT – V Fundamentals in Archaeological Anthropology.

(a) Tool typology & Technology: Paleolithic, Mesolithic & Neolithic
(b) Cultural evolution: Broad outlines of cultures (Stone age to metal age)
(c) Dating techniques in archaeology

20/06/19

B.A. /B.Sc. – First Year

Session: 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	Second
Name of the Paper	:-	PHYSICAL/ BIOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I	Meaning, scope, History of Physical Anthropology & its applied aspects Theories of organic evolution: Lamarckism, Neo-lamarckism, Darwinism, Neo-darwinism & Synthetic theory of evolution
UNIT – II	Position of Man in animal kingdom, Classification of living primates, Comparative anatomy of Man and Apes (with special reference to skull, pelvis, dentition and long bones)
UNIT – III	Fossil evidence of human evolution: Ramapithecus, Australopithecus, Pithecanthropus, Sinanthropus, Neanderthal, Cromagnon, Grimaldi man, Chancelade man.
UNIT – IV	Concept of Race: Race formation and Criteria of racial classification, UNESCO Statement, Racial element in India, Major races of the world.
UNIT – V	Human Genetics: **a.** Structure of Chromosome, DNA & RNA **b.** Mendelian principle. **c.** Types of Inheritance in Human

20/06/19

B.A./B.Sc. – First Year

Session : 2018-19

Name of the Subject	:-	Anthropology
Paper	: -	Practical
Name of the Paper	:-	OSTEOLOGY AND CRANIOMETRY

Total Marks : 50 Pass Marks : 17

I. Identification of bones of human Skeleton. Sketching and labeling of various normas of skull, Overview of Pectoral & Pelvic girdles, Femur & Humerus bone

II. Craniometry :-
1. Maximum Cranial length.
2. Maximum Cranial Breadth.
3. Maximum frontal Breadth.
4. Bizygomatic Breadth.
5. Nasal Height.
6. Nasal Breadth
7. Minimum frontal breadth
8. Bimaxillary Breadth.
9. Maximum Biorbital Breadth
10. Length of magnum foramen.

III. Craniometric indices :
1. Cranial Index
2. Nasal Index

20/06/19

MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.A. Part-I
MATHEMATICS
PAPER - I
ALGEBRA AND TRIGONOMETRY

UNIT-I Elementary operations on matrices, Inverse of a matrix. Linear independence of row and column matrices, Row rank, column rank and rank of a matrix. Equivalence of column and row ranks. Eigenvalues, eigenvectors and the characteristic equations of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix.

UNIT-II Application of matrices to a system of linear (both homogeneous and nonhomogeneous) equations. Theorems on consistency of a system of linear equations. Relation between the roots and coefficients of general polynomial equations in one variable. Transformation of equations. Descarte's rule of signs. Solutions of cubic equations (Cardons method), Biquadratic equation.

UNIT-III Mappings, Equivalence relations and partitions. Congruence modulo n. Definition of a group with examples and simple properties. Subgroups, generation of groups, cyclic groups, coset decomposition, Lagrange's theorem and its consequences. Fermat's and Euler's theorems. Normal subgroups. Quotient group, Permutation groups. Even and odd permutations. The alternating groups An. Cayley's theorem.

UNIT-IV Homomorphism and Isomorphism of groups. The fundamental theorems of homomorphism. Introduction, properties and examples of rings, Subrings, Integral domain and fields Characteristic of a ring and Field.

TRIGONOMETRY :

UNIT-V De-Moivre's theorem and its applications. Direct and inverse circular and hyperbolic functions. Logarithm of a complex quantity. Expansion of trigonometrical functions. Gregory's series. Summation of series.

TEXT BOOK :

1. I.N. Herstein, Topies in Algebra, Wiley Eastern Ltd., New Delhi, 1975
2. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd.New Delhi, 2000.
3. Chandrika Prasad, Text-Book on Algebra and Theory of equations, Pothishala Private Ltd., Allahabad.
4. S.L. Loney, Plane Trigonometry Part II, Macmillan and Company, London.

REFERENCES :

1. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, First Course in linear Algebra, Wiley Eastern, New Delhi, 1983.
2. P.B. Bhattacharya, S.K.Jain and S.R. Nagpaul, Basic Abstract Algebra (2 edition), Cambridge University Press, Indian Edition, 1997.
3. S.K. Jain, A. Gunawardena and P.B. Bhattacharya, Basic linear Algebra with MATLAB, Key College Publishing (Springer-Verlag), 2001.
4. H.S. Hall and S.R. Knight, Higher Algebra, H.M. Publications, 1994.
5. R.S. Verma and K.S. Shukla, Text Book on Trigonometry, Pothishala Pvt. Ltd., Allahabad.

B.A. Part-I
MATHEMATICS
PAPER - II
CALCULUS

DIFFERENTIAL CALCULUS:

UNIT-I $\varepsilon - \delta$ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuties. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

UNIT-II Asymptotes. Curvature. Tests for concavity and convexity. Points of inflexion. Multiple points. Tracing of curves in cartesian and polar coordinates.

INTEGRAL CALCULUS:

UNIT-III Integration of transcendental functions. Reduction formulae. Definite integrals. Quadrature. Rectification. Volumes and surfaces of solids of revolution.

ORDINARY DIFFERENTIAL EQUATIONS:

UNIT-IV Degree and order of a differential equation. Equations reducible to the linear form. Exact differential equations. First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations.

UNIT-V Linear differential equations of second order. Transformation of the equation by changing the dependent variable/the independent variable. Method of variation of parameters. Ordinary simultaneous differential equations.

TEXT BOOK :

1. Gorakh Prasad, Differential Calculaus, Pothishala Private Ltd. Allahabad.
2. Gorakh Prasad, Integral Calculus, Pothishala Private Ltd. Allahabad.
3. D.A. Murray Introductory Course in Differential Equations, Orient Longman (India), 1976.

REFERENCES :

1. Gabriel Klambauer, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum's outline series, Schaum Publishing Co. New York.
3. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
4. P.K. Jain and S.K. Kaushik, An Introduction to Real Analysis, S. Chand & Co. New Delhi, 2000.
5. G.F. Simmons, Differential Equations, Tata Mc Graw Hill, 1972.
6. E.A. Codington, An Introduction to Ordinary Differential Equations, Prentics Hall of India, 1961.
7. H.T.H. Piaggio, Elementary Treatise on Differential Equations and their Applications, C.B.S. Publishe & Distributors, Dehli, 1985.
8. W.E. Boyce and P.O. Diprima, Elementary Differential Equations and Boundary Value Problems, John Wiley, 1986.

12. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley and Sons, 1999.

30/5/19

B.A. Part-I

MATHEMATICS

PAPER - III

VECTOR ANALYSIS AND GEOMETRY

VECTOR ANALYSIS:

UNIT-I Scalar and vector product of three vectors. Product of four vectors. Reciprocal Vectors. Vector differentiation. Gradient, divergence and curl.

UNIT-II Vector integration. Theorems of Gauss, Green, Stokes and problems based on these.

UNIT-III General equation of second degree. Tracing of conics. System of conics. Confocal conics. Polar equation of a conic.

UNIT-IV Sphere. Cone. Cylinder.

UNIT-V Central Conicoids. Paraboloids. Plane sections of conicoids. Generating lines. Confocal Conicoids. Reduction of second degree equations.

TEXT BOOKS:

1. N. Saran and S.N. Nigam, Introduction to vector Analysis, Pothishala Pvt. Ltd. Allahabad.
2. Gorakh Prasad and H.C. Gupta, Text Book on Coordinate Geometry, Pothishala Pvt. Ltd., Allahabad.
3. R.J.T. Bell, Elementary Treatise on Coordinate Geometry of three dimensions, Machmillan India Ltd. 1994.

REFERENCES:

1. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Company, New York.
2. Murray R. Spiegel, Vector Analysis, Schaum Publishing Company, New York.
3. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, 1999.
4. Shanti Narayan, A Text Book of Vector Calculus, S. Chand & Co., New Delhi.
5. S.L. Loney, The Elements of Coordinate Geometry, Macmillan and Company, london.
6. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of two Dimensions, Wiley Eastern Ltd., 1994.
7. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of three Dimensions, Wiley Eastern Ltd., 1999.
8. N. Saran and R.S. Gupta, Analytical Geometry of three Dimensions, Pothishala Pvt. Ltd. Allahabad.

भाषाविज्ञान
प्रथम प्रश्न पत्र
भाषा की प्रकृति
(पेपर कोड – 0107)

1. भाषा–मानव एवं मानवेत्तर, संप्रेषण, परिभाषा, विशेषताएं, भाषा विज्ञान की उपयोगिता, भाषा विज्ञान की विभिन्न शाखाएं, भाषा विज्ञान का अन्य विषयों के साथ संबंध ।
2. भाषा सीखने की प्रक्रिया – मौखिक एवं लिखित भाषा के विविध रूप, भाषा बोली के भाषा बन जाने के कारण, भाषाई परिवर्तन के प्रकार एवं कारण ।
3. मनोभाषाविज्ञान –भाषा एवं मस्तिष्क, मस्तिष्क में भाषा के अवयय, स्थानीयकरण, भाषित व्यतिक्रम अस्पष्टार्थकता, अनकार्थकता ।
4. भाषा एवं विचार – भाषा – सामार्थ्य एवं भाषा–व्यवहार, सहजात परिकल्पना, निश्चयवाद – अनुभववाद।
5. हिन्दी भाषा का उद्‌भव और विकास, हिन्दी की उपभाषाएं तथा विविध बोलियां छत्तीसगढ़ी की विशेषताएं ।

निर्धारित पुस्तकें –

1. सैद्धांतिक भाषाविज्ञान – जे. लियांस (अनवाद– सत्यकाम वर्मा)
2. सामान्य भाषाविज्ञान – रॉबिंस
3. सामान्य भाषाविज्ञान – बाबूराम सक्सेना
4. भाषाविज्ञान – भोलानाथ तिवारी
5. भाषा , विचार और वास्तविकता – बेंजामिन ली होर्फ
6. भाषाविज्ञान – राजमल बोरा
7. भाषा विज्ञान सैद्धांतिक चितंन – रविन्द्रनाथ श्रीवास्तव

8- Philosophy of Language and – S. Chopman, Routledge, London.
9- An Introduction to Language and – A. Akimajian (etal.)
10- Communication – Met Press Massachusetts, 1990/1996

(Indian Repoint] Prentice Hall] 1996)

द्वितीय प्रश्न पत्र
ध्वनि और शब्द अभिरचना
(पेपर कोड – 0108)

1. ध्वनि विज्ञान –स्वरूप एवं शाखाएं, वाग्यंत्र की संरचना एवं कार्य, स्वर तथा व्यंजन की परिभाषा एवं अंतर।
2. स्वर – वर्गीकरण के विभिन्न आधार, मान स्वर – त्रिकोण, प्रधान एवं गौण मान संध्यक्षर (संयुक्त स्वर)
3. व्यंजन– वर्गीकरण के विभिन्न आधार, संयुक्त व्यंजन, अंतर्राष्ट्रीय ध्वन्मात्मक प्रतिलिति चिह्न (आई.पी.ए.)
4. अक्षर एवं ध्वनि गुण – मात्रा, बलाघात, सुर अनुतान (सुर लहर), संग्रम, व्यतिरेकी विवरण, परिपूरक विवरण सह स्वनों का निर्धारण ।
5. शब्द परिभाषा, वर्गीकरण, हिन्दी में आगत शब्दावली, शब्द समूह में परिवर्तन –कारण एवं दिशाएं (प्रकार)

निधार्रित पुस्तकें –

1. ध्वनि विज्ञान – गोलोक बिहारी धल
2. स्वन विज्ञान – चतुर्भुज सहाय
3. भाषा विज्ञान – भोलानाथ तिवारी
4. शब्दों का अध्ययन – भोलानाथ तिवारी
5. हिन्दी का नवीनतम बीज –व्याकरण – रमेश चंद्र महरोत्रा एवं चित्तरंजन कर
6. Linguidyice : An Introduction – A. Rad Ford (end al.), Cambridge University Press, 1999
7. A Course in Phonetics - P. Lodefoged, Hardcourt Brace Jovanovich New York, 1993.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

संशोधित पाठ्यक्रम – बी.ए. प्रथम वर्ष के अंतर्गत

सत्र 2019 – 20

विषय – नृत्य (भरत नाट्यम)

बी.ए. भाग (1) के लिये इस विषय में प्रायोगिक और सैद्धांतिक दो भाग होगें। प्रायोगिक 50 अंक एवं सैद्धांतिक 100 अंक का होगा। इस हेतु 50–50 अंक के दो प्रश्नपत्र होंगे। प्रत्येक वर्ष के पूर्णांक कुल मिलाकर 150 अंक के होगें।

क्र	विवरण		पूर्णांक	उत्तीर्णांक
1	सैद्धांतिक प्रथम प्रश्न पत्र	–	50	17
2	सैद्धांतिक द्वितीय प्रश्न पत्र	–	50	17
3	प्रायोगिक	–	50	17
		योग	**150**	**51**

सैद्धांतिक (विस्तृत पाठ्यक्रम)

प्रथम प्रश्न पत्र

शीर्षक – नृत्य का इतिहास एवं सामान्य अध्ययन

पेपर कोड (0153)

1. **नृत्य का इतिहास** – सिंधु सभ्यता, वैदिक काल, रामायण एवं महाभारत काल में नृत्य की स्थिति।
2. **पुराणों के आधार पर** – उमाशंकर एवं नटवर श्री कृष्ण की नृत्य संबंधी कथायें – त्रिपुरडाह, उमा तांडव, मोहिनी–भस्मासुर, माखन लीला, कालिया दमन, रासलीला।
3. **नृत्य का अन्य ललित कलाओं से संबंध** – संगीत, साहित्य, चित्रकला एवं मूर्तिकला से संबंध।
4. **नाट्य की उत्पत्ति कथा** – भरत के नाट्यशास्त्र के प्रथम अध्याय में वर्णित।
5. **लोकधर्मी नाट्य परंपरा** – निम्न की संक्षिप्त जानकारी –
   1. रामलीला
   2. रासलीला
   3. भवाई
   4. माच

14/06/19 14/06/19 14/06/19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

सैद्धांतिक (विस्तृत पाठ्यक्रम)

सत्र 2019 – 20

द्वितीय प्रश्न पत्र

शीर्षक – शास्त्रीय नृत्य सिद्धान्त

पेपर कोड (0154)

1.	**ताल की प्रांरभिक जानकारी**	–	1. ताल के दस प्राण। 2. लय – विलंबित, मध्य एवं द्रुत लय।	
2.	**संक्षिप्त जीवन परिचय**	–	भरत मुनि, आचार्य नंदिकेश्वर।	
3.	**नृत्य के अभ्यास से शारीरिक एवं मानसिक लाभ।**			
4.	**भारतीय नाट्य परंपरा में गुरूवंदना का महत्व।**			
5.	**छत्तीसगढ़ी नृत्यों का सामान्य परिचय**	–	1. करमा 3. सुवा	2. ददरिया 4. रीना, परब

<u>प्रायोगिक</u>

1. मौखिक मुद्रा प्रदर्शन – (अभिनय दर्पण के अनुसार)
   (1) शिवस्तुति (2) शिरोभेद (3) ग्रीवाभेद
   (4) दृष्टिभेद (5) असंयुक्त हस्त (6) संयुक्त हस्त

2. कार्यक्रम विभाग –
   (1) शारीरिक अभ्यास
   (2) आरंभिक –05 अड़ऊ भेद
   (पद + हस्त संचालन तीन काल में)
   (3) पूजा नृत्य
   (4) अलारिपु (तिस्त्रजाति)

14/06/19 14/06/19 14/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A. /B.Sc. –I
Subject-Statistics
Paper – I (Paper Code-0803)
PROBABILITY THEORY

Unit-I
Important concepts in probability: Random experiment: trial, sample point and sample space, event, Operations of events, concepts of mutually exclusive and exhaustive events. Definition of probability: classical and relative frequency approach. Richard Von Misses, Cramer and Kolmogrove approachesto probability, merits and demerits to these approaches, any general idea to be given. Discrete probability space, Properties of probability based on axiomatic approaches, Independence of events, Conditional probability, total and compound probability rules, Baye's theorem and its applications.

Unit-II
Random variables: Definition of discrete random variable (rv); probability mass function (pmf) and cumulative distribution function (cdf). Joint pmf of several discrete rvs. Marginal and conditional pmfs. Independence of rvs. Idea of continuous random variables, probability density function, illustration of random variables and its properties. Expectation of a random variable and its properties -moments, measures of location and dispersion, skewness and kurtosis, Moment generating function, raw and central moments, Probability generating function (pgf) and, their properties and uses.

Unit-III
Standard univariate discrete distributions: degenerate, discrete uniform, hypergeometric, Poisson, geometric and negative binomial distributions. Marginal and conditional distributions, Distributions of functions of discrete rvs, reproductive property of standard distributions.

Unit-IV
Univariate continuous distributions and their properties: Uniform, Beta, Gamma, Exponential, Normal, Cauchy, Lognormal. Moment generating function (mgf) : its properties and applications.
Tchebycheff's inequality and applications, statements and applications of weak law of large numbers and central limit theorems.

Unit-V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.
2.Chung, K.L. (1979). Elementary Probability Theory with Stochastic Processes, Springer International Student Edition.
3. Edward P.J., Ford J.S. and Lin (1974): Probability for Statistical Decision-Marketing. Prentice Hall
4. Goon A.M., Gupta M.K. and Dasgupta B.(1999): Fundamentals of Statistics, Vol. I , World Press, Calcutta
5. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, Mc. Graw Hall.

ADDITIONAl REFERENCES:

6. Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.
7.David Stirzaker (1994). Elementary Probability, Cambridge University Press.
8.Feller, W. (1968). An Introduction to Probability Theory and its Applications, Wiley.
9. Hoel P.G. (1971): Introduction to Mathematical Statistics
10. Mayer P.L. (1970): Introductory Probability and Statistical Applications, Addition Wesley
11.Mukhopadhyay, P. (1996). Mathematical Statistics, New Central Book Agency, Calcutta.
12.Parzen, E. (1960). Modern Probability Theory and its Applications, Wiley Eastern.
13Pitman, Jim (1993). Probability, Narosa Publishing House.

Paper – II(Paper Code-0804)
DESCRIPTIVE STATISTICS

Unit - I

Origin and Development of statistical importance, uses and limitations of Statistics. Types of Data: Concepts of a statistics population and sample from a population; qualitative and quantitative data; nominal and ordinal data; cross sectional and time series data; discrete and continuous data; frequency and non-frequency data.

Collection and Scrutiny of Data; Primary data – designing a questionnaire and a schedule; checking their consistency. Secondary data – their major sources including some government publications. Complete enumeration, controlled experiments, observational studies and sample surveys. Scrutiny of data for internal consistency and detection of errors of recording. Ideas of cross-validation.

Presentation of Data: Construction of tables with one or more factors of classification. Diagrammatic and graphical representation of non-frequency data. Frequency distributions, cumulative frequency distributions and their graphical and diagrammatic representation – column diagram, histogram, frequency polygon and ogives. Stem and leaf chart. Box plot.

Unit -II

Analysis of Quantitative Data: Univariate data: Concepts of central tendency or location, and their measures; arithmetic, geometric and harmonic mean, median and mode.

Unit -III

Dispersion and relative measures of dispersion, skewness and kurtosis, and their measures including those based on quartiles and moments. Sheppard's corrections for moments for grouped data (without deviation).

Unit -IV

Bivariate data: Scatter diagram. Product moment correlation coefficient and its properties. Coefficient of determination. Correlation ratio. Concepts of regression. intra - class correlation coefficient with equal and unequal group sizes. Rank correlation – Spearman's and Kendall's measures. Correlation index. Principle of least squares. Fitting of linear and quadratic regression and related results. Fitting of curves reducible to polynomials by log and inverse transformation. Multivariate data: Multiple regression, multiple correlation and partial correlation in 3 variables. Their measures and related results.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.

2.Croxton FE, Cowden DJ and Klein S: Applied General Statistics (1973): Prentice Hall of India.

3.Goon A.M., Gupta M.K., Dasgupta B. Fundamentals of Statistics, Vol. 1(1991) & Vol. 2(2001). World Press, Calcutta.

5.Gupta V.K. and Kapor S.C. : Fundamentals of Mathematical Statistics S. Chand and Sons.

ADDITIONAl REFERENCES:

6.Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.

7. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, McGraw Hill.

8.Snedecor GW and Cochran WG: Statistical Methods (1967) : Lowa State University Press.

9.Spiegel, MR (1967): Theory & Problems of Statistics (1967): Schaum's Publishing Series.

Paper III

Practical: Practical Based on Paper I & II

1. Presentation of data by Frequency tables, diagrams and graphs.
2. Calculation of Measures of Central Tendency, dispersion , skewness and kurtosis
3. Product Moment Correlation and Correlation Ratio
4. Fitting of Curves by the least square method
5. Regression of two variables
6. Spearman's Rank correlation Coefficient
7. Multiple regression of three variables
8. Multiple correlation and partial correlation
9. Evaluation of probabilities using addition and multiplication theorems, conditional probabilities and Bayes theorems
10. Exercises on mathematical expectations and finding measures of central tendency, dispersion, skewness and kurtosis of univariate probability distributions
11. Fitting of univariate and conditional distributions

प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व
Ancient India History, Culture and Archaeology

बी.ए. प्रथम वर्ष

B.A. Part I Year

पाठ्यक्रम
Syllabus

सत्र : 2019–20

Session 2019-20

बी.ए. प्रथम वर्ष

प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व

प्रथम : प्रश्न–पत्र

B.A. Part I Paper I

भारत का राजनीतिक इतिहास (पेपर कोड 0133)

(हड़प्पा संस्कृति से 319 ई. तक)

Political History of India (Harappa Culture to 319 A.D.)

पूर्णांक : 75

उद्देश्य : इस पाठ्यक्रम का उद्देश्य छात्रों को संबंधित कालखण्ड के राजनीतिक इतिहास की समुचित जानकारी देना है।

इकाई– 1 (1) प्राचीन भारतीय इतिहास के स्रोत (Sources of Ancient Indian History)
(2) हड़प्पा तथा समकालीन ताम्राश्म संस्कृतियॉ (Harappa and Contemporary Chalcolithic Culture)
(3) वैदिक युग (Vedic Age)

इकाई– 2 (1) महाजन पद युग (Mahajanpada Age)
(2) मगध साम्राज्य का उत्कर्ष (Rise of Magadha Kingdom)

इकाई– 3 (1) सिकन्दर का आक्रमण और उसके प्रभाव (Alexander's Invasion and it's impact)
(2) मौर्य साम्राज्य का उत्थान और उसके प्रभाव (Rise of Mauryan empire and its impact)

इकाई– 4 (1) हिन्द–यूनानी (Indo-Greeks)
(2) शुंग (Shungas)
(3) सातवाहन (Satvahanas)
(4) शक–क्षत्रप, पार्थियन (Shak-Kshatrapas, Parthiyan)
(5) खारवेल (Kharvela)

इकाई– 5 (1) संगम युग (Sangam Age)
(2) कुषाण (Kushanas)
(3) मालव, यौधेय, अर्जुनायन तथा औदुम्बर (Malavas, Youdheyas, Arjunayana and Audumbara)
(4) नागवंश (Nagas)

सहायक ग्रंथ :

1. एच.सी. रायचौधरी – प्राचीन भारत का राजनीतिक इतिहास
2. के.ए. नीलकंठ शास्त्री – दक्षिण भारत का इतिहास
3. कृष्णदत्त बाजपेयी तथा विमलचंन्द्र पांडेय – प्राचीन भारत का इतिहास
4. विमल चन्द्र पांडेय – प्राचीन भारत का राजनीति तथा सांस्कृतिक इतिहास भाग एक
5. किरन कुमार थप्याल – सैंधव सभ्यता
6. गुलाम, याजदानी (संपा.) – दकन का इतिहास
7. राजबली पाण्डेय – प्राचीन भारत
8. H.C. Roycoudhary - Political History of Ancient India
9. R.C. Majumdar (Ed.) - The Age of Imperial Unity
10. Romila Thaper - History of India
11. K.A, Nilkanta Shastry - History of South India
12. व्ही.डी.झा. सुष्मिता पाण्डेय, डॉ.ओम प्रकाश – Ashoka and the declaim of Moury empire

बी.ए. प्रथम वर्ष

प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व

प्रथम : प्रश्न–पत्र

B.A. Part I Paper II

भारत का राजनीतिक इतिहास (319 ई.से 1300 ई. सन् तक)

Political History of India (From 319 A.D. to 1300 A.D.)

पूर्णांक : 75

उद्देश्य : इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को संबंधित कालखण्ड के राजनीतिक इतिहास का समुचित ज्ञान प्रदान करना है।

इकाई– 1 (1) गुप्तों की उत्पत्ति एवं प्रारंभिक इतिहास (Rise of Guptas and their early History)
(2) चन्द्रगुप्त प्रथम, रामगुप्त, समुद्रगुप्त (Chandragupta – I, Ramagupta, Samudragupta)
(3) कुमारगुप्त प्रथम, स्कन्दगुप्त (Kumargupta – I, Shandgupta)
(4) वाकाटक राजवंश, गुप्त–वाकाटक सम्बन्ध (Vakataka Dynasty, Gupta Vakataka relation)

इकाई– 2 (1) परवर्ती गुप्त राजवंश (Later Gupta Rulers)
(2) मौखरी (Maukharis)
(3) वर्धन राजवंश और हर्ष का प्रशासन (Vardhana Dynasty and Administration of Harsha)

इकाई– 3 (1) बादामी के चालुक्य (Chalukyas of Badami)
(2) कांची के पल्लव (Pallavas of Kanchi)
(3) चोल तथा उनका प्रशासन (Cholas and their administration)

इकाई– 4 (1) गुर्जर प्रतिहार (Gurjara Pratihara)
(2) राष्ट्रकूट (Rashtrakutas)
(3) पाल (Palas)
(4) गाहड़वाल (Gahadwalas)

इकाई– 5 (1) चन्देल (Chandela)
(2) परमार (Parmaras)
(3) चाहमान (Chahmanas)
(4) त्रिपुरी के कलचुरि (Kalachuris of Tripuri)
(5) रतनपुर के कलचुरि (Kalachuris of Ratanpur)

अनुशंशित पुस्तके :

1. उदयनारायण राय – गुप्त राजवंश तथा उसका इतिहास (नया संस्करण) 1988
2. श्री राम गोयल – भारत का राजनैतिक इतिहास भाग 2 एवं 3
3. श्री राम गोयल – गुप्त साम्राज्य का इतिहास
4. Ashvini Agrawal - Rise and Fall of the imperial Gupta
5. विशुद्धानंद पाठक – उत्तर भारत का राजनीतिक इतिहास
6. अवध बिहारी लाल अवस्थी – राजपूत राजवंश
7. डी.सी.गांगुली – परमार राजवंश
8. भगवती प्रसाद पांथरी – मौखरी और पुष्यभूमि राजवंश
9. डॉ.के.ए.नीलकंठ शास्त्री – दक्षिण भारत का इतिहास
10. डॉ.बैजनाथ शर्मा – हर्षवर्धन
11. R.C. Majumdar & A.D. Pusalkar (Ed.) - The Classicale Age "The age of Imperial Unity" The Strangle for Empire
12. Majumdar, Roy Choudhary - An Advanced History of India Vol. I

DEFENCE - STUDIES

PAPER - I

INDIAN MILITARY HISRORY M.M. 50

(Paper Code-0143)

AIM : The main idea behind this paper is to give a conceptual background about the events and factors which infleenced course of history and helped in developing the art of war in India.

Note : Questions will be set from each unit, There will be only internal choice.

UNIT-1 1. The definition and scope of Defence Studies and its relationship with other sub-jects.

2. Art of war of Epic and Puranic period.
3. Comparative study of lndo-Greek art of war with special reference to the Battle of Hydaspus 326 B.C.
4. Mauryan Military system and art of war.

UNIT-2 1. Kautilya's Philosophy of war.

2. Gupta's military system and art of war.
3. Military system of Harshavardhan.
4. Dicline of Chariots and Importance of Elephant and Cavalory.

UNIT-3 1. Mughal military system.

2. Rajput and Turk pattern of warfare with specil of reference to Battle of Somnath and Battle of Tarain up to 12th century A.D.
3. Causes of the fall pf Rajput Military system.
4. Army organization during Sultanate period.
5. Battle of Panipat 1526 A.D. and Battle of Haldighati 1576 A.D.

UNIT-4 1. Maratha Military system.

2. Warfare of Shivaji.
3. Battle of Assaye 1803 A.D.
4. Sikh Military system.
5. Battle of Sobraon 1846 A.D

UNIT-5 1. 1857 Liberation Movement.

2. Reorganizations of Indian Army under the Crown.
3. Nationalization of, Indian Army after independence.
4. Military reforms of Lord Kitchner's.

READING LIST :

1.	Military System of Anciant India	:	B.K. Majumdar
2.	Generalship of Alexander the Great	:	J.F.C.Fuller
3.	Kautilya Arthashastra	:	K.P. Kanbley
4:	Military history of India	:	J.N. Sarkar

PAPER - II

DEFENCE MECHANISM OF THE MODERN STATE

(Paper Code-0144)

AIM : To enable students to appreciate the importance of higher political direction in the for-mulation of national defence policy and roles as political and military leadership in fur-thering national security.

Note : Question will be from each unit, there will be only internal choice.

UNIT-1 1. Evolution of National defence policy.

2. Inter dependence of Foreign, Defence and Economics policies.
3. Higher defence organization of U.S.A., U.K. and RUSSIA.
4. Higher defence organization of CHINA, PAKISTAN and NATO.

UNIT-2 1. Higher defence organization in India.

2. Powers of President and relation to Armed forces.
3. Parliament and the Armed forces.
4. Defence (Political affair) committee of the cabinet. Its composition, methods of working during war and peace.
5. National Defence Council and its Valiant.

UNIT-3 1. Organization of Ministry of Defence.

2. Organization of Army head quarter.
3. Organization of Naval head quarter.
4. Orgatiization of Air head quarter.

UNIT-4 1. Organization and role of Para-militaty forces - B.S.F., I.T.B.P., C.I.S.F. etc.

2. Organization and role of Intelligence Agencies - RAW, CBI, CID., IB etc.
3. Military Intelligence.
4. Role of N.C.C. in preparing youth for Defence services.

UNIT-5 1. Organization of Civil - defence.

2. Importance and role of civil defence during war and peace.
3. Air-Raid signal and precaution before and after bombardment.
3. Role of Indian armed forces in war and peace.

READING LIST :

1. Indian Army, A Sketch of its History & Organisation : E.H.E. Choen
2. Defence Organization in India : Venkateshwarm

PRACTICAL **M.M. : 50**

There shall be practicall examination ot 3 hours duration and carying 50 marks. The distri- bution of marks shall be as follows -

1. Exercises based on Map reading : 20 Marks
2. Exercises based on models : 10 Marks
3. Sessional Work and Record : 10 marks
4. Viva-Voce : 10 marks,

PART - A

ELEMENTARY MAP READING

1. Maps- Difination, types, Marginal Information.
2. Conventional signs - Military and Geographical.
3. Direction and cardinal points.
4. Types of North, Angle of Convergence.
5. Study of Liquid compass, its parts, various tactical uses and preparation of Night navigation chart.
6. service Protractor and its uses.
7. To find North by Compass, Watch, Sun, Stars etc.
8. Bearing and interconversion of bearing.
9. Setting of Map.
10. Grid System.

PART - B

RECOGNITION & ELEMENTRY STUDY OF FOLLOWING MODELS

1. equivalent Rank and Badges of Indian Army, Navy and Air Force.
2. Famous Armoured vehicles used in war.
3. Weapons used in Infantry.
4. Various Ships of Indian Navy.
5. Famous Air-Crafts Used by Air-Force.

पाठ्यक्रम उर्दू निसाब

नोट : इस इम्तेहान में दो पर्चे में 75 नम्बर पर मुशतमिल होगा।

1. नस्र
2. नज्म

पहला पर्चा
नस्र(पेपर कोड– 0129)
(सवानेह, खाके, इन्शाईये)

निसाब

1. सवानेह :

1. गालिब के सवानेही हालात –' यादगारे गालिब ' के मुसन्निक अल्लाफ हुसैन हाली
2. शिब्ली की बेनियाजी और खुद्दारी शिब्ली ' से सैयद सुलेमान नदवी
3. नजीर अहमद की कहानी : ' कुछ मेरी, कुछ उनकी जबानी ' मुसन्निव फरहत उल्ला बेग

2. खाके :

1. नामदेव माली : चन्द्र हम अस्र से मुसन्निव मौलवा अब्दुल हक
2. हकीम अजमल खां : 'खिमालिस्तान ' सज्जाद हदर यलद्रम'
3. अकबर इलाहाबादी :इन्शाएं माजिद हिस्सा–2 मुसन्निफ अब्दुल माजिद दरयावादी
4. जिगर साहब : 'सहाब' से मुसन्निफ मोहम्मद तुफैल
5. मौलाना अब्बुल कालाम आजाद : 'अब्बुल कालाम आजाद' से मुसन्निफ ख्वाजा सहन निकामी

3. इन्शाईये :

1. तास्सुब : 'मजामीने सर सैयद' सर सैयद
2. मुझे मेरे दोस्तों से बचाओ : 'खिमालिस्तान' सज्जाद हदर यलद्रम
3. शहजादे का बाजार में घिसटना : गदरे देहली के अफसाने सुसन्निफ सहन निजामी
4. स्बेरे जो कल आंख मेरी खुली : 'मजामीने पितरस' अज पितरस बुखारी
5. बरसात : निगारिस्तान अज नियाज फतहपूरी
6. शायर होना क्या माने रखना है : अज रशीद अहमद सिद्दीकी

पर्चा प्रथम

नोट : मुन्दरजा बाला पर्चा पांच इकाईयों में तफसीम होगा ।

इकाई–1

1. सवाने, निगारी, खाका निगारी और इन्शाईया निगारी पर सवालात 15 नंबर
2. शामिले निशाब हसबाफ पर सवाल 15 नंबर
3. शामिले निशाब खाकों पर सवालात 15 नंबर
4. शामिले निशाबइन्शाईयों पर सवालात 15 नंबर
5. शामिले निशाब असबाफ सवानेही और इन्शाईयों में इक्तेबायात की तशरीह 15 नंबर

पर्चाद्वितीय (शायरी)
गजलियात
(पेपर कोड – 0130)

निसाब :

(1) बली :

1. याद करना हर घड़ी उस यार का
2. शराबे शौक से सरशार हैं हम

(2) मीर तरी मीर :

1. उल्टी हो गई सब तदवीरें
2. मुहं तकाही करें है जिस तिस का

(3) गालीब :

1. दिल ही ताक है न संगो खिश्त दर्द से भर आये क्यो
2. यह न थी हमारे किस्मत के विसाले यार होता

(4) मौमिन :

1. अगर उसकी जरा नहीं होता
2. गैरो पर खुल न जाएं कही राज देखना

(5) आतिश :

1. मगर उसको फरेबे नर्गिये मस्ताना आता है
2. हवाएं दौरे गए खुशगवार राह में है

(6) दाग देहलावी :

1. खातिर से या खअयाल से मैं मान तो गया
2. गाब किया तेरे बादे पे एतेवार किया

(7) सिरज मिर खां सैहर

1. सोने में दिल है दिल में दाग
2. वक्ते जिबाह मुहं फिर गया शमशीरे कातिल का

(8) डॉ. इकबाल

1. कभी ये हकीकते मुसुन्तजिर नजर आ लिबाजे गजाज
2. फिर चरागे लाबा से रोशन हुए कोहो दमन

(9) हसरत मौहानी

1. रस्मे जफा कामयाब देखिए कब तक रहे
2. हुस्ने बे परवा को कुद बीन खुद आरा कर दिया

(10) फानी बदायूरी

1. खल्क कहती है जिसे दिल तेरे दिवाने का
2. दुनियां मैरा बला जाने मेंहगी है के सस्ती है

(11) जिगर मुरादाबादी

1. दिल गया रोकने हायत गई
2. सेरले खिदर ने दिल यह दिखाएं

(12) फराक गौरखपुरी

1. निगारे नाज दे पर्दे उठाए है क्या–क्या
2. बहुद पहले से उन कदमों की आहट जान लेते है

(13) मजरूम सुलतान पुरी

1. जला के मशअले जॉ हम जुन सिफात चले
2. मुझे सहल हो गई मंजिले

(14) ताल भोपाली

1. मैं हूं गदाए हुस्न न यूँ हॅस के टाल दे
2. है अजब भीड़ भाडत्र सड़कों पर

(15) जॉ निसार अख्तर

1. हम से भागा न करो दूर गजालो की तरह
2. न ख्वाब, खलिश न खुमार यह आदमी तो कोई सानेहा लगे है मुझे

(16) खलील उर्रेहमान आंजमी

1. हम जिन्दगी की साज पे गाते रहे नगमा तेरा
2. मै सूने मकान का दिया हूं

(17) फजला ताबिशं

1. एक दो धोखे हो तो यारो दिल रखने को खा भी लो
2. न कर शुमार के हर शै गिनी नहीं आती

इकाईयां : इकाई नं.

1. गजल से मुजाल्लिक सवालात 15 नम्बर
3. कदीम शुअरा पर तन्दीकी सवालात 15 नम्बर
4. जरीद गजल गो शुअरा पर सावालात 15 नम्बर
5. कदीम गजल गो शुअरा के अशआर की तशरीह 15 नम्बर
6. जदीद गजल गो शुअरा के अशआरकी तशरीह 15 नम्बर

B.A. PART-I

HOME SCIENCE PAPER – I

ANATOMY PHYSIOLOGY & HYGIENE

M.M.: 50

(Paper Code-0121)

NIT-1 Structure & functions of cell general introduction of Tissue and their functions skeletal system - Types of bones, classification general structure & functions of bones. Muscular system - General structure, types and function.

UNIT-2 Circulatory system - General structure of organs and functions, composition of blood & function. Respiratory system - General structure of organs and functions.

UNIT-3 Digestive system - General introduction of Nutrients, Liver and spleen organs of digestion their general structure and function. Excretory system - organs of excretion. Kidney & skin - structure & function.

UNIT-4 Nervous system - Central nervous system structure and function. Senses and Sensory organs - ear and eye structure & function.

UNIT-5 Hygiene - Personal Hygiene

Social Hygiene

Environmental and Industrial

Hygiene Water - its importance and

purification. Air - its importance and

purification.

First aid home nursing - Principles, qualities of nurse, Responsibilities, selection of sick room, care of the patient. Some common accidents and their aid, poison, bleeding, Burns and scalds, fracture sprain, dislocation.

13.06 13/6/19 13.06.19

HOME SCIENCE

Paper – II

HOME SCIENCE - EXTENSION EDUCATION

(Paper Code-0122)

UNIT-1 Introduction of Home Science Extension Education:

(A) Home Science - Concepts, goals and Areas of Home Science & their inter relationship with extension.

(B) Principles and methods of home science extension education general concepts of extension work.

(C) Objectives of extension education qualities of extension workers, extension education process.

UNfT-2 Community Development problems and Role of Home Scientists:

(A) Principles of community development organization and function of community development.

(B) Role of home scientists in community development, programmes of extension education for community, programmes of community development at central, state, district, block and village level.

Family plalnning programme.

Community problems, child marriage, Dowery system, parda pratha, rural indibtendness unemployment.

UNIT-3 Teaching methods & aids:

Methods of learning - Discussion, demonstration, observation and their application to home science teaching.

Extension Methods - their scope advantages and application.scope and use in Home Science teaching

Extension Methods - their scope advantages and application.

UNIT-4 Attitude towards Home Science:

Attitudes towards Home Science, Motivation towards Home Science. Application of Home Science towards improvement in family living. Job opportunities in Home Science National and International agencies and their

13.6.19 13.06.19

collaboration with Home Science, Official organization Home Science Association of India, W.H.O. FAG, CARE, ICAR, ICDS, ICSSR, ICMR, IRDR Adult education.

UNIT-5 **Curriculum Planning in Home Science**:

Basic concept of curriculum planning comporrents of curriculum planning imple. Mentation evoluation' and improvement required in the existing system of H.Sc. education policy and its relevance to H.Sc. Programme planning- concept, principles objectives and steps in programme planning.

REFERENCE:

1. Extension -education and community development by Dhama O. P.
2. Co-operative Extension Work by Kelsey, L.D. and rleame C. R.
3. Extension education, Shri Lakshmi press by Reddy A. A.
4. An Introduction to programme evaluation John Wiley. Fracklin, J.K. & Thrashe / J.H.

13/6 13.6.19 13.06.19

प्रायोगिक

कुल समय 3 धंटे　　कुल अंक–50

अंको का विभाजन

1.	स्पेशल	10
2.	प्राथमिक उपचार	10
3.	गृह परिचर्या	15
4.	शरीर रचना एवं स्वास्थ्य विज्ञान	15

स्पेशल :(परीक्षा के समय छात्राऐं प्रायोगिक नोट बुक एवं उपचार पेटी जमा करें ।)

प्रयोग कमांक –1 रिर्पोट : कालेज की कक्षाओं का प्रतिदिन की सफाई एवं वायुविजन संबंधित निरीक्षण।

प्रयोग कमांक – 2 स्वयं के परिवार में पीने के पानी के प्राप्ति के साधन, संग्रह के प्रकार एवं साधन पानी की शुद्ध एवं स्वच्छता के लिये प्रयुक्त विधि।

प्रयोग कमांक –3 रिर्पोट : स्वयं के परिवार एवं अन्य दो पड़ोसी परिचत्रवार के घर में अगस्त से दिसम्बर (अनुमानत : पांच महीने) के दौरान हुई बीमारियों के संबंध में जानकारी ।

1. रोग का नाम ।
2. प्राथमिक उपचार– जो दिया गया।
3. आहार (जो उपयोग में लाया गया)

प्रयोग कमांक – 4 प्राथमिक उपचार पेटी (आवश्यक सामान)

1. घाव धोने एवं बांधने का सामान।
2. दर्द कम करने की दवाईयां।
3. अपाचन– में प्रयुक्त दवाईयां।

प्राथमिक उपचार पेटी छात्राएं परीक्षा के समय अपना नाम एवं परिवार के सदस्यो की संख्या लिखकर प्रस्तुत करें।

प्रयोग कमांक – 5 रोगी के लिये उपचारात्मक व्यंजनो का अध्यापक द्वारा करके बताना।

1. सब्जियों का सूप।
2. दाल का सूप।
3. उबला अंडा।
4. फटे दूध का पानी (व्हे वाटर)
5. सब्जी एवं फलों का स्टू

इन व्यंजनो की विधि एवं उपयोगिता नोट बुक में अंकित की जावेगी।

प्रयोग कमांक – 6 प्राथमिक उपचार

1. विभिन्न प्रकार की पट्टियां (तिकोनी, गोल)
2. घाव की देखभाल।
3. कृत्रिम श्वसन।

13.6　13/6/19　13.06.19

प्रयोग कमांक – 7 गृह परिचर्या

1. शरीर के तापमान का चार्ट
2. गरम एवं ठंडे पानी की थैली तैयार करना।
3. बिस्तर लगाना/चद्दर बदलना।

प्रयोग कमांक– 8 दृष्य श्रव्य यंत्र का बनाना।

महत्वपूर्ण निर्देश– प्रयोग कमांक 1, 2, 3 तथा 5 की रिपोर्ट छत्राओ द्वारा प्रायोगिक नोट बुक में लिखकर एवं अध्यापक द्वारा प्रति हस्ताक्षरित/प्रमाणित करवाकर परीक्षा के समय प्रस्तुत की जावेगी।

13/6/19 13.06.19

INSURANCE PRINCIPAL & PRACTICE (Paper Code-0139)

PAPER - I

LIFE INSURANCE : **M.M. : 50**

UNIT-1 Introduction :

Need for security against economic difficulties, Risk and uncertinty, Individual value system, Individual, Life Insurance Nature and uses of Life Insurance, Life Insurance as a collateral, as a measure of financing business continuation, as a protection to property, as a measure of investment.

UNIT-2 Life Insurance Contract :

Distinguishing characteristics, Utmost Good Faith, Insurable Interest, Caveat Emptor, Unilateral and alleatory nature of contract, proposal and application form, Warranties Medical examination, policy construction and delivery, policy provision, lapse revival, surrender value, paid-up policies, maturity, nomination and assignment. Suicide and payment of insured amount, Loan, to policy holders.

UNIT-3 Life Insurance Risk :

Factors governing sum assured, Methods of calculating economic risk in life insurance proposal. Measurement of risk and mortality table, Calculation of Premium, Treatment of sub-standard risks. Life Insurance Fund, valuation and investment of surplus, Payment of bonus.

UNIT-4 Life Insurance Policies :

Types and their applicability to different. Situations, Important life Insurance Policies issued by the life Insurance Corporation of India. Life Insurance annuities. Important legal provisions and judicial pronouncements in India.

UNIT-5 Salesmanship in Life Insurance :

Rules of agancy Essential qualities of an ideal insurance salesman, Rules to canvass business from prospective customers, After-sale service to policy holders.

GENERAL INSURANCE (Paper Code-0140)

PAPER - II **M.M. : 50**

UNIT-1 1. Introduction to risk and insurance.

(A) Risk (B) The treatment of Risk

2. The structure and operation of the insurance business.

UNIT-2 (a) Insurance contract fundamentals.

(b) Insurance marketing.

(c) Insurance loss payment.

(d) Underwriting, rating, reinsurance, and other functions.

UNIT-3 General Insurance corporation and other Insurance institutions.

Working of GIC in India; Types of risks assumed and specific policies issued by ECGC.

UNIT-4 Health Insurance :

(a) Individual health insurance.

(b) Group health insurance.

UNIT-5 (a) Motor Insurance.

(b) Multiple line and all lines Insurance such as rural Insu-rance - Hull Insurance-etc.

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FUNCTIONAL ENGLISH

(Paper Code-0137)

PAPER - I **M.M. : 50**

UNIT-1 (a) Linguastics and Phonetics.
(b) Phonology.

UNIT-2 (a) The Organs of Speech
(b) Speech Sounds - Vovels and Consonants

UNIT-3 Consonant Clusters in English

UNIT-4 Phonetic symbols

UNIT-5 Transcriptions

Based on a text of English Phonetics for Indian students by Balsybramanium.

FUNTIONAL ENGLISH

(Paper Code-0138)

PAPER - II **M.M. : 50**

UNIT-1 Articles, Parts of Speech, Linking Verbs Nagative sentences.

UNIT-2 Questions, Agreement of verb and subject, Transitive and Intrasitive regular and in-
regular verbs.

UNIT-3 Tenses

UNIT-4 Question Tags, Transformetin Active and Passive Voice, Direct and Indirects S

UNIt-5 Common Errors in English.

Based on F.T. words Grammer

Dr. M. Chakraborty DR. S. Gupta DR. MERILY ROY

VIVA - VOCE

SYALLABUS FOR THEORY AND PRACTICAL

(Drawing and painting) **M.M. 50**

B.A. (Drawing and painting) course is divided into three parts : B.A. 1st year, B.A. IInd year, B.A. III Year, all Examination is conducted by University for all class Maximum marks will be 150 the three parts details are as under :-

B.A. Ist Year

SESSION – 2019-20

THEORY FUNDAMENTAL OF PAINTING (ART)

The Time Of Theory Paper Is Three Hours **M.M. : 50**

1. Defination of Art
2. Classificaction of Art
3. Elements of painting - Line, Form, Colour, Tone, Texture, Space.
4. Shadang - Rupa Veda, Pramanani, Bhava, Labanya, Yojan, Sadrusya, Varnika Bhang.

BOOK RECOMMENDED :

1.	Still life Painting	-	Richmend.
2.	Akar Kalpna	-	Ranbir Saxana
3.	Chirta Sayanjan	-	P. N. Choyal
4.	Kala ke mull Tatya	-	Dr. C. L. Jha

14/06/19

PRACTICAL

There will be Two Practical Paper Evalution will be made by the external and the internal examiners. Together, and Sessional Marking is made by the class Teacher.

* The time of each paper is four hour's and there will be a half hour's recess in between.

STILL LIFE

(Paper Code-0150)
PAPER – I
SESSION – 2019-20

Scheme of Examination
Time - 4 Hours
Paper - 1/4 Imp Size
Meldium - Water Colour

Total Mark - 50
Exmination - 40
Sessional - 10

Class Work - Minimum work to be Submitted. Five Paining Size 1/4 IMP
Any type of still object will be dreown books, flower pot's Frouts etc.

BASIC DESING

(Paper Code-0150 A)
PAPER – II
SESSION – 2019-20

Scheme of Examination
Time - 4 Hours
Paper - 1/4 Imp Size
Meldium - Water Colour or Poster Colour

Total Mark - 50
Exmination - 40
Sessional - 10

Class Work - Minimum work to be Submitted. Five Paining Size 1/4 IMP
Form of netural element and object will be decoreted and repeated. Form like Flower, leaf, fruits, pot. Boll and Geometrial desing will be drown and painted with water colour and poster colour.

10/06/19

B.A. EDUCATION PART - I

PAPER - I

EDUCATION AND SOCIETY **M.M. 75**

(Paper Code-0123)

COURSE OBJECTIVES

To enable the students to understand -

1. The general aims of Education alongwith Nature types and Scope of educations.
2. Meaning of Major Philosophies of education and function of education.
3. Meaning of curriculum and its Planning and Construction.
4. The Importance of Play and activity oriented education and Modern Methods of Teaching.
5. Specific aims of education as per the present day needs.

UNIT-1 Nature and Scope of Education, Education as a Science, Education as a Social
Process, Factors of Education.

- Aims of Education-Individual, Social, Vocational and Democratic.
- Formal, informal and non formal agencies of education, Relation between School and Society.

UNIT-2

- School a Miniature Society.
- Education and State-To talitarian and Democratic concepts, State Control over Education, Nature.
- Centralization and Decentralization.

UNIT-3

- Curriculum definition, Types of Curricula. Principles of Curriculum Construction,
- Child Centred and Life Centred Curricula.
- Co-Curricular activities.
- Education and Craft, Principle of Basic Education.
- Freedom and Discipline, Need of discipline in and out of school, discipline and
- Order, Free disciplin

UNIT-4

.

- Value Education, MEaning of Human Values. Their development, Some Transactional Strategies.

UNIT-5 Education for National Integration, I nternational understanding and education
for Human resource development, Education for Licture.
Secularism and Education.

Shiksha Sidhant - Pathak and Tyagi - Vinod Pustak Mandir, Agra.

PAPER - II
PROBLEMS OF EDUCATION
(Paper Code-0124)

M.M. 75

UNIT-1 ● Problems and suggestions for improvement in Primary Educn.

- Problems and suggestions for improvement in Secondary Educn.

UNIT-2 ● Problems and Suggestions for improvement in Higher Educn.

- Problems and Suggestions for improvement in Teacher Educn.

UNIT-3 ● Problems and Suggestions for improvement in Women Educn.

- Problems and Suggestions for improvement in Adult Educn.

UNIT-4 ● Problems and Suggestions for improvement in Technical Education.

- Problems and Suggestions for improvement in Distance Education.

UNIT-5 ● Problems and Suggestions for improvement in Population Education.

- Problems and Suggestions for improvement in Environmental Education.

BOOK RECOMMENDED :

1. A. Mishra - The Financing of Indian Education.
2. Nurullah and Naik - A History of Education in India.
3. S. N. Mukherjee - Education in India Today and Tomorrow.
4. K.G. Saiyad - Problems of Education Reconstruction.
5. Mahatma Gandhi - Our Language Problems.
6. S.R. Dongerkerry - University and their Problems.
7. R.V. Parulacker - Literacy in India.
8. G. Ghaurasia - New Era in Teacher Education.
9. J.P. Naik - Education Planning in India.
10. J.C. Agrawal - Progress of Education in India.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 2960/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–दो के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

———00———

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–दो के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2020–21 से लागू किये जाते हैंः–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान
2. बी.एस–सी.– आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.ए./बी.एस.सी (गृह विज्ञान) – आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।

उपरोक्त विषयों को शिक्षा सत्र 2020–21 से संशोधित रूप में स्नातक स्तर भाग–दो के लिए लागू किया जाता है स्नातक स्तर भाग–एक हेतु सत्र 2019–20 में लागू पाठ्यक्रम मान्य होंगे एवं भाग – तीन के पाठ्यक्रम यथावत रहेंगे।

टीपः– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय के परीक्षा विभाग एवं वेबसाईट पर प्रकाशित करने हेतु वेबसाईट प्रभारी को उपलब्ध करा दी गई है।

कुलसचिव

क्र. 2961/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 परिपेक्ष्य में सूचनार्थ।
2. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-Ii examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the thirdyear.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-Iexamination.

3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognised by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIexamination.

4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIIexamination.

5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department orCollege.

6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in-

   (i) Foundation Course:

   (ii) Any one of the following combinations of three subjects:-

      1. Physics, Chemistry &Mathematics.
      2. Chemistry, Botany &Zoology.
      3. Chemistry, Physics &Geology.
      4. Chemistry, Botany &Geology.
      5. Chemistry, Zoology &Geology.
      6. Geology, Physics &Mathematics.
      7. Chemistry, Mathematics &Geology.
      8. Chemistry, Botany & DefenceStudies.
      9. Chemistry, Zoology & DefenceStudies
      10. Physics, Mathematics & DefenceStudies.
      11. Chemistry, Geology & DefenceStudies

12. Physics, Mathematics &Statistics
13. Physics, Chemistry &Statistics
14. Chemistry, Mathematics &Statistics.
15. Chemistry, Zoology &Anthropology.
16. Chemistry, Botany &Anthropology.
17. Chemistry, Geology &Anthropology.
18. Chemistry, Mathematics &Statistics.
19. Chemistry, Anthropology & DefenceStudies.
20. Geology, Mathematics &Statistics.
21. Mathematics, Defence Studies &Statistics
22. Anthropology, Mathematics &Statistics
23. Chemistry, Anthropology & AppliedStatistics
24. Zoology, Botany &Anthropology
25. Physics, Mathematics &Electronics.
26. Physics, Mathematics & ComputerApplication
27. Chemistry, Mathematics & ComputerApplication
28. Chemistry, Bio-Chemistry &Pharmacy
29. Chemistry, Zoology &Fisheries.
30. Chemistry, Zoology &Agriculture
31. Chemistry, Zoology &Sericulture
32. Chemistry, Botany & EnvironmentalBiology
33. Chemistry, Botany &Microbiology
34. Chemistry, Zoology &Microbiology
35. Chemistry, Industrial Chemistry &Mathematics
36. Chemistry, Industrial Chemistry &Zoology
37. Chemistry, Biochemistry,Botany
38. Chemistry, Biochemistry,Zoology
39. Chemistry, Biochemistry,Microbiology
40. Chemistry, Biotechnology,Botany
41. Chemistry, Biotechnology,Zoology
42. Geology, Chemistry &Geography
43. Geology, Mathematics &Geography
44. Mathematics, Physics &Geography
45. Chemistry, Botany &Geography

(iii) Practical in case prescribed for coresubjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to thateffect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/ group of subjects. In subject/ group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examinationseparately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementaryexamination.

10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the ThirdDivision.

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SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks	Total Marks	Min. Marks
C	Environmental Studies		75	100	33
	Fild Work		25		
Foundation Course					
	Hindi Language		75	75	26
	English Language		75	75	26

नोटः– प्रत्येक में से 02 (दो) प्रश्न करने होगें । सभी प्रश्न समान अंक के होगें।

Three Elective Subject :

1.	Physics	I	50	100	33
		II	50		
		Practical		50	17
2.	Chemistry	I	33		
		II	33	100	33
		III	34		
		Practical		50	17
3.	Mathematics	I	50		
		II	50	150	50
		III	50		
4.	Botany	I	50	100	33
		II	50		
		Practical		50	17
5.	Zoology	I	50	100	33
		II	50		
		Practical		50	17
6.	Geology	I	50	100	33
		II	50		
		Practical	50		17
7.	Statistics	I	50	100	33
		II	50		
		Practical		50	17
8.	Anthropology	I	50	100	50
		II	50		
		Practical		50	17

Subject	Paper	Max. Marks	Total Marks	Min. Marks
CompulsorySubject–FoundationCourse:				
9. DefenseStudies	I	50	100	33
	II	50		
	Practical		50	17
10. MicroBiology	I	50	100	33
	II	50		
	Practical		50	17
11. ComputerSciences	I	50	100	33
	II	50		
	Practical		50	17
12. Information Technology	I	50	100	33
	II	50		
	Practical		50	17
13.IndustrialChemistry	I	34		
	II	33	100	33
	III	33		
	Practical		50	17
14. BioChemistry	I	50		
	II	50	100	33
15.BioTechnology	Practical	50	50	17
	I			
	II	50	100	33
	Practical		50	17

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examnination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986.

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the University or examination centres.
3. Calculators with, memoty and following variables be permitted +, -, x, ¸ square, reciprocal, expotentials log, square root, trignometric functions, wize, sine, cosine, tangent etc. factiorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

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संशोधित पाठ्यक्रम
बी.ए./बी.एस–सी./बी.कॉम./बी.एच.एस.–सी.
भाग – दो, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा) (पेपर कोड – 0171) **पूर्णांक– 75**

खण्ड – क निम्नलिखित 5 लेखकों के पाठ शामिल होंगे – **अंक–35**

1. महात्मा गांधी	–	चोरी और प्रायश्चित
2. आचार्य नरेंद्र देव	–	युवकों का समाज में स्थान
3. वासुदेव शरण अग्रवाल	–	मातृभूमि
4. हरि ठाकुर	–	डॉ. खूबचंद बघेल
5. पं. माधवराव सप्रे	–	सम्भाषण–कुशलता

खण्ड–ख हिन्दी भाषा और उसके विविध रूप **अंक–16**

1. कार्यालयीन भाषा
2. मीडिया की भाषा
3. वित्त एवं वाणिज्य की भाषा
4. मशीनी भाषा

खण्ड–ग हिन्दी की व्याकरणिक कोटियॉ **अंक–24**

संज्ञा, सर्वनाम, विशेषण, क्रिया विशेषण,
समास, संधि एवं संक्षिप्तियां
अनुवाद व्यवहार : अंग्रेजी से हिन्दी में अनुवाद

इकाई विभाजन–

इकाई– 1 चोरी और प्रायश्चित : महात्मा गांधी / कार्यालयीन भाषा, मीडिया की भाषा

इकाई– 2 युवकों का समाज में स्थान : आचार्य नरेन्द्र देव / वित एवं वाणिज्य की भाषा, मशीनी भाषा

इकाई– 3 मातृभूमिः वासुदेवशरण अग्रवाल / संज्ञा सर्वनाम, विशेषण, क्रिया विशेषण

इकाई– 4 डॉ. खूबचंद बघेल : हरि ठाकुर/समास, संधि,

इकाई– 5 सम्भाषण–कुशलता : पं. माधवराव सप्रे, / अनुवाद – अंग्रेजी से हिन्दी में अनुवाद, संक्षिप्तियॉ

मूल्यांकन योजना –

प्रत्येक इकाई से एक–एक प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक इकाई को दो–दो खण्डों (क्रमश' 'क' और 'ख' में) विभक्त करते हुए निर्धारित पाठ से 8 एवं शेष पाठ्य सामग्री से 7 अंक के प्रश्न होंगे। इस प्रकार पूरे प्रश्न–पत्र के पूर्णांक 75 होंगे।

पाठ्यक्रम संशोधन का औचित्य : विद्यार्थी चर्चित एवं सुप्रसिद्ध व्यक्तियों के लेख के माध्यम से समाज एवं राष्ट्रहित के साथ–साथ व्यक्तित्व विकास विषयक मुद्दों से परिचित हो सके तथा व्याकरिणक एवं भाषा विषयक प्रस्तावित पाठ्यक्रम के माध्यम से हिन्दी भाषा संबंधित प्रयोग पक्ष से परिचित होते हुए प्रतियोगी परीक्षाओं की दृष्टि से ज्ञानार्जन कर सके।

ENGLISH LANGUAGE (Paper Code-1132)

B.A. / B.Sc. /B.COM. /B.H. Sc. - II

M.M.75

The question paper for B.A. /B.Sc./B.Com./B.H.Sc., English Language and cultural valuers shall comprise the following units:

UNIT-I Short answer questions to be passed by (Five short answer questions of three marks each) 15 Marks

UNIT-II (a) Reading comprehension of an unseen passage 05 Marks

(b) Vocabulary

UNIT-III Report-Writing 10 Marks

UNIT-IV Expansion of an idea 10 Marks

UNIT-V Grammar and Vocabulary based on the prescribed text book. 20+15Marks

Note: Question on all the units shall asked from the prescribed text which will Comprise Specimens of popular creative/writing and the following it any

a Matter & technology

i. State of matter and its structure

ii. Technology (Electronics Communication, Space Science)

b Our Scientists & Institutions

I. Life & work of our eminent scientist Arya Bhatt. Kaurd Charak Shusruta, Nagarjuna, J.C. Bose and C.V. Raman, S. Rmanujam, Homi J. Babha Birbal Sahani.

II. Indian Scientific Institutions (Ancient & Modern)

Books Prescribed:

Foundation English for U.G. Second Year - Published by M.P. Hindi Granth Academy, Bhopal.

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

NEW CURRICULUM OF B.Sc. PART II

SESSION 2019-20

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I

INORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz*., atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. OXIDATION AND REDUCTION: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

24.6.2019 24.6.19

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from uranium, similarities between the latter actinides and the latter lanthanides

UNIT-V

A. ACIDS BASES : Arrhenius, Bronsted-Lowry, conjugate acids and bases, relative strengths of acids and bases, the Lux-flood, Solvent system and Lewis concepts of acids and bases.

B. NON-AQUEOUS SOLVENTS

.Physical properties of a solvent, types of solvents and their general characteristics, reaction in non-aqueous solvents with reference to liquid ammonia and liquid sulphur dioxide, HF, H_2SO_4 , Ionic liquids.

REFERENCE BOOKS

1. Basic Inorganic Chemistry, F. A. Cotton, G. Wilkinson and P. L. Gaus, Wiley
2. Concise Inorganic Chemistry, J. D. Lee, ELBS
3. Concepts of Models of Inorganic Chemistry, B. Douglas, D. Mc Daniel and J. Alexander, John Wiley.
4. Inorganic Chemistry, D. E. Shriver, P. W. Atkins and C. H. Langford, Oxford.
5. Inorganic Chemistry, W. W. Porterfield, Addison – Wiley.
6. Inorganic Chemistry, A. G. Sharp, ELBS.
7. Inorganic Chemistry, G. L. Miessler and D. A. Tarr, Prentice Hall.
8. Advanced Inorganic Chemistry, Satya Prakash.
9. Advanced Inorganic Chemistry, Agarwal and Agarwal
10. Advanced Inorganic Chemistry, Puri, Sharma, S. Naginchand
11. Inorganic Chemistry, Madan, S. Chand
12. Aadhunik Akarbanic Rasayan, A. K. Shrivastav & P. C. Jain, Goel Pub
13. Uchchattar Akarbanic Rasayan, satya Prakash & G. D. Tuli, Shyamal Prakashan
14. Uchchattar Akarbanic Rasayan, Puri & Sharma
15. Selected topic in Inorganic Chemistry by Madan Malik & Tuli, S. Chand.

24.6.2019 24.6.19

Paper – II

ORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF ORGANIC HALIDES

Alkyl halides: Methods of preparation, nucleophilic substitution reactions – S_N1, S_N2 and S_N^i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution, elimination reactions.

Aryl halides: Preparation, including preparation from diazonium salts, Nucleophilic Aromatic Substitution; SNAr, Benzyne mechanism. Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.

UNIT-II

ALCOHOLS

A. Alcohols: Nomenclature, preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvaelt-Blanc Reduction for the preparation of alcohols, Dihydric alcohols – methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol-pinacolone rearrangement.

B. Trihydric alcohols - Nomenclature, methods of formation, chemical reactions of glycerol.

PHENOLS

A. Structure and bonding in phenols, physical properties and acidic character, Comparative acidic strength of alcohols and phenols, acylation and carboxylation.

B. Mechanism of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Hauben-Hoesh reaction, Lederer-Manasse reaction and Reimer-Tiemann reaction.

UNIT-III

ALDEHYDES AND KETONES

A. Nomenclature, structure and reactivity of carbonyl group. General methods of preparation of aldehydes and ketones.

Mechanism of nucleophilic addition to carbonyl groups: Benzoin, Aldol, Perkin and Knoevenagel condensation. Condensation with ammonia and its derivatives, Wittig reaction, Mannich reaction, Beckmann and Benzil- Benzilic rearrangement.

B. Use of acetate as protecting group, Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmensen reduction, Wolf-Kishner reaction, $LiAlH_4$ and $NaBH_4$ reduction. Halogenation of enolizable ketones, An introduction to α,β-unsaturated aldehydes and ketones.

24.6.2019 24.6.19

UNIT-IV

A. CARBOXYLIC ACIDS

Preparation, Structure and bonding, Physical and chemical properties including, acidity of carboxylic acids, effects of substituents on acid strength, Hell-Volhard Zeilinsky reaction. Reduction of carboxylic groups, Mechanism of decarboxylation.

Di carboxylic acids: Methods of formation and effect of heat and dehydrating agents, Hydroxyacids.

B. CARBOXYLIC ACID DERIVATIVES

Structure of acid chlorides, esters, amides and acid anhydrides, Relative stability of acyl derivatives.

Physical properties, inter-conversion of acid derivatives by nucleophilic acyl substitution.

Mechanism of acid and base catalyzed esterification and hydrolysis.

UNIT-V

ORGANIC COMPOUNDS OF NITROGEN

A. Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes. Mechanism of nucleophilic substitution in nitroarenes and their reduction in acidic, neutral and alkaline medium.

B. Reactivity, structure and nomenclature of amines, physical properties. Stereochemistry of amines. Separation of mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Preparation of alkyl and aryl amines (reduction of nitro compounds and nitriles), reductive amination of aldehydic and ketonic compounds. Gabriel-Phthalimide reaction, Hofmann-Bromamide reaction, Reactions of amines, electrophilic aromatic substitution of aryl amines, Reaction of amines with nitrous acid. Synthetic transformations of aryl diazonium salts, Azo coupling.

REFERENCE BOOKS

1. Organic Chemistry, Morrison and Boyd, Prentice-Hall.
2. Organic Chemistry, L. G. Wade Jr. Prentice Hall.
3. Fundamentals of Organic Chemistry, Solomons, John Wiley.
4. Organic Chemistry, Vol I, II, III S. M. Mukherjee, S. P. Singh and R. P. Kapoor, Wiley Easters (New Age).
5. Organic Chemistry, F. A. Carey, McGraw Hill.
6. Introduction to Organic Chemistry, Struiweisser, Heathcock and Kosover, Macmillan.
7. Organic Chemistry, P. L. Soni.
8. Organic Chemistry, Bahl and Bahl.
9. Organic Chemistry, Joginder Singh.
10. Carbanic Rasayan, Bahl and Bahl.
11. Carbanic Rasayan, R. N. Singh, S. M. I. Gupta, M. M. Bakidia & S. K. Wadhwa.
12. Carbanic Rasayan, Joginder Singh.

Paper – III
PHYSICAL CHEMISTRY **60 Hrs., Max Marks 34**

UNIT-I

A. THERMODYNAMICS-I

Intensive and extensive variables; state and path functions; isolated, closed and open systems; Zeroth law of thermodynamics. First law: Concept of heat, work, internal energy and statement of first law; enthalpy, Relation between heat capacities, calculations of q, w, U and H for reversible, irreversible and free expansion of gases under isothermal and adiabatic conditions. Joule-Thomson expansion, inversion temperature of gases, expansion of ideal gases under isothermal and adiabatic condition

B. THERMO CHEMISTRY

Thermochemistry, Laws of Thermochemistry, Heats of reactions, standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoff's equations) and pressure on enthalpy of reactions, Adiabatic flame temperature, explosion temperature.

UNIT-II

A. THERMODYNAMICS-II

Second Law of Thermodynamics: Spontaneous process, Second law, Statement of Carnot cycle and efficiency of heat engine, Carnot's theorem, thermodynamic state of temperature.

Concept of entropy: Entropy change in a reversible and irreversible process, entropy change in isothermal reversible expansion of an ideal gas, entropy change in isothermal mixing of ideal gases, physical signification of entropy, Molecular and statistical interpretation of entropy.

B. Gibbs and Helmholtz free energy, variation of G and A with pressure, volume, temperature, Gibbs-Helmholtz equation, Maxwell relations, Elementary idea of Third law of Thermodynamics, concept of residual entropy, calculation of absolute entropy of molecule.

UNIT III

A CHEMICAL EQUILIBRIUM

Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases. Concept of Fugacity, Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient. Coupling of exergonic and endergonic reactions. Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Thermodynamic derivation of relations between the various equilibrium constants Kp, Kc and Kx. Le Chatelier principle (quantitative treatment). Equilibrium between ideal gas and a pure condensed phase.

B IONIC EQUILIBRIA

Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono protic acids (exact treatment). Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.

UNIT-IV

PHASE EQUILIBRIUM

A. Phase rule, Phase, component and degree of freedom, derivation of Gibbs phase rule, Clausius-Claperon equation and its applications to Solid-Liquid, Liquid-Vapor and Solid-Vapor, limitation of phase rule, applications of phase rule to one component system: Water system and sulphur system.

Application of phase rule to two component system: Pb-Ag system, desilverization of lead, Zn-Mg system, Ferric chloride-water system, congruent and incongruent melting point and eutectic point.

Three component system: Solid solution liquid pairs.

B. Nernst distribution law, Henry's law, application, solvent extraction

UNIT V

PHOTOCHEMISTRY

Characteristics of electromagnetic radiation, Interaction of radiation with matter, difference between thermal and photochemical processes, Lambert-Beer's law and its limitations, physical significance of absorption coefficients. Laws of photochemistry: Grothus-Drapper law, Stark-Einstein law, quantum yield, actinometry, examples of low and high quantum yields, Photochemical equilibrium and the differential rate of photochemical reactions, Quenching, Role of photochemical reaction in biochemical process.

Jablonski diagram depicting various process occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), photosensitized reactions, energy transfer processes {simple examples), photostationary states, Chemiluminescence.

REFERENCE BOOKS

1. Physical Chemistry, G. M. Barrow, International student edition, McGraw Hill.
2. University General Chemistry, C. N. R. Rao, Macmillan.
3. Physical Chemistry, R. A. Alberty, Wiley Eastern.
4. The elements of physical chemistry, Wiley Eastern.
5. Physical Chemistry through problems, S. K. Dogra & S. Dogra, Wiley Eastern.
6. Physical Chemistry, B. D. Khosla,.
7. Physical Chemistry, Puri & Sharma.
8. Bhautik Rasayan, Puri, Sharma and Pathania, Vishal Publishing Company.
9. Bhautik Rasayan, P. L. Soni.
10. Bhautik Rasayan, Bahl and Tuli.
11. Physical Chemistry, R. L. Kapoor, Vol I-IV **.**
12. Chemical kinetics, K. J. Laidler, Pearson Educations, New Delhi (2004).

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

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PHYSICAL CHEMISTRY

Transition Temperature

- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:
  (i) $I_2(aq) + I \rightarrow I_3(aq)^{2+}$
  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt.

6 marks

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations.

12 marks

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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Session 2019-20

PHYSICS

B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

Transition to quantum statistics: 'h' as a natural constant and its implications, cases of particle in a one-dimensional box and one-dimensional harmonic oscillator.

Unit-5 Indistinguishability of particles and its consequences, Bose-Einstein & Fermi-Dirac conditions, Concept of partition function, Derivation of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics, Limits of B-E and F-D statistics to M-B statistics. Application of B-E statistics to black body radiation, Application of F-D statistics to free electrons in a metal.

TEXT AND REFERENCE BOOKS:

1. B.B. Laud, "Introduction to Statistical Mechanics" (Mcmillan 1981)
2. F. Reif : "Statistical Physics" (Mcgraw-Hill, 1998).
3. K, Haung : "Statatistical Physics" (Wiley Eastern, 1988).
4. Thermal and statistical Physics: R.K. Singh, Y.M. Gupta and S. Sivraman.
5. Statistical Physics: Berkeley Physics Course, Vol. 5
6. Physics (Part-2): Editor, Prof. B.P. Chandra, M.P. Hindi Granth Academy.
7. Heat and Thermodynamics: K.W. Zeemansky.
8. Thermal Physics: B.K. Agarwal.
9. Heat and Thermodynamics: Brij Lal and N. Subramanyam.
10. Heat and Thermodynamics: Dayal, Verma and Pandey.
11. A Treatise on Heat: M.N. Saha and B.N. Srivastava.

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Session 2019-20

PHYSICS

Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications, its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

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Session 2019-20

PHYSICS

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.Sc. Part-II
Paper-I
ADVANCED CALCULUS

UNIT-I Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion. Series of non-negative terms. Comparison tests, Cauchy's integral test, Ratio tests, Raabe's, Logarithmic, De Morgan and Bertrand's tests. Alternating series, Leibnitz's theorem. Absolute and conditional convergence.

UNIT-II Continuity, Sequential continuity, Properties of continuous functions, Uniform continuity, Chain rule of differentiability, Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives, Taylor's theorem with various forms of remainders.

UNIT-III Limit and continuity of functions of two variables. Partial differentiation. Change of variables. Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables. Jacobians.

UNIT-IV Envelopes, evolutes. Maxima, minima and saddle points of functions of two variables. Lagrange's multiplier method.

UNIT-V Beta and Gamma functions, Double and triple integrals, Dirichlet's integrals, Change of order of integration in double integrals.

REFERENCES :

1. Gabriel Klaumber, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
3. R.R. Goldberg, Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970.
4. D. Soma Sundaram and B. Choudhary, A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
6. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
7. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Co., New York.
8. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd., Allahabad.
9. S.C. Malik, Mathematical Analysis, Wiley Eastern Ltd., New Delhi.
10. O.E. Stanaitis, An Introduction to Sequences, Series and Improper Integrals, Holden-Dey, Inc., San Francisco, California.
11. Earl D. Rainville, Infinite Series, The Macmillan Company, New York.
12. Chandrika Prasad, Text Book on Algebra and Theory of Equations, Pothishala Pvt. Ltd., Allahabad.
13. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
14. Shanti Narayan, A Course of Mathematical Analysis, S.Chand and Company, New Delhi.

B.Sc. Part-II
Paper-II
DIFFERENTIAL EQUATIONS

UNIT-I Series solutions of differential equations- Power series method, Bessel and Legendre functions and their properties-convergence, recurrence and generating relations, Orthogonality of functions, Sturm-Liouville problem, Orthogonality of eigen-functions, Reality of eigen values, Orthogonality of Bessel functions and Legendre polynomials.

UNIT-II Laplace Transformation- Linearity of the Laplace transformation, Existence theorem for Laplace transforms, Laplace transforms of derivatives and integrals, Shifting theorems. Differentiation and integration of transforms. Convolution theorem. Solution of integral equations and systems of differential equations using the Laplace transformation.

UNIT-III Partial differential equations of the first order. Lagrange's solution, Some special types of equations which can be solved easily by methods other than the general method, Charpit's general method of solution.

UNIT-IV Partial differential equations of second and higher orders, Classification of linear partial differential equations of second order, Homogeneous and non-homogeneous equations with constant coefficients, Partial differential equations reducible to equations with constant coefficients, Monge's methods.

UNIT-V Calculus of Variations- Variational problems with fixed boundaries- Euler's equation for functionals containing first order derivative and one independent variable, Extemals, Functionals dependent on higher order derivatives, Functionals dependent on more than one independent variable, Variational problems in parametric form, invariance of Euler's equation under coordinates transformation.

Variational Problems with Moving Boundaries- Functionals dependent on one and two functions, One sided variations.

Sufficient conditions for an Extremum- Jacobi and Legendre conditions, Second Variation. Variational principle of least action.

REFERENCES :

1. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999.
2. D.A. Murray, Introductory Course on Differential Equations, Orient Longman, (India), 1967.
3. A.R. Forsyth, A Treatise on Differential Equations, Macmillan and Co. Ltd., London.
4. Lan N. Sneddon, Elements of Partial Differential Equations, McGraw-Hill Book Company, 1988.
5. Francis B. Hilderbrand, Advanced Calculus for Applications, Prentice Hall of India Pvt. Ltd., New Delhi, 1977.
6. Jane Cronin, Differential equations, Marcel Dekkar, 1994.
7. Frank Ayres, Theory and Problems of Differential Equations, McGraw-Hill Book Company, 1972.
8. Richard Bronson, Theory and Problems of Differential Equations, McGraw-Hill, Inc., 1973.
9. A.S. Gupta, Calculus of variations with-Applications, Prentice-Hall of India, 1997.
10. R. Courant and D. Hilbert, Methods of Mathematical Physics, Vots. I & II, Wiley-Interscience, 1953.
11. I.M. Gelfand and S.V. Fomin, Calculus of Variations, Prentice-Hill, Englewood Cliffs (New Jersey), 1963.
12. A.M. Arthurs, Complementary Variational Principles, Clarendon Press, Oxford, 1970.
13. V. Kornkov, Variational Principles of Continuum Mechanics with Engineering Applications, Vol. I, Reidel Publ. : Dordrecht, Holland, 1985.
14. T. Oden and J.N. Reddy, Variational Methods in Theoretical Mechanics, Springer-Verlag, 1976.

B.Sc. Part-II
Paper-III
MECHANICS

STATICS

UNIT-I Analytical conditions of Equilibrium, Stable and unstable equilibrium. Virtual work, Catenary.

UNIT-II Forces in three dimensions, Poinsot's central axis, Null lines and planes.

DYNAMICS

UNIT-III Simple harmonic motion. Elastic strings. Velocities and accelerations along radial and transverse directions, Projectile, Central orbits.

UNIT-IV Kepler's laws of motion, velocities and acceleration in tangential and normal directions, motion on smooth and rough plane curves.

UNIT-V Motion in a resisting medium, motion of particles of varying mass, motion of a particle in three dimensions, acceleration in terms of different co-ordinate systems.

REFERENCES :

1. S.L. Loney, Statics, Macmillan and Company, London.
2. R.S. Verma, A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad.
3. S.L. Loney, An Elementary Treatise on the Dynamics of a particle and of rigid bodies, Cambridge University Press, 1956.

B.Sc.–II (BOTANY) PAPER-I

(PLANT TAXONOMY, ECONOMIC BOTANY, PLANT ANATOMY AND EMBRYOLOGY)

UNIT-I

Bentham and Hooker system of classification.Binomial Nomenclature, International Code of Nomenclature for Algae, Fungi, and plants (IUCN), Typification, numerical Taxonomy and chemotaxonomy. Preservation of Plant material and Herbarium techniques.Important botanical gardens and herbaria of India, Kew Botanical garden, England.

UNIT-II

Systematic position, distinguishing characters and economic importance of the following families, Ranunculaceae, Magnoliaceae, Brassicaeae, Rosaceae, Papaveraceae, Caryophyllaceae, Rutaceae, Cucurbitaceae, Apiaceae, Rubiaceae, Apocynaceae, Asclepiadaceae, Solanaceae, Malvaceae, Convolvulaceae, Orchidaceae, Acanthaceae, verbenaceae, Lamiaceae, Asteraceae, Fabaceae, Euphorbiaceae, Poaceae and Liliaceae.

UNIT-III

Economic Botany: Botanical name, family, part used and uses of the following economically important plants, fiber yielding plants; Cotton, jute, sun, hemp, coir.Timber yielding plants: Sal, Teak, Shisham and Pine.Medicinal plants: Kalmegh, Ashwangandha, Ghritkumari, Giloy, Brahmi, sarpgandha, ---of medicinal plants of C.G. Food plants: Pearl millet, Buck of wheat, Sorghum, Soyabean, gram, Ground nut, Sugarcane and Potato.Fruit plants: Pear, Peach, Litchi. Spices: Cinnamon, Turmeric, Ginger, Asafoetida and Cumin. Beverages : Tea, Coffee Rubber Cultivation of important flowers: Chrysanthemum, Dahelia, Biodiesel plants Jatropha, Pongamia Ethnobotany in context of Chhattisgarh.

UNIT-IV

Plant Anatomy: Root and shoot apical meristems theories of root and shoot apex organization, permanent tissues, anatomy of root, stem and leaf of dicot and monocot, secondary growth in root and stem, Anatomical anomalies in the primary structure of stems (Nyctanthes, Boerhaavia, Casuarina), Anamolous secondary growth in Dracaena, Bignonia, Laptadenia.

UNIT-V

Embryology: Flower as a reproductive organ, anther, microsporogenesis, types of ovules, megasporogenesis, development of male and female gametophyte, pollination, mechanisms, self incompatibility, fertilization, endosperm, embryo, polyembryonoy, apomixes and parthenocarpy.

Books Recommended:

13.6.19 13/6/19 13.6.19 13.6.19

Singh, Pandey,Jain. ***Diversity and Systematics of Seed Plants***, Rastogi Publications Merrut

Sharma OP, ***Plant Taxonomy,*** Tata Mc Graw Hill, New Delhi

Pandey BP, ***Taxonomy of Angiosperms,*** S. Chand Publishing, New Delhi

Pandey, BP, ***Plant Anatomy,*** S.Chand Publishing, New Delhi

Pandey, BP, ***Economic Botany,*** S.Chand Publishing, New Delhi

Bhojwani, SS and Bhatanagar SP, ***Embryology of Angiosperm***, Vikas Publication House, New Delhi

Singh, Pandey, Jain, ***Embryology of Angiosperms***, Rastogi Publication, Meerut

Sharma, V, Alum, A. ***Ethnobotany***, Rastogi Publications, Meerut

Tayal, MS ***Plant Anatomy***, Rastogi Publication, Meerut

(Dr. J.N. Verma) (Dr.Rekha Pimpalgaonkar) (Dr.Ranjana Shristava)

Proff. & Head Proff. & Head Proff. & Head

Govt. D.B. Girls PG College Govt. N PG Science College Govt. VYTPG Science College

Raipur, (C.G.) Raipur, (C.G.) Raipur, (C.G.)

(Mrs. Sanchal Moghe) (Mr. Shivakant Mishra) (Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

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B.Sc.-II (BOTANY) PAPER-II

(ECOLOGY AND PLANT PHYSIOLOGY)

UNIT-I

Introduction and scope of ecology, environmental and ecological factors, Soil formation and soil profile, Liebig's law of minimum, Shelford's law of tolerance, morphological and anatomical adapataions in hydrophytes, xerophytes and epiphytes.

UNIT-II

Population and community characteristics, Raunkiaer's life forms, population interactions (e.g. Symbiosis, Amensalism etc.), succession, ecotone and edge effect, ecological niches, ecotypes, ecads, keystone species

Concept of ecosystem, trophic levels, flow of energy in ecosystem, food chain and food web, concept of ecological pyramids

Biogeochemical cycles:carbon cycle, nitrogen cycle and phosphorus cycle

UNIT-III

Plant water relations: Diffusion, permeability, osmosis, imbibitions, plasmolysis, osmotic potential and water potential, Types of soil water, water holding capacity, wilting, Absorption of water, theories of Ascent of sap, Mineral nutrition and absorption, Deficiency symptoms, Transpiration, stomatal movement, significance of transpiration, Factors affecting transpiration, guttation.

UNIT-IV

Photosynthesis: Photosynthetic apparatus and pigments, light reaction mechanism of ATP synthesis. C3, C4 CAM pathway of carbon reduction, photorespiration, factors affecting photosynthesis.

Respiration: Aerobic and anaerobic respiration, Glycolysis, Kreb's cycle, factors affecting respiration, R.Q.

UNIT-V

Plant growth hormones: Auxin, Gibberellin, Cytokinin, Ethylene and Abscissic acid. Physiology of flowering, Florigen concept, Photoperiodism and Vernalization. Seed dormancy and germination, plant movement.

Books Recommended:

Koromondy, EJ. ***Concepts of Ecology,*** Prentice Hall, USA

13.6.19 13/6/19 13.6.19 13.6.19

Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

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(Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

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Hemchand Yadav Vishwavidyala, Durg (C.G.)
Zoology
B.Sc. Part – II (2019-20)
Paper – I
(Anatomy and Physiology)

Comparative Anatomy of various organ systems of vertebrates:

Unit: I

- Integument and its derivatives: structure of scales, hair and feathers
- Alimentary canal and digestive glands in vertebrates
- Respiratory organs : Gills and lung , air-sac in birds

Unit: II

- Endoskeleton: (a) Axial Skeleton- Skull and Vertebrae, (b) Appendicular Skeleton Limbs and girdles
- Circulatory System: Evolution of heart and aortic arches
- Urinogenital System: Kidney and excretory ducts

Unit: III

- Nervous System: General plan of brain and spinal cord
- Ear and Eye: structure and function
- Gonads and genital ducts

Unit: IV

- Digestion and absorption of dietary components
- Physiology of heart, cardiac cycle and ECG
- Blood Coagulation
- Respiration: mechanism and control of breathing

Unit: V

- Excretion: Physiology of excretion, osmoregulation
- Physiology of muscle contraction
- Physiology of nerve impulse, Synaptic transmission

14.6.19

14.06.19

14.6.19.

Zoology
B.Sc. Part – II (2019-20)

Paper-II

VERTEBRATE ENDOCRINOLOGY, REPRODUCTIVE BIOLOGY BEHAVIOUR, EVOLUTION AND APPLIED ZOOLOGY

Unit: I

- Structure and function of Endocrine glands
- Hormone receptor
- Biosynthesis and secretion of thyroid, adrenal, ovarian and testicular hormones
- Endocrine disorder of pituitary, thyroid, adrenal and pancreas

Unit:II

- Reproductive cycle in vertebrates
- Menstruation, lactation and pregnancy
- Mechanism of parturition
- Hormonal regulation of gametogenesis

Unit: III

- Evidences of organic evolution.
- Theories of organic evolution.
- Variation, Mutation, Isolation and Natural selection.
- Evolution of Horse

Unit:IV

- Introduction to Ethology: Branches and concept of ethology.
- Patterns of Behaviour, Taxes, Reflexes, Drives and Stereotyped behaviour.
- Reproductive behavioural patterns.
- Drugs and behavior, Hormones and behaviour

Unit:V

- Prawn Culture
- Sericulture
- Apiculture
- Pisciculture
- Poultry keeping
- Elements of Pest Control: Chemical & Biological Control

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Zoology
B.Sc. Part II (2019-20)
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

14.6.19 14.06.19 14.6.19.

MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY

History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS

Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM

Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION

Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING

Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Paper- II: Bioinstrumentation and Biostatistics

UNIT-1: MICROSCOPY AND CENTRIFUGATION

Simple and compound light microscope, Bright field, Dark field, Phase contrast and Electron microscope. Centrifugation- principle and types of centrifuges (analytical and preparatory), types of centrifugation- differential and rate zonal centrifugation.

UNIT-2: pH metry and chromatography

Principle of pH meter, types of electrodes, factors affecting pH measurements, and application of pH meter. Chromatography- principle, types- paper, TLC and column chromatography, HPLC.

UNIT-3: SPECTROPHOTOMETRY

Electromagnetic spectrum, Beers-Lamberts law, Types (Principles, working and application)- colorimeter, UV - Vis Spectrophotometry and IR- Spectrophotometry, Turbidometry.

UNIT-4: Electrophoresis and X-Ray Diffraction

Principle of electrophoresis, instrumentation and Application, types of Paper, Gel electrophoresis and Immunoelectrophoresis. X-ray diffraction- principle and application.

UNIT-5: Biostatistics

Data- Types, characteristics, presentation and distribution. Data analysis- central tendency (Mean, Median and Mode), Deviation (variance SD and SE). Concept of probability.

Text Books Recommended:

1. Introduction to Istrumental analysis by Robert Braun.
2. Instrumental Techniques by Upadhyay and Upadhyay.
3. Instrumental Methods of Chemical Analysis by BK Sharma.
4. Bio statistics; Sunder Rao
5. Statistical Methods; S. P. Gupta; Sultan Chand & Sons

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PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

15/6/19 18/6/19 15/6/19 15/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Scheme of Examination

कक्षा	प्रश्नपत्र	विषय समूह	सैद्धा. अंक	प्रायो. अंक	योग
BSc. I year	I	भूगतिकी एवं भू–आकृति विज्ञान (Geodynamics & Geomorphology)	50	50	150
	II	खनिज एवं क्रिस्टल विज्ञान (Mineralogy & Crystallography)	50		
BSc. II year	I	शैलिकी (Petrology)	50	50	150
	II	संरचनात्मक भूविज्ञान (Structural Geology)	50		
BSc. III year	I	जीवाश्म विज्ञान एवं संस्तर विज्ञान (Palaeontology & Stratigraphy)	50	50	150
	II	भूसंसाधन एवं व्यावहारिक भूविज्ञान (Earth Resources & Applied Geology)	50		

-: Note :-

प्रत्येक वर्ष के विद्यार्थियों हेतु पाठ्यक्रम में उल्लेखित भूवैज्ञानिक क्षेत्रीय अध्ययन अनिवार्य होगा।

27-5-19 27/5/19

कक्षा / Class- B.Sc-II

Paper –I

शैलिकी

(PETROLOGY)

इकाई–01

(i) मैग्मा; परिभाषा, उत्पत्ति एवं संगठन

(ii) बॉवेन की अभिक्रिया श्रेणी, मैग्मीय विभेदन एवं स्वांगीकरण

(iii) तंत्र, प्रावस्था एवं घटक, उष्मागतिकी के सिद्धांत, एकघटकीय (सिलिका) द्विघटकीय ऐल्बाईट–एनॉर्थाइट तथा डायोप्साइड–एनॉर्थाइट एवं त्रिघटकीय सिलिकेट सिस्टम डायोप्साइड–एल्बाइट–एनॉर्थाइट क्रिस्टलीकरण, प्रावस्था संतुलन

(iv) आग्नेय शैलों का गठन, संरचनायें एवं वर्गीकरण

(v) आग्नेय शैलों का रूप

इकाई–02

(i) दिक्काल में शैल–संलग्नता, शैल–ग्रंथियों की अवधारणा

(ii) अम्लीय आग्नेय शैलों का शिला विवरणात्मक अध्ययन

(iii) क्षारीय आग्नेय शैलों का शिला–विवरणात्मक अध्ययन

(iv) अल्पसिलिक आग्नेय शैलों का शिलाविवरणात्मक अध्ययन

(v) अत्यल्पसिलिक आग्नेय शैलों का शिलाविवरणात्मक अध्ययन

इकाई–03

(i) अवसाद की उत्पत्ति, परिवहन एवं निक्षेपण

(ii) अवसाद निक्षेपण की वायूढ़, जलोढ़, तटीय, एवं गंभीर समुद्री वातावरण की गतिकी

(iii) अवसादी संलक्षणाओं की अवधारणा

(iv) डायजिनेसिस की अवधारणा

(v) अवसादी शैलों का गठन एवं संरचनायें

इकाई–04

(i) अवसादी शैलों का वर्गीकरण

(ii) अवसादी शैलों की शैलिकी : रूडेशियस, एरेनेशियस, केल्केरियस अवसादी शैल

(iii) कायान्तरणः परिभाषा एवं कारक, संलक्षणा, कायान्तरण श्रेणी

(iv) कायान्तरित शैलों का गठन, संरचना एवं वर्गीकरण

(v) कायान्तरण प्रक्रियाओं की साम्य एवं असाम्य अभिक्रियायें

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इकाई–05 (i) पैराजिनेटिक–आरेखः प्रक्षेपीय विश्लेषण, ए.सी.एफ. एवं ए.के.एफ. आरेख

(ii) मृण्मय अवसादों का प्रगामी कायान्तरण

(iii) अशुद्ध चूना पत्थरों का प्रगामी–उष्मागतिक कायान्तरण

(iv) अल्प सिलिक शैलों का प्रगामी उष्मागतिक कायान्तरण

(v) भारत का शैलिकीय–प्रादेशिक विभाजन

प्रायोगिक कार्य–

(1) आग्नेय, अवसादी एवं कायान्तरित शैलों के विभिन्न रूपों एवं संरचनाओं को रेखाचित्र की सहायता से प्रदर्शित करना।

(2) विभिन्न आग्नेय शैलों का स्थूलदर्शी अध्ययन एवं सूक्ष्मदर्शी अध्ययन

(3) विभिन्न अवसादी शैलों का स्थूलदर्शी एवं सूक्ष्मदर्शी अध्ययन

(4) विभिन्न कायान्तरित शैलों का स्थूलदर्शी एवं सूक्ष्मदर्शी अध्ययन

(5) भारत के शैलिकीय प्रदेशों का मानचित्र में प्रदर्शन

(6) नार्म कैलकुलेशन

Suggested Readings:-

(1) शैलिकी के सिद्धान्त – डॉ. अंबिका प्रसाद अग्रवाल

(2) शैलिकी के सिद्धान्त – ए. जी. झिंगरन

(3) Principles of petrology - G.W. Tyrell

(4) Petrology - H.William, F.J. Turner & E.M. Gilbert

(5) Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee

(6) A text book of sedimentary petrology - Verma & Prasad

(7) Metamorphism & Metamorphic rocks of India- S. Ray

(8) Sedimentary rocks - F.J. Pettijohn

(9) Introduction of sedimentology - S.Sengupta

(10) Sedimentary Environment - H.G. Readings

27-5-19 27/5/19

Class- B. Sc. -II

Paper –I

(PETROLOGY)

Unit:1	(i)	Magma, definition, origin & composition
	(ii)	Bowen's reaction series, magmatic differentiation & assimilation
	(iii)	System, phases & component, principles of thermodynamics, Crystallisation and phase equilibrium of unicomponent magma:(Silica), Bi-component magma: Albite-Anorthite and Diposide-Anorthite Tri-component magma: Diopside-Albite-Anorthite
	(iv)	Textures, structures & classification of igneous rocks
	(v)	Forms of igneous rocks
Unit:2	(i)	Rock association in Time & Space, concepts of rock kindreds
	(ii)	Petrographic studies of Acid igneous rocks.
	(iii)	Petrographic studies of Alkaline igneous rocks
	(iv)	Petrographic studies of Basic igneous rock
	(v)	Petrographic studies of Ultrabasic igneous rocks.
Unit:3	(i)	Origin, transportation & deposition of sediments
	(ii)	Dynamics of sedimentary depositional environment; Aeolian, fluvial, coastal and abyssal environment.
	(iii)	Concept of sedimentary facies
	(iv)	Concept of diagenesis
	(v)	Textures & structures of sedimentary rocks.
Unit:4	(i)	Classification of sedimentary rocks.
	(ii)	Petrography of sedimentary rock; rudaceous, arenaceous, calcareous sedimentary rocks.
	(iii)	Metamorphism; definition, agents, facies & grade
	(iv)	Textures, structures & classification of metamorphic rocks.
	(v)	Equilibrium & non-equilibrium reactions in metamorphism.
Unit:5	(i)	Paragenetic diagrams; projective analysis A.C.F & A.K.F. diagrams
	(ii)	Progressive metamorphism of Argillaceous rocks.
	(iii)	Progressive dynamo-thermal metamorphism of impure limestone.
	(iv)	Progressive dynamo-thermal metamorphism of basic igneous rocks.
	(v)	Petrographic provinces of India.

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Practical:

(1) Diagrammatic representation of various forms & structures of igneous, sedimentary & Metamorphic rocks

(2) Megascopic studies of various sedimentary, metamorphic & igneous rocks.

(3) Microscopic studies of various sedimentary, metamorphic & igneous rocks.

(4) Norm calculation

(5) Diagrammatic representation of petrographic provinces of India in outline map of India.

Suggested Readings:-

(1) शैलिकी के सिद्धान्त – डॉ. अंबिका प्रसाद अग्रवाल

(2) शैलिकी के सिद्धान्त – ए. जी. झिंगरन

(3) Principles of petrology - G.W. Tyrell

(4) Petrology - H.William, F.J. Turner & E.M. Gilbert

(5) Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee

(6) A text book of sedimentary petrology - Verma & Prasad

(7) Metamorphism & Metamorphic rocks of India- S.Ray

(8) Sedimentary rocks - F.J. Pettijohn

(9) Introduction of sedimentology - S.Sengupta

(10) Sedimentary environment - H.G. Readings

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कक्षा / Class- B.Sc-II

Paper –II

संरचनात्मक भू–विज्ञान

(STRUCTURAL GEOLOGY)

इकाई–01	(1)	संरचनात्मक भूविज्ञान की परिभाषा एवं अध्ययन क्षेत्र।
	(2)	शैल दृष्यांशों का अध्ययन। दृष्यांशों पर नति तथा ढाल के प्रभाव।
	(3)	संस्तरण की पहचान। नति एवं नतिलम्ब की माप।
	(4)	क्लाइनोमीटर एवं ब्रन्टन कम्पास।
	(5)	संस्तरों के शीर्ष तथा तल की पहचान।
	(6)	शैलविरूपण की अवधारणा। प्रतिबल तथा विकृति दीर्घवृत्तज की अवधारणा।
इकाई–02	(1)	वलन की आकारिकी।
	(2)	वलन की ज्यामितिक एवं जननिक वर्गीकरण।
	(3)	स्थलीय तथा भूवैज्ञानिक मानचित्र में वलन की पहचान।
	(4)	दृश्यांशों पर वलन के प्रभाव।
	(5)	वलन क्रियाविधि की प्राथमिक अवधारणा।
इकाई–03	(1)	भ्रंश आकारिकी। सर्पण और सेपरेशन।
	(2)	भ्रंश का ज्यामितिक एवं जननिक वर्गीकरण।
	(3)	स्थलक्षेत्र तथा भूवैज्ञानिक मानचित्र में भ्रंश की पहचान।
	(4)	दृश्यांशों पर भ्रंश के प्रभाव।
	(5)	भ्रंशन क्रियाविधि की प्राथमिक अवधारणा।
इकाई–04	(1)	संधि; आकारिकी, संधि का ज्यामितिक एवं जननिक वर्गीकरण।
	(2)	पत्रण की परिभाषिक शब्दावली, प्रकार, उत्पत्ति एवं विशाल संरचनाओं से संबंध।
	(3)	रेखण की परिभाषिक शब्दावली, प्रकार, उत्पत्ति एवं विशाल संरचनाओं से संबंध।
	(4)	लवण गुम्बद,
	(5)	प्लूटान; विवर्तनिकी एवं अभिस्थापन
इकाई–05	(1)	विषमविन्यास के प्रकार एवं पहचान।
	(2)	पुरान्तशायी एवं नवान्तशायी, अतिव्यापन तथा अपव्यापन।
	(3)	विवर्तनिकी की अवधारणा।
	(4)	प्रायद्वीपीय, सिंधु गंगा के मैदान तथा प्रायद्वीपेत्तर भारत का विवर्तनिकी विन्यास।
	(5)	त्रिविमीय प्रक्षेपण का संरचनात्मक भूविज्ञान में अनुप्रयोग।

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प्रायोगिक कार्य–

(1) प्राकृतिक संरचनात्मक प्रादर्शों का अध्ययन।

(2) विभिन्न संरचनाओं का प्रादर्शों के माध्यम से अध्ययन।

(3) मानचित्र में दृश्यांश को पूरा करना।

(4) सरल से जटिल संरचनाओं को प्रदर्शित करने वाले मानचित्रों से भूवैज्ञानिक काट बनाना एवं भूवैज्ञानिक इतिहास की विवेचना करना।

(5) संरचनात्मक भूविज्ञान में स्टिरियोग्राफिक प्रोजेक्शन का अनुप्रयोग।

(6) सात दिवसीय भूवैज्ञानिक क्षेत्रीय अध्ययन।

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Class- B.Sc - II
Paper –II
(STRUCTURAL GEOLOGY)

Unit:1
(i) Definition and scope of Structural Geology. Study of outcrops. Effects of dip and slope on outcrops.
(ii) Identification of bedding. Dip and strike measurement.
(iii) Clinometer and Brunton compass.
(iv) Recognition of top and bottom of beds.
(v) Concept of rock deformation. Concept of stress and strain ellipsoids.

Unit:2
(i) Fold morphology.
(ii) Geometric and genetic classification of folds.
(iii) Recognition of folds in the field and on geological maps.
(iv) Effect of folds on outcrops.
(v) Elementary idea of mechanics of folding.

Unit:3
(i) Fault morphology. Slip and separation.
(ii) Geometric and genetic classification of faults.
(iii) Recognition of faults in the field and on geological maps.
(iv) Effect of faults on outcrops.
(vi) Elementary idea of mechanics of faulting.

Unit:4
(i) Joint morphology; geometric and genetic classification of joints.
(ii) Foliation; terminology, kinds, origin and relation to major structures.
(iii) Lineation: terminology, kinds, origin and relation to major structures.
(iv) Salt domes.
(vii) Plutons; tectonics & emplacement.

Unit:5
(i) Types and recognition of Unconformity.
(ii) Outlier and inlier. Overlap & offlap.
(iii) Concept of tectonics.
(iv) Tectonic framework of Peninsula, Indo-Gangetic Plains and Extra-Peninsular India.
(v) Stereographic projection & it use in Structural Geology.

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Practical-

(1) Study of Natural Structures in hand specimens.

(2) Study of structures with the help of models.

(3) Completion of outcrops.

(4) Preparation of geological section from simple to complex geological maps and its interpretation.

(5) Application of stereographic projection in structural geology.

(6) Geological excursion for seven days.

Books recommended:

(1) संरचनात्मक भूविज्ञान – डॉ.डी.के. श्रीवास्तव

(2) भूवैज्ञानिक संरचनाएँ – डॉ. भरत सिंह राठौर

(3) प्रायोगिक भूविज्ञान (भाग–2) – आर.पी. मांजरेकर

(4) Structural Geology : M.P. Billings.

(5) Theory of Structural Geology : Gokhale, N.W.

(6) Exercises on Geological maps and dip-Strike: Gokhale, N.W.

(7) Outlines of structural Geology: E.S. Hills.

(8) Structural Geology : Hobbs, Means and Williams.

(9) Geological maps : Chiplonkar and Pawar.

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B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	First
Name of the Paper	:-	ARCHAEOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Archaeological Anthropology, branches of Archaeology: Classical Archaeology, Historical Archaeology, Prehistoric Archaeology and Protohistoric Archaeology. Anthropology as Archaeology. Differences between the Old world and new world Archaeological Traditions. Absolute and Relative Dating.

UNIT – II Geological time scale. The Great Ice Age
Stratigraphy and other evidences of Ice Age: River terraces. Moraines etc. Pluvial and interpluvials
Stone Age tools: Types and Technology.

UNIT – III Age of Paleolithic savagery:
European lower Paleolithic period: Stone tools and cultures
Indian lower Paleolithic period: Sohan Culture & Madrasian Culture.
European Middle Paleolithic Period: Tools & culture; Flake took complex in India
European Upper Paleolithic period; Tools and Culture, main characteristics of the European Paleolithic Home and Cave art and its significance.

UNIT – IV Mesolithic complex in North Europe. Mesolithic complex in Western Europe, Mesolithic Culture in India. Chief feature of Neolithic revolution. Neolithic complex in India.

UNIT – V Metal Age: Copper, Bronze and Iron Age
Urban revolution: General Features
Indus valley civilization: Main Features, Town Planning, Economic activities, origin and decay

20/06/19

B.A. /B.Sc. – Second Year
Session: 2019-20

Name of the Subject :- Anthropology
Paper : - Second
Name of the Paper :- TRIBAL CULTURE OF INDIA
Total Marks : 50 Pass Marks : 17

Syllabus

UNIT-I

Define tribe and scheduled tribe. Geographical distribution of Indian tribes and their racial and linguistic classification. Contribution of Anthropology in the study of Indian tribes.

Sacred complex, Universalisation and parochialisation, Sanskritisation, westernization, dominant caste.

Tribes and caste, Difference between S.C. and S.T.

Particularly Vulnerable Trible Group (PVTG) of Chhattisgarh (Kamar, Birhor, Hill Korwa. Abujhmariya, Baiga)

UNIT-II

Primitive economy:-

Stages of tribal economy: Hunting, food gathering, fishing, shifting and settled agriculture.

Concept of Property and ownership in tribal societies

Problems of tribal people: land alienation, bonded labour, indebtedness, shifting cultivation, irrigation, Unemployment, agricultural labour; Forest and Tribals

New economic anthropology: Exchange- Gifts, barter, trade, ceremonial exchange and market economy

UNIT-III

The problems of culture contact: Problems due to urbanization and industrialization, Regionalism

Tribal religion: origin & function, animism, totemism.

Concept and practices of Magic and witchcraft, shamanism, head hunting.

UNIT-IV

Political organisation of Indian tribes: Distinction between state and stateless society, law in primitive society

Social organization of Indian Tribes: Matriarchal and patriarchal family,. Lineage and clan, Ways of acquiring mates in tribal societies.

Youth dormitories: Type, organisation and functions.

UNIT-V

Tribal development: History of tribal development, the constitutional safeguards for the scheduled tribes.

Tribal problem: isolation, migration, acculturation, detribalization.

Policies, plans and programmes of tribal development and their implementation. Tribal revolts in India.

Contributions of anthropology to tribal development.

Response of the tribal people for development programs of government and NGO

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Recommended Readings:

1. Chaudhary, Bhudadeb (Ed.). Tribal Development in India.
2. Elwin,V.A. Philosophy for NEFA.
3. Haimendorf. The Tribes of India: Struggle for survival.
4. Shara B.D. Basic Issues in tribal Development.

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B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - Practical

Name of the Paper :- MATERIAL CULTURE AND RESEARCH TOOLS

Total Marks : 50 Pass Marks : 17

OBJECTIVES :

The objective of this practical course is to introduce the student with the primitive material culture and technology used by primitive man and the student will be introduced with various techniques commonly used by social Anthropology.

MATERIAL CULTURE :

Part – I. Identification and technological descriptions of the following.

1. Implements for food gathering, hunting, fishing and agriculture
2. Fire making implements
3. Types of habitations
4. Land and water transport

Part-II Sketching, identification and the description of Paleolithic, Mesolithic and Neolithic tools

(It is essential that students should draw at least five tools of each age)

Part- III Construction of schedule, Geneology and Questionnaire

Each student should collect information through above tools from 10 Respondents.

The Student will be required to maintain practical records of all work done in the practical class.

20/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A./B.Sc. –II
Subject: Statistics
Paper-I(Paper Code-0853)
Statistical Methods

Unit I

Sampling from a distribution: Definition of a random sample, simulating random sample from standard distributions (uniform, Normal, Exponential), concept of derived distributions of a functions of random variables, concept of a statistics and its sampling distribution. Point estimate of a parameter. Properties of a good estimator, Concept of bias and standard error of an estimate .Standard errors of sample mean, sample proportion. **S**ampling distribution of sum of Binomial, Poisson and mean of Normal distributions. Independence of sample mean and variance in random sampling from a Normal distribution (without derivation).

Unit II

Statistical tests and interval estimation: Null and alternative hypothesis. Types of errors, level of significance, p values, one and two tailed tests, Procedure for testing of hypothesis. Statement of chi-squares, Student's t and F statistics. Testing for the single mean and variance of a univariate normal distribution, testing the equality of two means and testing for the equality of two variances of two univariate normal distributions. Related confidence intervals. Testing for the significance of sample correlation in sampling from bi-variate normal distribution and for equality of means and equality of variances in sampling from bivariate normal populations.

Unit III

Large sample tests: use of central limit theorem for testing and interval estimation of a single mean and a single proportion and difference of two means and two proportions, Fisher's Z transformation and its uses. Pearson's chi-square test for goodness of fit and for homogeneity for standard distributions. Contingency table and test of independence in a contingency table.

Unit IV

Nonparametric tests: Definition of order statistics and their distributions, Non-parametric tests, Sign test for univariate and bivarite distributions, Wilcoxon test, Mann-Whitney test, Run test, median test and Spearman's rank correlation test.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Frund J.E. (2001) Mathematical Statistics, Prentice Hall of India.
2. Goon A.M., Gupta M.K., Das Gupta.B. (1991): Fundamentals of Statistics, Vol.I, World Press, Culcutta.
3. Gupta and Kapoor: Fundamentals of Mathematical Statistics S.Chand & Sons.
4. Hodges, J.L. and Lehman E.L. (1964): Basic Concepts of Probability and Statistics, Holden Day.
5. Mood A.M, Graybill F.A and Boes D.C. (1974): Introduction to the Theory of Statistics, McGraw Hill.

ADDITIONAL REFERENCES

1..Bhat B.R., Shrivenkatramana T and Rao Madhava K.S. (1997): A Beginner's Text, Vol. II, New age International (P) Ltd.

2. Rohatgi, V.K. (1967): An Introduction to Probability Theory and Mathematical Statistics, John Wiley & Sons.

3. Snedecor, G.W. and Cochran W.G. (1967): Statistical Methods. Lowa State University Press.

Paper-II (Paper Code-0854)
Sampling Theory and Design of Experiments

Unit I
Concepts of population and sample, need for sampling ,Census and sample survey , Basic concepts in sampling , organizational aspects of survey sampling, sample selection and sample size .
Some basic sampling methods – simple random sampling (SRS) with and without replacement.

Unit II
Stratified random sampling , Systematic sampling , Allocation problems, ratio and regression methods of estimation under SRS.
Non-sampling errors, aquitance of working (questionnaires, sampling design, methods followed in field investigation, principal findings, etc) of NSSO and other agencies undertaking sample surveys.

Unit III
Analysis of variance for one way and two-way classifications. Need for design of experiments, fundamental principal of design, basic designs- CRD, RBD, LSD and their analysis.

Unit IV
Missing plot technique. Analysis of co-variance. Factorial experiments : 2^2, 2^3 factorial experiments, illustrations, main effects and interactions, confounding and illustrations. Yates method of finding treatment totals.

Unit V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Cocran W.G. (1977): Sampling Techniques, John Wiley and Sons.
2.Des Raj (2000): Sample Survey Theory, Narosa Publishing House.
3.Murthy M.N(1967): Sampling Theory and Methods, Statistical Publishing Society, Calcutta.
4.Singh, D. and Chaudhary,F.S. (1986): Theory and analysis of Sample Survey Designs. New Age International Publisher.
5.Sukhatme P.V., Sukhatme B.V., Sukhatme S. and Ashok C.(1984), : Sample Survey Methods and Its Applications, Indian Society of Agricultural Statistics, New Delhi.
6. Das M.N. and Giri (1986) : Design and analysis of experiments,springer verlag.
7.Goon A.M.,Gupta M.K.,Das Gupta B. (1986): Fundamentals of Statistics, Vol.II, World Press, Culcutta.
8. Joshi,D.D.(1987):Linear Estimation and Design of Experiments,Wiley Eastern.
9. Kempthorne O.(1965) : The Design and Analysis of Experiments,Wiley Eastern.

Paper III:

Practical : Practicals Based on Paper I & II

1. drawing random samples from standard univariate discrete and continuous distributions such as Binomial, Poission, Normal, Cauichy and Exponential.
2. Tests of significance based on Student's t, Chi-square, F. Test of significance of sample correlation coefficient. Use of Z Transformation.Testing of equality of means and equality of variance in sampling from bivariate normal.
3. Large sample tests for means and proportions, tests of goodness of fit and independence of attributes in contingency tables.
4. Nonparametric tests: Sign, Run, Median, Wilcoxon, Mann-Whitney tests.
5. Selection of samples and determination of sample size. Simple random sampling, Statified and systematic sampling. Allocation problem in stratified sampling. Ratio and regression methods of estimation.
6. Analysis of variance for one way and two way classifications. Analysis of CRD, RBD and LSD. Analysis of 2^2 and 2^3 experiments.

DEFENCE - STUDIES

PAPER - I

WESTERN MILITARY HISTORY

(Paper Code - 0867)

Note : The aim of this paper is to give a historical, political & social back ground of the state engaged in the conflicts under study and the factors influencing the development of different forms of warfare and weapons system.

Note : Question will be set from each unit there will be only Internal choice.

UNIT-I
1. Sunt Zu - Founderof MilitaryTheory and philosophy.
2. Clausewitz - War and its relationship with politics.
3. Macheavelli - Renaissance of Art of war.
4. Jomini- Concept of mass armies.

UNIT-II
1. Churchil.
2. MahatmaGandhi.
3. Kautilya.
4. A.Hitler.

UNIT-III
1. Mao TseTung.
2. CheGuevara.
3. Economic and Psychologicalwar.
4. CollectiveSecurity.

UNIT-IV
1. Indo-China War -1962 Causes of war, political&military lesson.
2. Indo - PakWar -1965 Causes of war, political &military lesson.
3. Indo - PakWar - 1971 Causes of war, political &military lesson.
4. Kargil Conflict1999.

UNIT-V
1. Internal & External threats of NationalSecurity.
2. Insurgency andCounter-Insurgency.
3. Terrorism-Problem andSolution.
4. Naxalism - Problem and solution.

REFRENCE BOOKS:

1. HowardM. : Theory and Practice of war
2. ---,,--- : Clausewitz
3. Mao TseTung : Guerilla warfare
4. Palit,D.k. : The lightning War Tadit Yudh
5. Mankekar : War of1971
6. आर.सी. जोहरी : पाश्चात्य सैम्य विचारक
7. शर्मा च निगम : सैम्य विचारक।

PRACTICAL

There shall be a practical examination of 3.5 hours duration carrying 50 Marks. The division of marks shall be as follow:

(a)	Exercise based onMap-reading:		15marks
(b)	T.W.E.S.T.	:	15marks
(c)	Sessionalwork	:	10marks
(d)	Viva-Voce	:	10markss

PART - A

Map-reading:

1. Scales - Definition, method of expressing, construction of simple, time, diagonalandcomparative.
2. Relief and itsrepresentation.
3. Slopes andGradient.
4. Visibility and inter-visibility by Gradient, proportionate and section method.
5. Re-section andinter-section.
6. Grid system-Map reference, Indexto map. Four figure and Sixfigure.

PART - B

7. Organizationand equipment of infantry Platoon and Section.
8. SectionFormation.
9. Indication of Target by various methods.
10. Fire controlorder.
11. Patrols.
12. Battle Procedures(ROFT).
13. VerbalOrder.
14. Message-Writing.

BOOKS RECOMMENDED:

1.Manual of MapReading: Landon Her
2. युद्ध स्थल कला : चौ. नरेन्द्र सिंह
3.एन.सी.सी. परिचय : विष्णु कांत शर्मा।

INDUSTRIAL CHEMISTRY

PAPER – I

(Paper Code - 0871)

M.M. 34

UNIT-I Material Science : Mechanical Properties of materials and change with respect to temperature. **02L**

Material of constructions used in Industry :

Metals and Alloys : Important metals & alloys; iron, copper, aluminium lead, nikel, titanium and their alloys- Mechanical and chemical properties and their applications. **06L**

Cement : Types of cement, composition, manufacturing process, setting of cement. **04L**

Ceramics : Introduction, Types, Manufacturing process, Applications. Refractories. **04L**

UNIT-II Polymeric Mateials : Industrial polymer and comoposite materials- Their constitution, Chemical and physical properties, Industrial applications. **06L**

UNIT-III Glass : Types, composition, manufacture, physical and chemical properties, Applications. **04L**

Corrosion : Various types of corrosion relevant to chemical Industry-Machanism, Preventive methods. **04L**

UNIT-IV Pollution : Air, Oxygen, nitrogen cycle, water, Biosphere, flora and fauna, Energy, soil. **05L**

Pollutants and their statutory limits, pollution evaluation methods. **04L**

UNIT-V Air pollution-various pollutants. water pollution-organic/inorganic pollutants, Noise pollution, sewage analysis, pesticide pollution, Radiation pollution, green house effect, future. **10L**

Books Recommended :

1. Pollution control in chemical & Allied Industries, S.P. Mahajan.
2. Poolution Control in Industries, A Sories of Books by Jones, H.P.
3. Air Pollution - Vol.1 to 4, Editor, STERN, A.C.; Academic Press.
4. Environmental Engineering, G.N. Pandey, Tata McGraw Hill.
5. Homd Book of Air Pollution, A. Parker, Tata McGraw Hill.
6. Science of Ceromic chemical Processing, Hench, L.L.
7. Science of Ceramics, Stewarts, G.H.
8. Chemistry of Cement.
9. Properties of Glass, Morcy, G.W.
10. Chemistry of Glasses, Paul, A.
11. Corrosion, causes & Prevention, Spellur, F.N.

PAPER - II
(Paper Code - 0872)

M.M. 33

UNIT-I Unit processes in organic chemicals manufacture -

Nitration : Introduction - Nitrating agents, Kinetics and mechanism of nitration processes such as nitration of :

i Paraffinic hydrocarbons
ii. Benzene to nitrobenzene and m-dinitrobenzene
iii. Chlorobenzene to o and p nitrochloro benzenes.
iv. Acetanilide to p-nitroacentanilide
v. Toluene

Continous vs batch nitration. **12L**

UNIT-II Helogenation: Introduction-Kintics of helogenation reactions reagents for elogenation, Helogenation of aromatics-side chain and nuclear helogenations, commercial manufacture of chlorobenzenes, chloral, monochloracetic acid and chloromethanes, dichloro fluormethane. **09L**

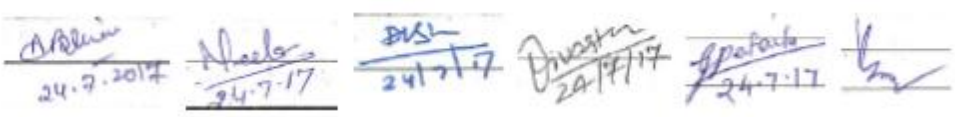
UNIT-III Sulphonation : Introduction-sulphonating agents, chemical and physical factors in sulphonation, Kinetics and mechanism of sulphonation reaction, commercial sulfonation of benzene, naphthalene, alkyl benzene, Batch vs continous sultphonation. **09L**

UNIT-IV Effluent Treatment and waste Management : Principles and equipments for aerobic, anaerobic treatment, adsorption, filtration, sedimentation. **09L**

UNIT-V Bag fillters, electrostatic precipitator, mist eliminators, wet scrubbers, absorbers, solid waste management, industrial safety. **09L**

Books Recommended :

1. Unit process in Organic synthesis P.M. Groggins, McGraw Hill.
2. Effluent Treatment in process Industries - Inst. of Cham. Engg.
3. Effluent Treatment and waste Disposal - Inst. of Chem. Engg.
4. Effluent Treatment and Disposal - Inst. of Chem. Engg.



PAPER - III
(Paper Code - 0873)

M.M. 33

UNIT-I Oxidation : Introduction-Types of oxidation reactions, oxidizing agents, kinetics and mechanism of oxidation of organic compounds liquid phase oxidation, vapor phase oxidation, commercial manufacture of benzoic acid, maleic anhydride, phthalic anhydride, acrolein, acetaldehyde, acetic acid. **07L**

UNIT-II Hydrogenation : Introduction-Kenetics and thermo-dynamics of hydrogenation reactions, catalysts for hydrogenation reactions, hydrogenation of vegetable oil. manufacture of methanol from carbon monoxide and hydrogen, hydrogenation of acids and esters to alcohols, catalytic reforming. **07L**

Alkylation: Introducton; Types of alkylation, Alkylating agents, Thermodynamics and mechanism of alkylation reactions, manufacture of - alkyl benzenes (for detergent manufacture), ethyl benzene, phenyl ethyl alcohol, N-alkyl anilines (mono and di- methyl anilines) **03L**

UNIT-III Esterification : Introduction; Hydrodynamics and kinetics of esterification reactions, Esterification by organic acids, by addition of unsaturated compounds, esterification of carboxy acid derivaives, commercial manufacture of ethyl acetate, dioctyl phthalate, vinyl acetate, cellulose acetate. **04L**

Amination : (A) By reduction : Intoduction, Methods of reduction-metal and acid, catalytic, sulfide, electrolytic, metal and alkali sulfites, metal hydrides, sodium metal, concentrated caustic oxidation, reduction, commercial manufacture of aniline, m-nitroaniline, p-amino phenol.

(B) By aminolysis : Introduction, aminating agents, factors affecting. **09L**

Hydrolysis : Introduction; hydrolysing agents, kinetics, thermodyanics and mechanism of hydrolysis. **02L**

UNIT-IV Procees Instrumentation : concept of measurement and accuracy Principle, construction and working of following measuring instruments.

Temperature : Glass thermometers, bimetallic thermometer pressure spring thermometer, vapour filled thermometers resistance thermometers. radiation pyrometers.

Pressure : Manometers, barometers, bourdon pressure gauge ; bellow type, diaphragm type pressure gauges, macleod gauges, pirani gauges, etc. **12L**

UNIT-V Liquid level : Direct-indirect liquid level measurement, Float type liquid level gauge, ultrasonic level gauges; bubbler system, density mesurement, viscocity measure- ment. **07L**

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

Books Recommended :

1. Unit process in organic synthesis, P.M. Groggins, McGraw Hill.
2. Industrial Instrumentation, Bekmen, D.P., John wrleys.
3. Applied Instrumentation in process Industries, Vol. I, II & III, Andrews, W.G., Gulf Publication.
4. Instrumentation and Control for the process Industries, Borer, S. Elsevier Applied Science Publishers.
5. Chemical Enggineer's Hand book, Perry, J.H. and Green, D. McGraw Hill.

Time : 4 Hours **PRACTICALS** **M.M. 50**

Unit Process : One to two examples of each of the following unit processes. Nitration, sulphonation, friedel-crafts reaction, esterification, hydrolysis, oxidation, Halogenation, chloro-sulfhonation, reduction, polymerization, reactions of diazonium salts. **Instrumental methods of analysis :** Use of colourimeter pH meter, potentiometer, conductometer, refractometer, polarimeter

Materialtesting: Testing of alloys identification of plastics/rubber estimation of yield point, young's modulus, flaredness; Optical, thermal mechanical and electrical properties. **Process Instrumentation :** Transducers of different types. use of Tranducer for measuring flow control. Determinatiaon of flash point and ignition points of liquids.

Water analysis : Solid contents, Hardness, COD and other tests as per industrial specifications.

Flow measuring devices : Floats Monographs of reprsentative raw materials such as sulphuric acid, toluene, sodium, carbonate, sodium hyroxide, carbon tetrachloride benzoic acid (5-6 compounds). Limit tests for heavy metals Pb, AS, Hg, Fe and ash content.

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VOCATIONAL COURSE IN ELECTRONIC EQUIPMENT MAINTENANCE

SCHEME OF EXAMINANTION

		Max. Marks	Min. Pass Marks
Paper - I	Operational Principles of Audio	50	17
Paper - II	Microprocessor Based Instrumentation and Control	50	17
	Practicals	50	17

1. SUBJECT OBJECTIVE :

The objective of this syllabus is to femiliarize students with the fundamentals of electronics and prepares him/her to keep in track with fast change in this field so that he/she is prepared to takenup advance studies or go for self employment. It is proposed to give the students an idea of basics of all the developments in the field of electronics. Efforts are directed to impart some knowledge of computer hardware and software too, which fall in the realu of electronics so that the students become aware of fast changing scene of information superhigh wey also.

2. JOB POTENTIALS :

The students in (by) taking up this course may find adequta job- opportunities in industries or manufacturing firms. They may opt for setting up their own small scale industries of electronics, thus enhancing self employment.

3. **Contents :** As per attached syallbus.
4. Subject scheme.
5. On the job training will be imparted in Summer days.
6. As detailed out in the prospectus.
7. As per the draft given in the syllabus.
8. Permissible combination of subject Physics, Mathemetics & Electonic equipment mathematics.

PAPER - I

(Paper Code - 0859)

OPERATIONAL PRINCIPLES OF AUDIO AND VIDEO EQUIPMENTS

M.M. 50

UNIT-I Revision of All and FH, communication bands, signal sources, Basic Principles of propagation of e.m. wave through atmosphere and ionosphere; ground waves, sky waves, space waves, dead zones etc.

RECEIVING ANTENNAE: Antenna Parameters like gain, radiation pattern, effective aperture. Ferrite AE. Type of antennae like wire, loop, dish, Yagi, telescopic, their construction and operating principles.

SUPERHETERODYNE RECEIVERS: Principles, advantages, block diagram, RF input and AE co upling arrangments, RF amplifiers, mixer, local oscillator, IF amp. Detector, audio amplifier, loud speaker, power requirements, tuning/aligning of receivers, waveforms and voltages at different check points. Circuit reading of various radio sets, repair and trouole shooting, automobile radios.

UNIT-II ELEMENTS OF A TELEVISION SYSTEM : Picture transmission, sound transmis-sion, picture reception, sound reception, synchronisation.

TYPE VIDEO SIGNAL : Scanning sequence details, sync details of the 625 line system, channel bandwidth, vestigial sideband transmission, reception of vestigial sidepand signals, frequency modulation, FH channel band-width, channel bandwidth for colour transmission, allocation of frequancy bands for television bandwidth for colour transmission, allocation or frequancy bands for television signel transmission, television standards.

Picture tubes- monochrome and colour : Beam deflection, face plate, picture tube charecteristics, picture tube circuit controls.

UNIT-III TELEVISION RECEIVERS : Types of television receivers, receiver sections, video detector, video section fundamantals, video emplifiers-design principles, video amplifier circuits, autometic gain control and noise cancelling circuits, syno seperation circuits, syno-processing and AFC circuits, deflection circuits, sound system, RF tuner, video IF amplifiers, receiver power supplies, television receiver antennae, colour television antennae.

TELEVISION APLICATIONS : Television broadcasting, cable television, closed circuit television, theatre television, picture phone and facsimile, video tape recording (VTr, television via satellite, TV games, HDTV, flatoanel TV teleconferancing.

UNIT-IV TAPE RECORDERS : Principles of magnanic recording, characteristies of magnetism, the hysterists loop, recording head, recorded wave-length, response of head during reply, the effect of gap length, low frequency loss, other losses, equalization, the effect of non-linear characeristic of magnification recording bias, A.C. bias, erasin the tape, block diagram of audio tape recorder.

Oscillator, preamplifier, dolby, amplifier, record (play back) head, erase head, tapes (metal polymer), mechanical transport system, stereo recording, double deck, single deck, microphones (RF, Cable), noise, maintenance of mechanial parts, head cleaners, head alignment, graphic equalisers.

UNIT-V TELEPHONES : Modulation, demodulation, modem, subscribar frequency allotment, channel organisation, signalling, svitching, manual exchanges, STD, ISD, EFABX, Intercom-stress on equipment and EPABX, Value added services like FAX E mail.

MEASURING INSTRUMENTS : Multimeters analog/digital, oscilloscopes, signal generators, noise and sound level meters, frequency counters, error sources and precautions during measurement.

GENERAL NOTE : Familiarisation with catalogues, standard specification, knowledge about companies referring to service manual.

PAPER - II

MICROPROCESSOR BASED INSTRUMENTATION AND CONTROL

(Paper Code - 0860)

M.M. 50

UNIT-I MICROCOMPUTER FUNDAMENTALS : Introduction, simplified microcomputer architecture, simplified memory organization, instruction set, simplified CPU organisation, microcomputer operation, Personal computer organization and Word Processor. Data sheet descriptions, pin diagram and function, microprocessor architecture, using the data/address register, using the stack pointer.

UNIT-II THE INTEL 8080/8085 MICROPROCESSOR : Introduction, the 8085 pin diagram and functions, the 8085 architecture, addressing modes, the 8080/8085 instructions set, the 8080/8085 date transfer instructions, the 8080/8085 arithmatic instructions, the 8080/8085 logical instructions, the 8080/8085 stack, I/O, and machine control instructions.

UNIT-III PROGRAMMING THE MICROPROCESSOR : Machine and assembly languages, simplified instruction set, instruction set, arithmetic operations, instruction set-logical operations, instruction set-date transfar operations, instruction set branch operations, instruction set-subroutne all and return operations, instruction set-miscellaneous operations, writing a program, addressing modes, program branching, program looping using subroutines.

Programming the 8080/8085 microprocessor : Introduction, straight-line programs, looping programs, mathematical programs.

UNIT-IV INTERFACING THE MICROFROCESSOR : Introduction, interfacing with ROM, interfacing with RAM, input/output interfacing basics, interfacing with practical I/O ports, synohronizing I/O data transfers using interrupts. address decoding.

UNIT-V Application to illustrate the use of microprocessor in :

(i) Traffic control

(i) Tempereture control

(i) Digital clock

(iv) Stepper motor control

(v) Washing machine control

PRACTICALS

A student is required to do atleast 12 experiments in an academic year, and one month Summer Training. The scheme of practical examination will be as follows :

(i) One experiment of 3 hours duration and one Month Summer Training.

(i) Marks

Experiment	:	25 Marks
Sessional	:	10 Marks
One Month Summer Training	:	15 Marks
Total		**50 Marks**

* The marks for summer training will be awarded by the thachers teadhing the students on the basis of the certificate issued by the external supervisor of the summer training.

LIST OF PRACTICALS

1. Development of soldering skill by constructing a fewcircuits and testing.
2. PCB making.
3. Study of modulator.
4. Study of oscillator.
5. Tape recorder-testing, assembly and dis-assembly.
6. Radio receiver-testing.
7. Study of PA system and i.s. testing.
8. Study of EPABK, wiring and connectivity with telephone instruments.
9. Familiarisation with 8085 Based microprocessor trainer kit. Location of 8085, 8279, 8253 keyboard, display fields, EPROM Programmer, expansion s lot, TTY and serial lines.
10. Entering and executing an assembly language program, codes for insertion, deletion, memory move, block fill, setting and examining ragisters and memory, single step execution of a program.
11. Writing of a prgram to add. subtract and multiply two numbers stored in memory (nnnn & nnnn * 1) and place the result in the subsequent memory, (nnn * 2).
12. Writing of a program to test R.H. for errors by writing O's & 1's in altornaco location and reading it for chaecking.
13. Making of a board with a 3LED's and four switches to connect to the 8085 kit on the expansion slot (8279).
14. Making of a board with a 8 LED's and four switches to connect to the 8-85 kit on the expansion slot (8255).
    (a) Program the 8255 to glow/switch of LED's.
    (b) Program the 8255 to switch on and OFF the LED's every few second according to a given pattern (Hint : The pattern can be 01010101 and 10101010 or 001001100, or any other).

Reference Books:

1. Fundamentals of acoustics : Kinsler & Frey
2. System trouble shooting Handbook : Luces K, Faulken Berry (John Wiley & Sons)
3. Monochrom & Colour Television : P.R. Gulati
4. Television Engineering : Dhake
5. Microprocessor : Gaonkar
6. Microprocessor : B. Ram
7. Microprocessor : Shaum Saries

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B.SC.-II
COMPUTER SCIENCE
PAPER - I
COMPUTER HARDWARE
(PAPER CODE - 0855)

DURATION 3 HOURS **MAX.MARKS 50**

AIM - The emphasis in on the design concepts &organisational details of the common PC,learning the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1. To introduce the overall organisation of the microcomputers.
2. To introduce the common peripheral devices used in computers.
3. To introduce the hardware components, use of micro processor and function ofvarious chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study isrestricted to only the description and understanding part, fence the paper setter isrequested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers;Memory addressing capability of CPU; word length and processing speed of computes.Microprocessors single chip microcomputers; large and small computers. Usersinterface Hardware software and firmware. multi programming multi user system.Dumb smart and intelligent terminals computer network and multi processing, LANparallel processing. Flinn's classification of computers. Computer flow and data flowcomputers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instructionword size, Various addressing mode interrupts and exceptions, some special Controlsignals and I/O devices. Instruction cycle fetch and execute operation, time Diagram,data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtualMemory Semiconductor memory. Memory controller and magnetic memory; RAM;disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive.readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other output devices, I/O port serial data transfer scheme, Micro controller, signal processor,I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming,Program Design, software development, flow & chart multi programming, multiuser,multi tasking Protection, operating system and utility program, application package.

RECOMMENDED BOOKS :

1. Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy EasternLtd.)
2. Computers Today - By Donal H. Sanders
3. Computers Fundamental - By Rajaraman.
4. IBM PC - XT Clones - By GovindaRajalu

B.Sc.-II
PAPER - II
SOFTWARE
(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving through the concept ofobject oriented programming.

OBJECT OF THE COURSE -

1. To introduce the internet & web related technology & learn the intricacies of web-pagedesigning using HTML.
2. To introduce the object oriented programming concept using C++ language.
3. To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I HTML BASICS & WEB SITE DESIGN PRINCIPLES

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, NamingScheme for HTML Documents , HTML document/file, HTML Editor , Explanationof the Structure of the homepage , Elements in HTML Documents ,HTML Tags, BasicHTML Tags, Comment tag in HTML, Viewing the Source of a web page, How todownload the web page source? XHTML, CSS, Extensible Markup Language (XML),Extensible Style sheet language (XSL), Some tips for designing web pages, HTMLDocument Structure. HTML Document Structure-Head Section, Illustration ofDocument Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META,<TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML DocumentStructure-Body Section:-Body elements and its attributes: Background; BackgroundColor; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin,Organization of Elements in the BODY of the document: Text Block Elements; TextEmphasis Elements; Special Elements — Hypertext Anchors; Character-LevelElements; Character References ,Text Block Elements: HR (Horizontal Line); Hn(Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, SpecialElements — Hypertext Anchors ,Character-Level Elements: line breaks (BR) andImages (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLEElement, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & PhysicalStyles, Netscape, Microsoft and Advanced Standard Elements List, FONT,BASEFONT and CENTER.

UNIT-II IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT andCENTER Insertion of images using the element IMG (Attributes: SRC (Source),WIDTH, HEIGHT, ALT (Alternative), ALIGN),IMG (In-line Images) Element andAttributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal andExternal Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Linksto a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAMEAnchors ,TITLE attribute, Practical IT Application Designing web pages links witheach other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of objectoriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, PassingArgument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments infunction.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object asfunction argument ,copy constructor ,struct and classes , array as class member,Static Class Data, Static Member Functions, , Friend function, Friend class, operatoroverloading. Type of inheritance, Base class, Derive class. Access Specifier:protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointerand array, pointer and function, pointer and string, memory management, new anddelete, pointer to object, this pointer Virtual Function: Virtual Function, Virtualmember function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, charI/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1. Introduction to HTML	:	KamleshAgarwala, O.P.Vyas, Prateek A. Agrawala (KitabMahal Publication)
2. Let us C++	:	Y. Kanetkar B.P.B Publication
3. Programming in C++	:	E. Balaguruswami
4. Mastering in C++	:	VenuGopal
5. Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

Session 2019-20

June 2019 onwards

Class: B.Sc. Electronics

Scheme of Examination

Paper Code	Course Opted	Title of Course	Theory	Practical	Grand Total	Minimum Passing Marks
First Year						
ELB-101	Core Course	Network Analysis And Analog Electronics	**50**		**100**	**33**
ELB-102	Core Course	Linear and Digital Integrated Circuits	**50**			
ELB-103P	Core Course Practical/Tutorial	Networks Analysis and Analog Electronics Lab	**25**	**50**	**50**	**17**
ELB-104P	Core Course Practical/Tutorial	Linear and Digital Integrated Circuits Lab	**25**			
Second Year						
ELB-201	Core Course	Communication Electronics	**50**		**100**	**33**
ELB-202	Core Course	Microprocessor and Microcontrollers	**50**			
ELB-203P	Course Practical/Tutorial	Communication Electronics Lab	**25**	**50**	**50**	**17**
ELB-204P	Course Practical/Tutorial	Microprocessor& Microcontroller Lab	**25**			
Third Year						
EL301	**Skill Enhancement Course**	Industrial Electronics	**50**		**100**	**33**
EL302	**Skill Enhancement Course**	Mobile Application Programming and Introduction to VHDL	**50**			
EL303P	**Skill Enhancement CoursePractical**	Industrial Electronics Lab	**25**	**50**	**50**	**17**
EL304P	**Skill Enhancement Course Practical**	Mobile Application Programming and Introduction to VHDL Lab	**25**			

B. Sc. Part II

ELECTRONICS

Paper I

ELB 201: COMMUNICATION ELECTRONICS

Theory: **Max. Marks :50**

Unit-1

Electronic communication: Introduction to communication – means and modes. Needfor modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

Unit-2

Analog Modulation: Amplitude Modulation, modulation index and frequency spectrum.Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver

Analog Pulse Modulation: Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

Unit-3

Digital Pulse Modulation: Need for digital transmission, Pulse Code Modulation,Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK).

Optical Communication: Introduction of Optical Fiber, Block Diagram of optical communication system.

Unit-4

Introduction to Communication and Navigation systems:

Satellite Communication– Introduction, need, Geosynchronous satellite orbits,geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

Unit-5

Mobile Telephony System – Basic concept of mobile communication, frequency bandsused in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitativeonly).GPS navigation system (qualitative idea only)

Reference Books:

1. Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
2. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
4. Electronic Communication systems, G. Kennedy, 3rdEdn., 1999, Tata McGraw Hill.
5. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
6. Communication Systems, S. Haykin, 2006, Wiley India
7. Electronic Communication system, Blake, Cengage, 5th edition.
8. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

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Paper II

ELB 202 :MICROPROCESSOR ANDMICROCONTROLLER

Theory: **Max. Marks :50**

Unit-1

Microcomputer Organization: Input/Output Devices. Data storage (idea of RAM andROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.
8085 Microprocessor Architecture: Main features of 8085. Block diagram. Pin-outdiagram of 8085. Data and address buses. Registers. ALU. Stack memory. Program counter.

Unit-2

8085 Programming : Instruction classification, Instructions set (Data transfer includingstacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts.

Unit-3

8051 microcontroller: Introduction and block diagram of 8051 microcontroller,architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.

Unit 4

8051 I/O port programming: Introduction of I/O port programming, pin out diagram of8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation.
8051 Programming: 8051 addressing modes and accessing memory locations usingvarious addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions,

Unit 5

8051 programming in C: for time delay & I/O operations and manipulation, for arithmetic and logic operations, for ASCII and BCD conversions.
Introduction to embedded system: Embedded systems and general purpose computersystems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press
5. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
6. Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India
7. Introduction to embedded system, K.V. Shibu, 1st edition, 2009, McGraw Hill
8. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	**--**	**30**
Viva	**--**	**10**
Sessional	**--**	**10**
Total	**--**	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures

Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning.

B.Sc.-II
INFORMATION TECHNOLOGY
PAPER - I
DIGITAL CIRCUITS & COMPUTERH/W
(Paper Code - 0874)

UNIT-I(A) Number Systems :
Octal and hexadecimal number, decimal rep., complements, addition, subtraction, multiplication, division, fixed point rep, floating point rep., other binary code- gray code, excess 3 gray, 2421, etc. error detection code.

(B) Boolean Algebra :
Laws, demorgan'stheorem, Simplification boolean expression & logic diagram, positive & negative logic, K-map and simplification of K-map.

UNIT-II Combinational circuits :
Half adder, full adder, flip-flop : SR, JK, D,T, sequential circuits : encoder, decoder, multiplexer, shift register, binary counters, BCD adder.

UNIT-III Multivibratorcircuits :
Monostable, astable, bistable, smitt trigger, clocked RS, master-slave flip-flop, edge triggered flip-flop, latch.
Intergratedcircuits :
RTL, DITL, TTL, CMOS, MOS.

UNIT-IV (A) Central Processing Unit :
Introduction, register organisation, stack organisation, Instruction formats, Addressing modes.

(B) I/O Organisation :
I/O interfaces, Data transfer, types and modes, interrupts, DMA, IOP.

UNIT-V Memory Organisation :
Memory hierarcy, main memory, Auxiliary memory, Associative memory, cache memory, virtual memory, memory management techniques.

REFERENCE TAXT BOOK :

1.	Integrated Electronics	-	Millman&Halkias
2.	Principle of Electronics	-	V.K. Mehta
3.	Digital Electronics	-	R.P. Jain
4.	Computer System Architecture	-	Morris Mano
5.	Digital Electronics & Computer Hardware	-	Morris Mano

B.Sc.-II
PAPER - II
(Paper Code - 0875)

UNIT-I Introduction to OPP : Advantages of OPP, the Object oriented approach, characteristics of object oriented languages : object, classes, inheritance, reusability, polymorphism and C++.

UNIT-II Function **:** function declaration, calling function, function definition, passing arguments to function, passing constant, passing value, fegerence argument, returning by reference, inline function, function overloading, default arguments in function.

UNIT-III Object and Classes, using the Classes Constructor, class destructor, object as function argument, copy constructor, struct and classes, array as class member, static class data, static member functions, friend function, friend class, operator overloading, type of inheritance, base class derive class, access speceifier, protected, member function.

UNIT-IV Pointers : & and * operator pointer variables, pointer to pointer, void pointer, pointer and array, pointer and functions, pointer and string, memory management, new and delete, pointer to object, this pointer, virtual function : virtual function, virtual member function, accesses with pointer, pure virtual function.

UNIT-V File and stream : C++ steams, C++ manipulators, Stream class, string I/O, char I/O, object I/O, I/O with multiple objects, disk I/O.

REFERENCE TEXT BOOKS:

1.	Programming in C++	-	E. Balaguruswami
2.	Mastering in C++	-	VenuGopal
3.	Object Oriented Programming in C++	-	Robert Lafore
4.	Let us C++	-	Y. Kanetkar

PRACTICAL WORK

1. The sufficient Practical work should be done for understanding the paper 2.
2. At least five programs on each unit from unit 2 to unit 5 be prepared.
3. All practical works should be prepared in form of print outs and be valuated while practical examination.

INDUSTRIAL MICROBIOLOGY

Paper	Title	Time	Marks
First	Environmental Microbiology and Biostatistics	3 hrs.	50
Second	Microbial Physiology and Immunobiotechnology	3 hrs.	50
	PRACTICAL Examination	4 hrs.	50
	(including sessionals)		(40+10)

Note : During Two months Summer Vacation, students will visit some Industries. He/She will submit "Summer Job-Training Report" in B.Sc. IIrd Year Viva Voce Exam.

PAPER - I

ENVIRONMENTAL MICROBIOLOGY AND BIOSTATISTICS

(Paper Code - 0876)

M.M.50

UNIT-1 Our environment : Soil, water and air. Concept of environment in relation to microbes. Environment included physiological adaptations in microorganisms. Nature of microbial population in soil, water and air. Biogeochemical cycling - Carbon, Nitrogen, Sulphur and Phosphorus.

UNIT-2 Population interactions : Neutralism, Commensalism, Synergism, Mutualism, Antago-nistic relationships. Mycorrhizal associations. VAM and its importance.

UNIT-3 Nitrogen fixation by symbiotic and non-symbiotic microorganisms. Use of microorgan-isms as biofertilizers. Mass cultivation of Rhizobium and Azotobacter. Use of blue-green algae as biofertilizers.

UNIT-4 Liquid waste disposal. Nature of domestic and municipal waste and sewage. Sewage treatment. Solid waste disposal. Methods of disposal of Agricultural waste.

UNIT-5 Basic idea of probability, normal, binomial and poisson distribution. Mean, Mode and Median. Chi-Square test. Exponential and Logarithemic Functions.

PRACTICALS

1. Isolation of Microorganisms from Air.
2. Isolation of Microorganisms from Water.
3. Isolation of Microorganisms from soil.
4. Determination of MPN of faecal contaminants in water.
5. Measurment & confirmation of E. coli in water sample.
6. Biochemical tests for identification of enteric bacteria.
7. Study of Rhizobium from root nodules.
8. Study of symbiotic and non-symbiotic blue-green algae.
9. Problems based on the determination of Mean, Madian and Mode.
10. Problems on Chi-Square Test.
11. Experiments to demonstrate Symbiotic, Antagonistic acticvities and relations amongst microbes and their interactions with plants.

29/7/12 29/7/12

RECOMMENDED BOOKS :

1. Introduction to Soil Microbiology by Martin Alexander.
2. General Microbiology by Pelczar, Reid & Chan.
3. Biofertilizers in Agriculture by N.S. Subba Rao.
4. Statistics by Mishra & Mishra.
5. General Microbiology, Vol. II, by Power & Daginawala.

PAPER - II

MICROBIAL PHYSIOLOGY AND IMMUNABIOTECHNOLOGY
(Paper Code - 0877)

M.M. 50

UNIT-1 Diffusion, gaseous exchange, Osmosis, Plasmolysis, Biochemical properties of membernes, Passive and Active trnaport mechanism. Role of ionophores, group translocation across the memberanes.

UNIT-2 Photosynthetic microbes, Osygenic and non-oxygenic reaction centre. Electron transport, Photophosphorylation, Calvin Cycle. Photorespiration and its significance. Effect of various factors on rate of photosynthesis.

UNIT-3 Respiration mechanisms - Breakdown of carbohydrates through glycolysis, Kreb's cycle. Fermentation. Pentose Phosphate Pathway. Fermentation of alcohol, Citric acid and acetic acid.

UNIT-4 Methanogens and Methylotrophs. Sulphur utilizing bacteria. Sulphate reduction pathway. Economic importance of Methylotrophs and sulphur utilizing bacteria.

UNIT-5 History and Scope of immunology, Types of immunity. Antigen-Antibody reactions. Immunoglobulins - Structure and functions.
Production of Vaccines and Monoclonal antibodies.

PRACTICAL

1. Isolation of photosynthetic bacteria and cyanobacteria from soil.
2. Isolation and characterisation of Methanogens.
3. Study of Hydrogen-production by bacteria.
4. Measurement of nitrate uptake by microorganisms.
5. Study of nitrate and nitrite reduction by microorganisms.
6. Demonstration of evolution during photosynthesis.
7. Demonstration of plasmolysis, osmosis, active and passive transport mechanism.
8. Testing of Blood Groups.
9. Titration of Antigen and Antibody.
10. Precipitation reaction of antigens and antibodies.

BOOK RECOMMENDED :

1. Cell Biology by Pawar.
2. General Microbiology, Vol. II, by Power and Daginawala.
3. Immunology by Davis.
4. Immunology by G.P. Ta

29/7/17 29/7/17

BIOCHEMISTRY

PAPER - I

E N Z Y M O L O G Y **M.M. 50**

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.
Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measure-men and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT- I ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of Kcal/ Km . Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.
Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.
Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

PAPER - II

INTERMEDIARY METABOLISM M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, becterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phospho-rylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria.

$\beta-$ oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. Biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.

PRACTICAL

1. Separation of Blood Plasm and Serum
   a. Estimation of proteins from serum by biuret and lowry methods.
   b. Determination of albumin and A/G ratio in serum.
2. Estimation of bilirubin (conjugated and unconjugated) in serum.
3. i Estimation of total lipids in serum by vanillin method.
   ii. Estimation of cholesterol in serum.
4. Estimation of lipoproteins in plasma.
5. Estimation of lactic acid in blood before and after exercise.
6. Estimation of blood urea nitrogen from plasma.
7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.
8. Separation of polar and non-polar lipids by thin-layer chromatography.
9. Estimation of SGPT and SGOT in serum.
10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.
11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.
12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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Syllabus of Biotechnology

(B. Sc. II Year)

Session

2019-2020
2020-2021

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
B.Sc. II
BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

10.6.19 10.6.19 10/6/19 10.6.19

List of Books

1. Gerald Karp - Cell and Molecular biology, 4th Edition (2005).
2. Lewis J.Klein Smith and Valerie M.Kish-Principles of cell and molecular biology-Third
3. Edition (2002)
4. P.K. Gupta- Cell and molecular biology, Second Edition (2003), Rastogi publications.
5. Richard M-Twyaman-Advanced Molecular Biology, First South Asian Edition (1998), VivaBooks Pvt. Ltd.
6. K. Wilson and J.Walker (2012) Principle and Techniques of Biotechnology and MolecularBiotechnology.
7. Upadhya and Upadhya : Biophysical Chemistry.
8. David, I. Nelson and Michael M.Cox :Lehniger : Principal of Biochemistry 4th Edition. W.H. Freeman and Company, New York.
9. Buchanan, Gruissemen& Jones (2015) Biochemistry & Molecular Biology of Plant, 2nd edition.

B.Sc. II
BIOTECHNOLOGY

PAPER II

RECOMBINANT DNA TECHNOLOGYAND GENOMICS

M.M. 50

UNIT-I

1. Recombinant DNA technology: General concept. Steps in gene cloning and application.
2. Host controlled Restriction Modification System, Ligases and Polymerases, Klenow fragment, Taq, Pfu polymerase and Nuclease (Endo, Exo and restriction endonuclease).
3. Modification Enzyme (Kinase, Phosphates and terminal deoxynucleotidyl transferase). Reverse Transcriptase.

UNIT –II

1. Vectors: Plasmid, Bacteriophages, Cosmid, SV40 and Expression vectors.
2. Gene Library: Genomic and cDNA library.
3. Selection and Screening of Recombinants: Genetic and Hybridization methods.

UNIT –III

1. PCR: Types of PCR, Steps (Denaturation, Annealing and Extension); Applications, Advantages and Limitation of PCR.
2. Molecular Marker-RFLP, RAPD and Micro array.
3. Human Genome Project.

UNIT-IV

1. Basic concept of Gene Transfer Methods: Microinjection, Electroporation, Lipofection and Microprojectile.
2. Gene Therapy: *In vivo* and *Ex vivo*, Germ line and Somatic gene therapy.
3. Basic idea of Stem cell technology: Types of stems cell cultures and their Significance.

UNIT-V

1. Introduction to Bioinformatics: History, Objective and Application.
2. Major Bioinformatics Resource – NCBI , Types of Databases (Primary and Secondary Databases) , BLAST and FASTA
3. Basic concept of Genomics and Proteomics

10.6.19 10.6.19 10/6/19 10.6.19

List of Books

1. B.D. Singh (2004) Biotechnology, Expanding Horizons. First Edition. Kalyani Publishers, Ludhiana.
2. P.K. Gupta (2005) Biotechnology and Genomics, Rastogi Publication, Meerut.
3. Stan bury and Whittaker - Principles of Sterilization techniques, First Indian reprint Edition (1997). Aditya Book (P) Ltd. New Delhi.
4. L.E. Casida (1994)Industrial Microbiology Edition .
5. A.H. Patel (2003) Industrial Microbiology 4th Edition.
6. K.S. Bilgrami and A.K. Pandey(1998) Introduction to Biotechnology Edition 2nd (1998)
7. U Satyanarayan (2005) Biotechnology, First Edition Books and Allied (P) Ltd. Kolkata.
8. Atul kumar and VandanaA.Kumar (2004) Plant Biotechnology and tissue culture, Principle and Perspectives, International Books Distributing Co. Lucknow.
10. S Choudhuri, and DB Carlson (2008) Genomics: Fundamentals and applications, 1st edition.
11. TK Attwood and DJ Parry (2009) Introduction of Bioinformatics.
12. Philip E Bourne Helge Whisking (2003) Structural Bioinformatics.
13. Des Higgins and Willie Taylor (2000) Bioinformatics Sequence, Structure and Databanks.

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 3861 /अका./2021 दुर्ग, दिनांक 30/7/21

प्रति,

प्राचार्य,

समस्त संबद्ध महाविद्यालय,

हेमचंद यादव विश्वविद्यालय,

दुर्ग (छ.ग.)

विषयः— स्नातक स्तर भाग–तीन के पाठ्यक्रम विषयक।

संदर्भः— संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05. 2019।

————00————

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–तीन के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2021–22 से लागू किये जाते हैंः—

1. बी.ए. — आधार पाठ्यक्रम – हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान
2. बी.एस–सी. — आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.ए./बी.एस.सी (गृह विज्ञान) — आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।
4. बी.सी.ए. — भाग–3
5. बी.कॉम. — भाग–1, भाग–2 एवं भाग–3 का परिवर्तित पाठ्यक्रम सत्र 2019–20 में जारी कर लागू किया जा चुका है।

कृ.प.उ.

उपरोक्त विषयों को शिक्षा सत्र 2021–22 से संशोधित रूप में स्नातक स्तर भाग–तीन के लिए लागू किया जाता है स्नातक स्तर भाग–एक हेतु सत्र 2019–20 एवं स्नातक स्तर भाग–दो हेतु सत्र 2020–21 में लागू पाठ्यक्रम मान्य होंगे।

टीपः– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

कुलसचिव

क्र. 3862 /अका./2021

दुर्ग, दिनांक 30/7/21

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 के परिपेक्ष्य में सूचनार्थ
2. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. वेबसाईट प्रभारी, वेबसाईट पर पाठ्यक्रम प्रकाशित करने हेतु।
4. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of

B.A. Final Year
Session 2021-22

(Approved by Board of Studies)
Effective from July 2021

REVISED ORDINANCE NO.11

(As per State U.G.C. Scheme)

BACHELOR OF ARTS

1. The three year course have been broken up in to three Parts.

   Part-I Examination : at the end of the first year.
   Part-II Examination : at the end of the second year and
   Part-III Examination : at the end of the third year.

2. A candidate who after passing (10-2) or intermediate examination of C.G. Board of Secondary Education, Raipur or any other examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated college or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.A. Part-I examination.

3. A candidate who after passing B.A. Part-I examination of the University or any other examination recognised by the University as equivalent thereto has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part II Examination.

4. A candidate who after passing B.A. Part II examination of the University has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.A. Part-III examination.

5. Besides regular students, subject to their compliance with this ordinance, ex-students and non-collegiate candidates shall be eligible for admission to the examination as per provisions of Ordinance N. 6 relating to Examinations (General). Provided that non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular students at any of the University Teaching Department or College.

6. Every candidate for the Bachelor of Arts examination shall be examined in : A. Foundation Course :

   i) Group B - Hindi Language
   ii) Group C - English Language

   B. Three Core subjects : One subject from any three groups out of the following six groups :

      1. Sociology/Ancient Indian History/An thropology.
      2. Political Science/Home Science/Vocational Course.

3. Hindi Literature/Sanskrit Literature/Urdu Literature/Math.
4. Economics/Music/Linguistics/Defence studies.
5. Philosophy/Psychology/Geography/Education/Management.
6. History/English Litrature/Statistics.
7. Practicals (if necessary) for each core subject.

7. Any candidate who has passed the B.A. examination of the University shall be allowed to present himself for examination in any of additional subjects prescribed for the B.A. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.A. Part I examination in the subject which he proposes to offer and then the B.A. Part II and Part III examination in the same subject. Successfull candidate will be given a certificate to that effect.

8. In order to pass at any part of the three year degree course examination, an examinee must obtain not less than 33% of the total makrs in each subject/group of subjects. In subject/group of subjects, where both theory and practical examination are provided, an examinee must pass in both theory and practical parts of the examination separately.

9. Candidate will have to pass separately at the Part-I, Part II and part-III examination. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the divison of the Final examination, total marks obtained by the examinees, in their Part-I, Part-II and Part-III examination in the aggregate shall be taken into account. Candidate will not be allowed to change subjects after passing Part I Examination.

   Provided in case of candidate who has passed the examination through the supplementary examination having failed in one subject only the total aggregate marks being carried over for determining the division shall include the actual marks obtained in the subject in which he appeared at the supplementary examination.

10. Successful exminees at the Part-III examination obtaining 60% or more marks shall be placed in the First division, those obtaining less than 60% but not less than 45% marks in the Second division and other successful examinees in the third division.

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SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks		Min. Marks
A.	**Compulsory Subject - Foundation Course :**				
	Hindi Language	I	75		26
	English Language	**I**	75		26
B.	**Three Core Subject :**				
1.	Hindi Literature	I	75		
		II	75	150	50
2.	Sanskrit Literature	I	75		
		II	75	150	50
3.	English Literature	I	75		
		II	75	150	50
4.	Philosophy	I	75		
		II	75	150	50
5.	Economics	I	75		
		II	75	150	50
6.	Political Science	I	75		
		II	75	150	50
7.	History	I	75		
		II	75	150	50
8.	Ancient Indian History	I	50		
	Culture & Archaeology	II	50	100	50
			Practical	50	17
9.	Sociology	I	75		
		II	75	150	50
10.	Geography	I	50		
		II	50	100	50
			Practical	50	17
11.	Mathematics	I	50		
		II	50	150	50
		III	50		
12.	Statistics	I	50		
		II	50	100	33
			Practical	50	17

	Subject	Paper		Max. Marks	Min. Marks
13.	Anthropology	I	50	100	33
		II	50		
			Practical	50	17
14.	Linguistics	I	75	150	50
		II	75		
15.	Indian Music	I	50	100	33
		II	50		
			Practical	50	17
16.	Home Science	I	50	100	33
		II	50		
			Practical	50	17
17.	Education	I	75	150	50
		II	75		
18.	Psychology	I	50	100	33
		II	50		
			Practical	50	17
19.	Management	I	75	150	50
		II	75		
20.	Defence Studies	I	50	100	33
		II	50		
			Practical	50	17
21.	Urdu	I	75	150	50
		II	75		

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examnination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986-

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the university or examination centres.
3. Calculators with, memory and following variables be permitted +, -, x, ¸ square, reciprocal, expotentials log, square root, trignometric functions, wize, sine, cosine, tangent etc. factiorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

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बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.
भाग – तीन, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा)

पूर्णांक– 75

इकाई–एक **(क)** भारत माता : सुमित्रानंदन पंत

(ख) कथन की शैलियॉ

1. विवरणात्मक शैली
2. मूल्यांकन शैली
3. व्याख्यात्मक शैली
4. विचारात्मक शैली

इकाई–दो **(क)** सूखी डाली : उपेन्द्रनाथ अश्क

(ख) विभिन्न संरचनाएँ

1. विनम्रता सूचक संरचना
2. विधि सूचक संरचना
3. निषेध परक संरचना
4. काल–बोधक संरचना
5. स्थान–बोधक संरचना
6. दिशा बोधक संरचना
7. कार्य–कारण सम्बन्ध संरचना
8. अनुक्रम संरचना

इकाई–तीन **(क)** वसीयत : मालती जोशी

(ख) कार्यालयीन पत्र और आलेख

1. परिपत्र
2. आदेश
3. अधिसूचना
4. ज्ञापन
5. अनुस्मारक
6. पृष्ठाकंन

इकाई–चार **(क)** योग की शक्ति : हरिवंश राय बच्चन

(ख) अनुवाद : स्वरूप एवं परिभाषा, उद्देश्य
स्त्रोत भाषा और लक्ष्य भाषा,
अच्छे अनुवाद की विशेषताएँ,
अनुवाद प्रक्रिया, अनुवादक

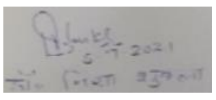
इकाई–पांच **(क)** संस्कृति और राष्ट्रीय एकीकरण : योगेश अटल

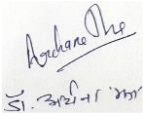
(ख) घटनाओं, समारोहों आदि का प्रतिवेदन, विभिन्न प्रकार के निमंत्रण पत्र

मूल्यांकन योजना : प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरित विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे। इसलिए प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 अंक होंगे। प्रश्नपत्र का पूर्णांक 75 निर्धारित है।

5/7/2024

डॉ आशा दीवान





Foundation Course-III

English Language

B.A./B.Sc./B.Com./B.H.Sc./III

M.M. 75

The question paper for B.A./B.Sc./B.Com./B.H.Sc. III Foundation course, English Language and General Answers shall comprise the following items :

Five question to be attempted, each carrying 3 marks.

UNIT-I	Essay type answer in about 200 words. 5 essay type question to be asked three to be attempted.	15
UNIT-II	Essay writing	10
UNIT-III	Precise writing	10
UNIT-IV (a)	Reading comprehension of an unseen passage	05
(b)	Vocabulary based on text	10
UNIT-V	Grammar Advanced Exercises	25

Note: Question on unit I and IV (b) shall be asked from the prescribed text. Which will comprise of popular create writing and the following items. Minimum needs housing and transport Geo-economic profile of M.P. communication Educate and culture. Women and Worm in Empowerment Development, management of change, physical quality of life. War and human survival, the question of human social value survival, the question of human social value, new Economic Philosophy Recent Diberaliation Method) Demoration decentralization (with reference to 73, 74 constitutional Amendment.

Books Prescribed:

Aspects of English Language and Development - Published by M.P. Hindi Granth Academy, Bhopal.

बी. ए. भाग– 3

हिन्दी साहित्य

प्रथम प्रश्न पत्र

जनपदीय भाषा– साहित्य (छत्तीसगढ़ी)

प्रस्तावना–

हिन्दी केवल खड़ी बोली नहीं है, बल्कि एक बहुत बड़ा भाषिक समूह है। हिन्दी जगत में अनेक विभाषाएं, बोलियाँ और उपबोलियाँ विद्यमान हैं जिनमें सकल साहित्य सम्पदा है। इनके सम्यक अध्ययन और अन्वेषण की आवश्यकता है। जनपदीय भाषा छत्तीसगढ़ी निरन्तर विकास की ओर अग्रसर हो रही है अस्तु, इस भाषा का और इसमें रचित साहित्य का इतिहास– विकास स्पष्ट करते हुए इनसे संबंधित प्रमुख रचनाकारों का आलोचनात्मक अनुशीलन करना हिन्दी के वृहत्तर हित में होगा। छत्तीसगढ़ी भाषा का पाठ्यक्रम निम्न बिन्दुओं पर आधारित हैं–

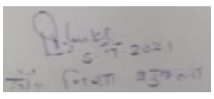
(क) छत्तीसगढ़ी भाषा का इतिहास– विकास
(ख) छत्तीसगढ़ी भाषा में रचित साहित्य का इतिहास
(ग) छत्तीसगढ़ी भाषा के प्रमुख प्राचीन एवं अर्वाचीन रचनाकारों की कृतियों का अध्ययन।

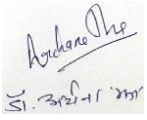
पाठ्य विषय–

रचनाएँ–

(1) प्राचीन कवि संत धर्मदास के 3 पद
   1. गुरू पइंया लागों नाम लखा दीजो हो।
   2. नैना आगे ख्याल घनेरा।
   3. भजन करौ भाई रे, अइसन तन पाय के।
   (सन्दर्भ– धर्मदास के शब्दावली से उद्घृत)
(2) लखनलाल गुप्त का गद्य–
   1. सोनपान
   (गद्य– पुस्तक' सोनपान' के उद्घृत)
(3) अर्वाचीन रचनाकार
   डॉ. सत्यभामा आडिल रचित गद्य
   1. सीख सीख के गोठ
   (गद्य पुस्तक 'गोठ' के उद्घृत)
(4) डॉ. विनय पाठक की कविताएँ–
   1. तँय उठथस सुरूज उथे
   2. एक किसिम के नियाव
   ('अकादसी और अनचिन्हार' पुस्तक से उद्घृत)
(5) मुकुन्द कौशल– छत्तीसगढ़ी गजल
   ''छै बित्ता के मनखे देखों..... से– मछरी मन लाख लेथे'' तक
   (पुस्तक' छत्तीसगढ़ी गजल' के पृष्ठ 17 से उद्घृत)

5/7/2021 डॉ आशा दीवान





द्रुतपाठ के रचनाकार– (व्यक्तित्व एवं कृतित्व)

1. सुन्दर लाल शर्मा
2. कपिलनाथ कश्यप
3. रामचन्द्र देशमुख (रंगकर्मी)

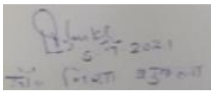
अंक विभाजन– व्याख्याएं (3)	– 21 अंक
आलोचनात्मक प्रश्न (2)	– 24 अंक
लघुउत्तरीय प्रश्न (5)	– 15 अंक
वस्तुनिष्ठ (15)	– 15 अंक
कुल अंक	75

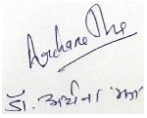
इकाई विभाजन

इकाई एक	–	व्याख्या
इकाई दो	–	प्राचीन एवं अर्वाचीन रचनाकार
इकाई तीन	–	(अ) छत्तीसगढ़ी भाषा का इतिहास
		(ब) छत्तीसगढ़ी साहित्य का इतिहास
इकाई चार	–	द्रुत पाठ के तीन रचनाकार
इकाई पाँच	–	वस्तुनिष्ठ / (सम्पूर्ण पाठ्यक्रम से)

5/7/2021

डॉ. आशा दीवान





बी.ए. भाग– 3

द्वितीय प्रश्न पत्र

हिन्दी भाषा– साहित्य का इतिहास तथा काव्यांग विवेचन

प्रस्तावना–

हिन्दी भाषा का इतिहास जितना प्राचीन है, उतना ही गुढ़– गहन भी। इसमें रचित साहित्य ने लगभग डेढ़ हजार वर्षो का इतिहास पूरा कर लिया है इसलिए हिन्दी भाषा और साहित्य के ऐतिहासिक विवेचन की बड़ी आवश्यकता है। इसी के साथ– साथ हिन्दी ने अपना जो स्वतंत्र साहित्य शास्त्र निर्मित किया हैं, उसे भी रूपायित करने की आवश्यकता है। इसके संज्ञान द्वारा विद्यार्थी की मर्मग्राहिणी प्रतिभा का विकास होगा और ऐतिहासिक परिप्रेक्ष्य में शुद्ध साहित्यिक विवेक का सन्निवेश होगा।

पाठ्य विषय–

(क) हिन्दी भाषा का स्वरूप विकास– हिन्दी की उत्पत्ति, हिन्दी की मूल आकर भाषाएँ तथा विभिन्न विभाषाओं का विकास। हिन्दी भाषा के विभिन्न रूप–

1. बोलचाल की भाषा
2. रचनात्मक भाषा
3. राष्ट्रभाषा
4. राजभाषा
5. सम्पर्क भाषा
6. संचार भाषा

हिन्दी का शब्द भण्डार– तत्सम, तद्भव, देशज, आगत शब्दावली।

(ख) हिन्दी साहित्य का इतिहास :– आदिकाल, पूर्व मध्यकाल, उत्तर मध्यकाल और आधुनिक काल की सामाजिक , सांस्कृतिक पृष्ठभूमि, प्रमुख युग प्रवृत्तियाँ, विशिष्ट रचनाकार और उनकी प्रतिनिधि कृतियाँ, साहित्यिक विशेषताएँ।

(ग) काव्यांग – काव्य का स्वरूप एवं प्रयोजन।
रस के विभिन्न भेद, विभिन्न अंग, विभावादि तथा उदाहरण।

प्रमुख 5 छंद – दोहा, सोरठा, चौपाई, कुण्डलियाँ, सवैया।

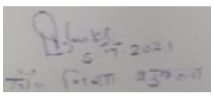
शब्दालंकार – अनुप्रास, यमक, श्लेष, वक्रोक्ति, पुररूक्ति प्रकाश।

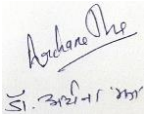
अर्थालंकार – उपमा, रूपक, उत्प्रेक्षा, अतिशयोक्ति, भ्रांतिमान।

संदर्भ ग्रन्थ–

(1) हिन्दी साहित्य का इतिहास संपादक– डॉ. सुशील त्रिवेदी व बाबूलाल शुक्ल (प्रकाशक– म. प्र. उ. शि. अनुदान आयोग)

5/7/2021 डॉ आशा दीवान





(2) राजभाषा हिन्दी– मलिक मोहम्मद (प्रभात प्रकाशन दिल्ली)
(3) हिन्दी भाषा– डॉ. भोलानाथ तिवारी।

अंक विभाजन–

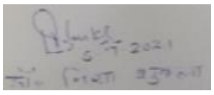
आलोचनात्मक (4)	–44 अंक
लघुउत्तरीय प्रश्न (4)	– 16 अंक
वस्तुनिष्ठ प्रश्न (15)	– 15 अंक
	कुल अंक – 75 अंक

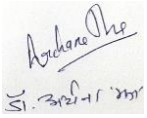
इकाई विभाजन–

इकाई– 1 हिन्दी भाषा का स्वरूप– विकास– (खण्ड– 'क')
इकाई– 2 हिन्दी का शब्द भण्डार– (खण्ड 'क' का अंतिम भाग)
इकाई– 3 हिन्दी साहित्य का इतिहास– (खण्ड– ख)
इकाई– 4 काव्यांग– रस, छंद, अंलकार (भाग– ग)
इकाई– 5 लघुउत्तरीय एवं वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)

5/7/2021

डॉ आशा दीवान





प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व
Ancient India History, Culture and Archaeology

बी.ए. तृतीय वर्ष
प्राचीन भारतीय इतिहास, संस्कृति तथा पुरातत्व
प्रथम : प्रश्न–पत्र
B.A. Part III Paper I
भारतीय वास्तु तथा कला के मूल तत्व (पेपर कोड 0266)
Elements of Ancient Indian Architecture and Art

पूर्णांक : 50

इकाई– 1 हड़प्पा कालीन वास्तु, मौर्य कालीन वास्तु, स्तूप वास्तु (सांची, भरहुत तथा अमरावती), पश्चिमी भारत के चैत्यगृह तथा विहार– भाजा, कालें, कोण्डाने, अजंता और एलोरा।
(Architecture of Harappan period, Mauryan period; Stupa Architecture (Sanchi, Bharhut and Amravati), Chaityas and Viharas of Western India (Bhaja, Karle, Konden, Ajanta and Ellora)

इकाई– 2 मंदिर वास्तु का उद्‌भव एवं विकास, मंदिर वास्तु की विभिन्न शैली–नागर, बेसर एवं द्रविड़।
(Origin and development of Temple Architecture, Various Styles of Temple Architecture – Nagara, Vessara & Dravida)

इकाई– 3 मूर्तिकला–हड़प्पा कालीन, मौर्यकालीन, शुंभकालीन, कुषाण कालीन (गांधार एवं मथुरा)।
(Iconography – Harappa period, Mauryan period, Shunga period, Kushana period (Gandhara & Mathura)

इकाई– 4 प्राचीन भारत में मूर्ति पूजा का उद्‌भव एवं विकास (विष्णु, शिव, बौद्ध एवं जैन प्रतिमा के विशेष संदर्भ में)।
(Origin and development of idol worship in Ancient India, with special reference to Vishnu, Shiva, Jaina & Buddhist sculptures)

इकाई– 5 प्रागैतिहासिक चित्रकला, सिघंनपुर की चित्रकला, काबरा पहाड़ एवं अंजता और बाघ की चित्रकला।
(Pre-historic paintings, Painting of Singhanpur and Kabrapahar, Ajanta & Bagh Paintings)

अनुशंशित ग्रंथ :

1. वासुदेव शरण अग्रवाल – भारतीय कला भाग–1
2. रामनाथ मिश्र – भारतीय मूर्तिकला
3. कृष्णदत्त बाजपेयी – भारतीय वास्तुकला का इतिहास
4. वासुदेव उपाध्याय – प्राचीन भारतीय स्तूप, गुहा एवं मंदिर
5. कृष्णदत्त बाजपेयी एवं संतोष कुमार बाजपेयी – भारतीय कला
6. सच्चिदानंद पांडेय – मंदिर स्थापत्य का इतिहास
7. जयनारायण पांडेय – भारतीय कला
8. मारूतिनंदन प्रसाद तिवारी तथा कमल गिरी – भारतीय प्रतिमा विज्ञान
9. ए.एल. श्रीवास्तव – भारतीय कला
10. A.. Coomarswami - History of Indian and Indonesian Art
11. Percy Brown - Indian Architecture, Vol. I
12. Krishnadeva - Temples of North India
13. S.Kramrisch - Hindu Temple Part I & II

बी.ए. तृतीय वर्ष

द्वितीय : प्रश्न–पत्र (अ)

B.A. Part III Paper II (A)

भारतीय पुरातत्व के मूलतत्व (पेपर कोड 0267)

Elements of Indian Archaeology

पूर्णांक : 50

इकाई– 1 पुरातत्व विज्ञान की परिभाषा, विस्तार क्षेत्र का अध्ययन, अन्य विषयों से संबंध।
(Definition, extent and relationship of Archaeology with other branches of Studies)

इकाई– 2 भारत में पुरातत्व का इतिहास, प्राचीन स्थलों की खोज एवं तिथि निर्धारण।
(History of Indian Archaeology, Discovery of Ancient Sites and Dating Methods)

इकाई– 3 उत्खनन–विधियॉ, सर्वेक्षण, स्तर विन्यास, उत्खनन का लेखा–जोखा।
(Methods of Excavation, Survey, Stratification, Documentation of excavation)

इकाई– 4 भृदभाण्ड, गैरिक भृदभाण्ड, चित्रित धूसर भृदभाण्ड, काले और लाल भृदभाण्ड, उत्तरी कृष्ण मर्जित भृदभाण्ड (एन.वी.पी.)।
(Pottery: Ochre Coloured Pottery (O.C.P.), Painted Grey Ware (P.G.W.), Black & Red Ware (B.R.W.), Northern Black Polished Ware (N.B.P.W.)

इकाई– 5 प्रमुख पुरास्थलों का अध्ययन–
कालीबंगा, एरण, कौशाम्बी, हस्तिनापुर, ब्रह्यगिरी, सिरपुर, मल्हार।
(Important Archaeological sites: Kalibangan, Eran, Koshambi, Hastinapur, Brahmgiri, Sirpur, Malhar)

अनुशंशित ग्रंथ :

1. के.डी. बाजपेयी – मध्यप्रदेश का पुरातत्व
2. आर.एम. व्हीलर – पृथ्वी से पुरातत्व
3. बी.एन.पुरी – पुरातत्व विज्ञान
4. जयनारायण पाण्डेय – पुरातत्व विमर्श
5. राकेश प्रकाश पाण्डेय – पुरातत्व विज्ञान
6. मदन मोहन सिंह – पुरातत्व की रूपरेखा

''अथवा''

बी.ए. तृतीय वर्ष

द्वितीय : प्रश्न–पत्र (ब)

B.A. Part III Paper II (B)

(ब) पुराभिलेख एवं मुद्राशास्त्र के मूल तत्व (पेपर कोड 0268)

Elements of Palaeography and Numismatics

पूर्णांक : 50

इकाई– 1 (1) प्राचीन भारतीय इतिहास की पुनर्रचना में अभिलेखों का महत्व।
(Significance of Epigraphy for writing Ancient Indian History)
(2) लेखन कला का उद्‌भव एवं विकास।
(Origin and development of writing skill)
(3) अभिलेखों में प्रयुक्त भाषायें, लिपियॉ तथा सामग्री।
(Languages, Scripts and materials used for Inscriptions)

इकाई– 2 निम्नलिखित अभिलेखों का ऐतिहासिक महत्व : (Historic significance of the following Inscription)
(1) अशोक का द्वितीय शिलालेख। (2^{nd} rock edict of Ashoka)
(2) अशोक का बारहवां शिलालेख। (12^{th} rock edict of Ashoka)
(3) हेलियोडोरस का बेसनगर स्तम्भलेख। (Besnagar Pillar Inscription of Heliodorus)
(4) गौतमी पुत्र सातकर्णी का नासिक अभिलेख। (Nasik Inscription of Gautamiputra Satkarni)
(5) खारवेल का हाथिगुफा अभिलेख। (Hanthigumpha Inscription of Kharvela)
(6) रूद्र दामन का जूनागढ़ (Junagarh Inscription of Rudradaman)

इकाई– 3 (1) समुद्र गुप्त का प्रयाग प्रशस्ति अभिलेख। (Allahabad Pillar Inscription of Samudragupta)
(2) पुलकेशिन द्वितीय का एहोल लेख। (Aihole Inscription of Pulakeshin – II)
(3) हर्ष का बांसखेड़ा अभिलेख। (Banskhera Inscription of Harsha)
(4) महारानी वासटा का लक्ष्मण मंदिर अभिलेख। (Lakshman temple Inscription of Queen Vasta)
(5) जाजल्ल देव प्रथम का रतनपुर अभिलेख। (Ratanpur Inscription of Jajalladeva)

इकाई– 4 इतिहास की पुर्नरचान में मुद्रा का महत्व, मुदा का उद्‌भव एवं प्राचीनता, मुद्रा निर्माण तकनीक तथा आहत सिक्के ।
(Significance of Numismatics for writing Ancient Indian History, Origin and antiquity of Coins, Minting Techniques of Coins, Punch-Marked Coins)

इकाई– 5 कुषाण कालीन सिक्के, जनपदीय सिक्के (तक्षशिला, कौशाम्बी, एरण), गुप्त कालीन मुद्रायें, समुद्र गुप्त, चन्द्रगुप्त द्वितीय, एवं कुमारगुप्त की स्वर्ण रजत एवं ताम्र मुद्राये स्थानीय मुद्राये शरभपुरीय, नलवंशीय एवं कलचुरी राजवंश।
Kushana Coins, Janpada Coins (Taxila, Kaushambi, Eran), Gupta coins, Gold, Silver and Copper coins of Samudragupta, Chandragupta-II and Kumaragupta; Regional coins: Sharabhpuriya, Nala, Kalachuri)

अनुशंशित ग्रंथ :

1. डी.सी.सरकार – इंडियन एपिग्राफी
2. डी.सी.सरकार – सेलेक्ट इन्सक्रिप्शन्स भाग 1 व 2
3. एस.एच.दानी – इंडियन पैलियोग्राफी
4. वासुदेव बाजपेयी – प्राचीन भारतीय अभिलेखों का अध्ययय
5. कृष्णदत्त बाजपेयी, कन्हैयालाल अग्रवाल संतोष कुमार बाजपेयी –ऐतिहासिक भारतीय अभिलेख
6. परमेश्वरी लाल गुप्ता – प्राचीन भारतीय मुद्राऍ
7. डी.सी.सरकार – स्टडीज एवं इंडियन क्वाएन्स
8. ए.के.शरण – ट्राइबल क्वाएन्स
9. भास्कर चट्‌टोपाध्याय – द एज ऑफ दि कुषाणजःए न्यूमिस्मेटिक स्टडी
10. ए.एस. अल्तेकर – गुप्तकालीन मुद्राऍ
11. राजवंत राव – प्राचीन भारतीय मुद्राऍ

प्रायोगिक तथा मौखिक परीक्षा

पूर्णांक – 50

1. किसी महत्वपूर्ण पुरातात्विक/ऐतिहासिक स्थान का भ्रमण एवं विवरण प्रस्तुति – 20 अंक
2. पुरावस्तुओं की पहचान – 20 अंक
3. मौखिकी – 10 अंक

योग – 50 अंक

B.A.-III

ENGLISH LITERATURE

PAPER -I

INDIAN WRITING IN ENGLISH **M.M.: 75**

All questions are compulsory.

Note: 1. Unit - I is compulsory. Two passages from each of the Unit II to V to be set Three to be attempted. (3x5 = 15)

2. Short answer questions from unit VII, Seven to be set and five to be attempted. (5x2 = 10)

3. Long-answer questions from unit II to VI. Two questions from each unit with an internal choice to be set. The candidate has to attempt one question from each unit. (5x10 = 50)

UNIT-I Annotations and short answer questions

UNIT-II Poetry

Toru Dutt	-	Our Casurina Tree	(Non-Detailed)
Rabindranath Tagore	-	Songs 1 & 103 from Gitanjali	(Detailed)
Sarojini Naidu	-	The Ecstasy, The Lotus	(Detailed)

UNIT-III

Kamla Das	-	The Old Playhouse	(Detailed)
	or		
Gauri Deshpandey	-	The Female of the Species	(Non-Detailed)
Jayant Mahapatra	-	Dawn at Puri	(Detailed)
	or		
K. N. Daruwala	-	Death by Burial	(Non-Detailed)
Shiv K. Kumar	-	Indian Women	(Non-Detailed)

UNIT-IV Prose

Nirad C. Choudhary	-	My Birth Place	(Detailed)
Dr. S. Radhakrishnan	-	The Call of the Suffering	(Non-Detailed)

UNIT-V Drama

Girish Karnad	-	Hayavadana	(Detailed)
	or		
Vijay Tendulkar	-	Silence! The Court is in Session	(Non-Detailed)

UNIT- VI Fiction

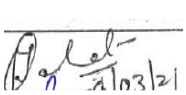
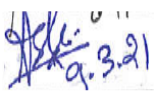
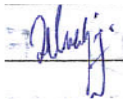
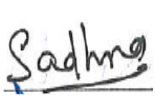
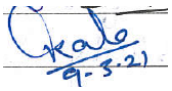
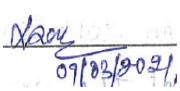
R.K. Narayan	-	The Guide	(Non-Detailed)

UNIT-VII

1. Lyric
2. Subjective Poetry
3. Couplet
4. Fable
5. Hymn
6. Allegory
7. Autobiography

BOOK RECOMMENDED:

1. Indian Poetry in English, Ed. Hari Mohan Prasad, Sterling Publication
2. An Introduction to the Study of English Literature, B. Prasad.
3. A Glossary of Literary Terms, M. H. Abrahams.
4. Prose of Today - Macmillan Publishers

Paper-II
(A) AMERICAN LITERATURE
(Paper Code -0236)

M.M.: 75

All questions are compulsory.

Note: 1. Unit -I is compulsory. Two passages from each of the Unit II to V to be set Three to be attempted. **(3x5 = 15)**

2. Short answer questions from unit VII, Seven to be set and five to be attempted. **(5x2 = 10)**

3. Long-answer questions from unit II to VI. (Word limit for each answer is 300-400 words) Internal choice to be given. **(5x10 = 50)**

UNIT-I

Annotations and short answer question.

UNIT-II Poetry

Walt Whitman	-	O Captain! My Captain, When the Lilacs Last in the Dooryard Bloom'd.	(Non-Detailed)
Carl Sandberg	-	Who Am I? I am the People, The Mob	(Detailed)

UNIT-III

Emily Dickinson	-	"Hope" is the thing with Feather, I Felt a funeral in my Brain	(Detailed)
E. E. Cummings	-	The Cambridge Ladies, As Freedom is a Breakfast food	(Detailed)

UNIT-IV Prose

William Faulkner	-	Nobel Award Acceptance Speech	(Detailed)
W. Carlos Williams	-	In the American Grain	(Non-Detailed)
Walt Whitman	-	Preface to "Leaves of Grass"	(Detailed)

UNIT-V Drama

A. Miller	-	All My Sons	(Non-Detailed)
	Or		
Eugene O' Neill	-	The Hairy Ape	(Detailed)

UNIT-VI Fiction

E. Hemingway	-	A Farewell to Arms	(Non-Detailed)
	Or		
W. Faulkner	-	The Sound and the Fury	(Non-Detailed)

UNIT-VII 1. Naturalism 2. Realism 3. Art for Art's sake 4. Poetic-Drama 5. Symbolism 6. American Renaissance 7. Existentialism.

BOOK RECOMMENDED:

1- American Literature, An Anthology, Ed. Fr. Egbert S. Oliver.

2- A Glossary of Literary Terms - M.H. Abrahams.

Paper-II

(B) 20TH CENTURY LITERATURE IN ENGLISH

(Paper Code -0237) **M.M.: 75**

The paper will be taught as an optional paper to Paper-II (A) which is a paper on American Literature. It is to give to the students a general background and cultural history of this period and also to make them aware of the literary trends of the twentieth century. The Paper comprises of six units and in all Six questions are to be attempted.

UNIT-I The following historical and literary topics will be included in this unit. Students are required to write short notes of not more than three hundred words on any two of the following topic. **(10 Marks)**

i) The Two World Wars
ii) The Russian Revolution
iii) The Great Depression
iv) The Vietnam War.
v) Freudian Thought
vi) Existentialism.
vii) Absurdism.
viii) Modernism and Post Modernism.
ix) New Development in Fiction and Drama.

UNIT-II Ten objective type questions on the life history and major poetical works of the following Poets of the twentieth century will be asked in this unit. **(10 Marks)**

i) W. B. Yeats (1865-1939)
ii) Siegfried Sasson (1886-1967)
iii) Rupert Brooke (1887-1915)
iv) T.S. Eliot (1888-1965)
v) Wilfred Owen (1893-1918)
vi) W.H. Auden (1907-1937)
vii) Louis MacNeice (1907-1963)
viii) Stephen Spender (1909-1995)
ix) Dylan Thomas (1914-1953)
x) Philip Larkin (1922-1985)

UNIT-III **(15 marks)**

T.S. Eliot	-	The Waste Land
	Or	
Wilfred Owen	-	Disabled
Siegfried Sassoon	-	Attack, Falling Asleep
Rupert Brooke	-	The Hill
W. H. Auden	-	Miss Gee

UNIT-IV **(15 marks)**

Joseph Conrad	-	Heart of Darkness
	Or	
Chinua Achebe	-	Things Fall Apart

UNIT-V Non Fictional Prose **(10 marks)**

Virginia Woolf	-	The Death of the Moth
	Or	
Graham Greene	-	The Lost Childhood

UNIT-VI Drama **(15 marks)**

Bernard Shaw	-	Pygmalion
	Or	
Samuel Beckett	-	Waiting for Godot

BOOK RECOMMENDED:

1. Edited by Michael Roberts, The Faber Book of Modern Verse.
2. Macmillan, Prose of Today.
3. William J. Long, English Literature.

बी.ए. अन्तिम वर्ष

संस्कृत साहित्य

टीप – बी.ए. अंतिम वर्ष में संस्कृत साहित्य के दो प्रश्न–पत्र होंगें एवं दोनों प्रश्न –पत्र 75– 75 अंकों के होंगें ।

प्रथम प्रश्नपत्र

नाटक, छन्द तथा व्याकरण पूर्णांक – 75

इकाई –1 अभिज्ञानशाकुन्तलम् (नाटक) अंक – 15
दो श्लोकों की व्याख्या
(प्रथम, चतुर्थ, पंचम तथा सप्तम अंक से व्याख्या, शेष द्रुतपाठ)

इकाई –2 अभिज्ञानशाकुन्तलम् – समीक्षात्मक प्रश्न अंक – 15

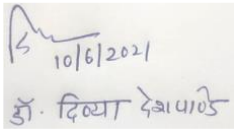
इकाई –3 निर्धारित छन्दों के लक्षण तथा उदाहरण – अंक – 15
अनुष्टुप्, इन्द्रवज्रा, उपेन्द्रवज्रा, उपजाति, वंशस्थ, आर्या, मालिनी, शिखरिणी, वसन्ततिलका, शार्दूलविक्रीडित, स्त्रग्धरा, मन्दाक्रान्ता ।

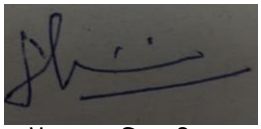
इकाई –4 व्याकरण – लघुसिद्धान्तकौमुदी अंक – 15
कृदन्त प्रकरण
तव्यत्, अनीयर्, यत्, क्यप्, ण्यत्, शतृ, शानच्, क्त्वा, ल्यप् ,
तुमुन्, क्त, क्तवतु, ण्वुल्, तृच्, ल्युट्, अण् ।

इकाई –5 व्याकरण – लघुसिद्धान्तकौमुदी अंक – 15
1.तद्धितप्रत्यय –
अण्, ढक्, ष्यञ्, त्व, तल्, इमनिच्, ठक्, इञ्, मतुप्
इनि, इतच्, ईयसुन्, इष्ठन्, तरप्, तमप्, ण्य, यञ् ।
2.स्त्रीप्रत्यय –
टाप् , ङीप् , ङीष् , ङीन् ।

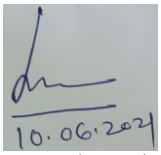
अनुशंसित ग्रन्थ –

1. अभिज्ञानशाकुन्तलम् – कालिदास, प्रकाशक – मोतीलाल बनारसीदास, वाराणसी
2. छन्दोमंजरी – प्रकाशक – चौखम्बा विद्याभवन, वाराणसी
3. लघु सिद्धान्त कौमुदी – श्रीधरानन्द शास्त्री
4. लघु सिद्धान्त कौमुदी – श्री महेश सिंह कुशवाहा, प्रकाशक – चौखम्बा विद्याभवन, वाराणसी
5. शीघ्रबोधव्याकरणम् – डा. पुष्पा दीक्षित, पाणिनीय शोध संस्थान, तेलीपारा, बिलासपुर
6. संस्कृत हिन्दी कोश – वामन शिवराम आप्टे, प्रकाशक – मोतीलाल बनारसीदास,





डॉ सुषमा तिवारी



श्री एम. के. अलेन्द्र

बी.ए. अन्तिम वर्ष

संस्कृत

द्वितीय प्रश्नपत्र

काव्य, अलंकार तथा निबन्ध पूर्णांक – 75

इकाई –1 किरातार्जुनीयम् (भारवि) प्रथमसर्ग अंक – 15
दो श्लोकों की ससन्दर्भ व्याख्या

इकाई –2 किरातार्जुनीयम् – आलोचनात्मक प्रश्न अंक – 15

इकाई –3 मूलरामायणम् –वाल्मीकि अंक – 15
व्याख्या अथवा आलोचनात्मक प्रश्न

इकाई –4 अलंकार – अंक – 15
अनुप्रास, यमक, शब्दश्लेष, उपमा, रूपक, उत्प्रेक्षा, अनन्वय, अर्थान्तरन्यास, स्वभावोक्ति, अतिशयोक्ति, दीपक, विभावना, विशेषोक्ति, अपह्नुति, दृष्टान्त, निदर्शना, प्रतिवस्तूपमा, सन्देह, भ्रान्तिमान् , काव्यलिंग ।

टिप्पणी – अलंकारों के लक्षण चन्द्रालोक, काव्यप्रकाश अथवा साहित्यदर्पण से अध्येतव्य हैं, उदाहरण पाठ्यक्रमों से भी दिये जा सकते हैं ।

इकाई –5 निबन्ध (संस्कृत भाषा में) 15 वाक्यों में अंक – 15
टिप्पणी – निबन्ध समीक्षात्मक अथवा विश्लेषणात्मक न होकर वर्णनात्मक पूछे जायेंगे ।

अनुशंसित ग्रन्थ –

1. संस्कृतनिबन्धशतकम् – डॉ . कपिलदेव द्विवेदी, चौखम्बा प्रकाशन, वाराणसी
2. निबन्धपारिजात – डॉ. रजनीकान्त लहरी, चौखम्बा प्रकाशन, वाराणसी
3. प्रबन्धरत्नाकर – डॉ. रमेशचन्द्र शुक्ल, चौखम्बा प्रकाशन, वाराणसी
4. रचनानुवादकौमुदी – डॉ. कपिलदेव द्विवेदी, चौखम्बा प्रकाशन, वाराणसी

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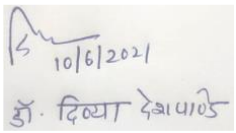
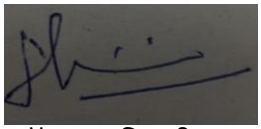
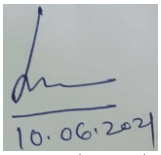




डॉ सुषमा तिवारी



श्री एम. के. अलेन्द्र

बी. ए. भाग 3 B.A. Part III

राजनीति विज्ञान Political Science

प्रथम प्रश्नपत्र : अन्तर्राष्ट्रीय राजनीति एवं भारत की विदेश नीति

Paper I : Internatioal Politics and Foreign Policy of India

इकाई 1 : अन्तर्राष्ट्रीय राजनीति : अर्थ, प्रकृति, क्षेत्र ।

अन्तर्राष्ट्रीय राजनीति : अध्ययन उपागम – यथार्थवाद, आदर्शवाद, नवयथार्थवाद, विश्व व्यवस्था सिद्धान्त । राष्ट्रीय हित एव राष्ट्रीय शक्ति : अर्थ, परिभाषा एवं तत्व ।

Unit 1 : International Politics : meaning, Nature, Scope. International Politics : Approaches to the study : Realism, Idealism, New realism, World System theory. National interest and National power: Meaning Definition and Elements.

इकाई 2 : अन्तर्राष्ट्रीय राजनीति के विभिन्न सिद्धान्त : व्यवस्था, खेल, निर्णय निर्माण,सौदेबाजी का सिद्धान्त ।

शक्ति संतुलन । सामूहिक सुरक्षा । निशस्त्रीकरण । शीतयुद्ध । राजनय ।

Unit 2 : Various theories of International Politics : System, Game, Decision making, Barganing theory. Balance of Power, Collective Security, Disarmament, Cold war, Diplomacy.

इकाई 3 : भारत की विदेश नीति : निर्धारक तत्व, विशेषताएं । गुटनिरपेक्षता : अर्थ, विशेषताएं, प्रासंगिकता ।

Unit 3 : Foreign Policy of India : Determinating elements, characteristics. Non-alignment : meaning, features , relevance.

इकाई 4 : भारत का पडोसियों से सम्बंध –चीन,पाकिस्तान,नेपाल,श्रीलंका। भारत का महाशक्तियों से सम्बंध – संयुक्त राज्य अमेरिका, रुस, ब्रिटेन एवं फ्रांस

Unit 4 : Indias' relations with neighboring countries : China , Pakistan, Nepal, Sri lanka, Relations with Super Powers - USA, Russia, Britain and France.

इकाई 5 : अन्तर्राष्ट्रीय राजनीति के कुछ प्रमुख मुद्दे :

पर्यावरणवाद । अन्तर्राष्ट्रीय आतंकवाद। वैश्वीकरण । मानव अधिकार । परमाणविक निशस्त्रीकरण ।

Unit 5 : Some major issues of International Politics :

Environmentalism, International Terrorism, Globalisation, Human Rights, Nuclear Disarmament.

01/07/2021 Sunita Mishra

बी.ए. अंतिम वर्ष
प्रथम प्रश्न पत्र
अंतर्राष्ट्रीय राजनीति एवं भारत की विदेश नीति

सन्दर्भ ग्रन्थ सूचीः–

क्र	पुस्तक का नाम	लेखक का नाम
1.	अन्तर्राष्ट्रीय राजनीति के सैद्धान्तिक पक्ष	महेन्द्र कुमार
2.	अन्तर्राष्ट्रीय राजनीति के सिद्धान्त एवं व्यवहार	यू.आर.घई
3.	अन्तर्राष्ट्रीय राजनीति सिद्धान्त समकालिन एवं मुद्दे	बी.एल. फाडिया
4.	अन्तर्राष्ट्रीय संबंध	पुष्पेष पन्थ
5.	अन्तर्राष्ट्रीय संबंध	दीनानाथ बर्मा
6.	थीयरी ऑफ इन्टरनेशनल पालिटिक्स	के.वाल्टज
7.	इन्टरनेशनल रिलेशन्स	जे.गोल्ड स्टीन
8.	द इन्टरनेशनल पालिटिक्स	पी.कलवरठ
9.	इन्टरनेशनल रिलेषन्स	सी.ब्राउन
10.	समकालीन विश्व एवं भारत	अरूणोदय बाजपेयी

Reference :-

- M.S. Agwani, **Détente: Perspectives and Repercussions,** Vikas, 1975
- John Gray, **False Dawn: The Delusions of Global Capitalism,** Grant Book, U.K. , 1998
- Hans J. Morgenthan, **Politics Among Nations: The Struggle for Power and Peace,** Scientific Book Agency, Calcutta, 1972
- Mahendra Kumar, **Theoretical Aspects of International Politics,** Agra: Shiva Lal Agarwala & Co. Educational Publishers
- K.J. Holsti, **International Politics: A Framework for Analysis,** Prentice Hall of India, New Delhi, 1995.
- Paul Kennedy, **Preparing for the Twenty-First Century,** New York, 1993
- Hutchings, Kimbley, **International Political Theory,** Sage, New Delhi
- John Baylis and Steve Smith, **The Globalization of World Politics**, Oxford University Press, 2008
- Karen Mingst, **Essentials of International Relations**, New York: W.W. Norton & Company, 2007
- Kate Kelly S. Pease, **International Organizations**, New Jersey: Prentice Hall, 2000

Robert Jackson and Georg Sørensen, **Introduction to International Relations: Theories and Approaches,** Oxford University Press, 2003

- Joshua S. Goldstein & Jon C. Pevehouse, **'International Relations'** 5th Edition, Pearson Education, 2002
- J. W. Burton, **'International Relations: A General Theory'**, Cambridge University Press, New York, 1965.

- M.S. Agwani, **Détente: Perspectives and Repercussions,** New Delhi: Vikas, 1975
- John Gray, **False Dawn: The Delusions of Global Capitalism,** Grant Book, U.K., 1998
- Hans J. Morgenthan, **Politics Among Nations: The Struggle for Power and Peace,** Calcutta, Scientific Book Agency, Calcutta, 1972
- Mahendra Kumar, **Theoretical Aspects of International Politics**
- K.J. Holsti, **International Politics: A Framework for Analysis,** Prentice Hall of India, New Delhi, 1995.
- Paul Kennedy, **Preparing for the Twenty-First Century,** New York, 1993
- Hutchings, Kimbley, **International Political Theory,** Sage, New Delhi, 2002
- Karen Mingst, **Essentials of International Relations**, New York: W.W. Norton & Company, 2007
- Kate Kelly S. Pease, **International Organizations**, New Jersey: Prentice Hall, 2000
- Robert Jackson and Georg Sørensen, **Introduction to International Relations: Theories and Approaches,** Oxford University Press, 2003
- Joshua S. Goldstein & Jon C. Pevehouse, **'International Relations'** 5th Edition, Pearson Education, 2002.
- J. W. Burton, **'International Relations: A General Theory'**, Cambridge University Press, New York, 1965.
- John Baylis & Steve Smith, **'Globalization of World Politics'** OUP, U.S.A. & Delhi, 2008.

Dr. Amita Bari 29.6.2021

01/07/2021

Sunita Mishra

डॉ. मणिमेखला राजला

बी. ए. भाग 3 B. A. Part III

राजनीति विज्ञान Political Science

द्वितीय प्रश्नपत्र : लोक प्रशासन Paper : II : Public Administration

इकाई 1 : लोक प्रशासन : अर्थ, परिभाषा, प्रकृति, क्षेत्र । लोक प्रशासन और निजी प्रशासन । अध्ययन पद्धतियां । नवीन लोक प्रशासन । तुलनात्मक लोक प्रशासन ।

Unit 1 : Public Administration : meaning and definition, nature, scope. Public Administration and Private Administration. Method of Studies. New Public Administration. Comparative Public Administration.

इकाई 2 : संगठन के सिद्धान्त : पदसोपान, नियंत्रण का क्षेत्र , आदेश की एकता, प्रत्यायोजन ।

मुख्य कार्यपालिका । सूत्र एवं स्टाफ अभिकरण । विभागीय संगठन , लोक निगम । कार्मिक प्रशासन

: भर्ती, पदोन्नति , प्रशिक्षण ।

Unit 2 : Principles of Organisation : Hierarchy, Span of Control, Unity of Command, Delegation. Chief Executive. Line and Staff Agencies. Departmental Organisation. Public Corporation. Personnel Administration : Recruitment, Promotion, Training.

इकाई 3 : विकास प्रशासन : प्रकृति, मुद्दे और विशेषताएं । रिग्स मॉडल । प्रशासन में नागरिक सहभागिता ।

सुशासन और ई शासन । संध लोक सेवा आयोग ।

Unit 3 : Development Administration : Nature, Issues, Characteristics.Riggs Model.

Public participation in Administration.Good Governance and

e- Governance. Union Public Service Commission.

इकाई 4 : वित्तीय प्रशासन : बजट के सिद्धान्त । भारत में बजट प्रक्रिया । भारत में प्रशासनिक सुधार ।

प्रशासन पर कार्यपालिका, विधायी, न्यायिक और जन नियन्त्रण ।

Unit 4 : Financial Administration: Principles of Budget. Budget procedure in India. Administrative reforms in India. Executive, Legislative, Judicial and Public Control on Administration.

इकाई 5 : प्रशासन में भ्रष्टाचार : आम्बुड्समैन, लोकपाल और लोक आयुक्त ।

वैश्वीकरण के युग में लोक प्रशासन । उदारीकरण । नौकरशाही । लोक सम्पर्क ।

Corruption in Administration: Ombudsman, Lokpal and Lok Ayukta.

Public Administration in the age of Globalisation. Liberalisation. Bureaucracy.

Dr. Amita Baal 29.6.2021

01/07/2021

Sunita Mishra

डॉ. मणिमेखला राम्ला

बी.ए. अंतिम वर्ष

द्वितीय प्रश्न पत्र

लोक प्रशासन

सन्दर्भ ग्रन्थ सूची:–

क्र	पुस्तक का नाम	लेखक का नाम
1.	लोक प्रशासन	अवस्थी और माहेश्वरी
2.	लोक प्रशासन सिद्धान्त एवं व्यवहार	सुषमा यादव और बलराम गौतम–(सम्पा)
3.	तुलनात्मक लोक प्रशासन	रमेश अरोड़ा
4.	लोक प्रशसन सिद्धान्त एवं व्यवहार	पी.डी. शर्मा और हरीशचन्द्र शर्मा
5.	वित्त प्रशासन	गौतम पद्मनाम
6.	लोक प्रशासन के सिद्धान्त	सी.पी. भामरी
7.	लोक प्रशासन	बी.एल. फाडिया
8.	प्रशासनिक सिद्धान्त	अवस्थी और अवस्थी

Reference :-

- Avasthi & S.R. Maheshwari: **Public Administration,** (Agra: L. N. Agrawal, latest Hindi and English editions)
- R. R. Jha: **Lokayukta : The Indian Ombudsman,** Rishi Publications, Varanasi, 1991
- F.A. Nigro and G.I. Nigro, **Modern Public Administration,** New York, Harper Row, 1980
- M. P. Sharma, B. L. Sadana, **'Lok Prashasan : Siddhanth Evam Vyavahar'**,(Allahabad: Kitab Mahal, Latest Hindi and English editions) .
- R. K. Arora & R. Goyal: **Indian Public Administration,** (New Delhi: Vishwa Prakashan, 2008).
- S. Kataria**,** **'Personnel Administration'**, (RBSA Publishers, Jaipur, 2003

Dr. Amita Bansal 29.6.2021 | 01/07/2021 | Sunita Mishra | डॉ. मणिमेखला शुक्ला

29.6.2021
Dr. Amita Bari

01/07/2021

Sunita Mishra

Mekhala
डॉ. मणिमेखला शुक्ला

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS

B. A. Part- III (Economics)

Subject: Development and Environmental Economics, Paper-I

UNIT 1

Economic Growth and Development: Factor affecting economic growth (Labour, capital and technology), Developed and under developed Economy, Poverty- absolute & relative, Marxian model of Economic Growth, Mahalanobis Model of Economic Growth. Balanced and unbalanced growth.

UNIT 2

Problems of Population and growth pattern of population. Theory of demographic transition. Population, poverty and environment. Schumpeter's theory of economic growth, Theory of Big-Push, Nelson's theory of low-level income equilibrium trap , Theory of Critical minimum efforts ,

UNIT 3

Harrod and Domar growth model, Solow's model of economic growth, Meades Neo classical models, , Mrs. Joan Robinson's growth model , A. Lewis theory of unlimited supply of labour.

UNIT 4

Environment: Environmental and use, environmental disruption as an allocation, problem. valuation of environmental damages- land, water , air & forest , prevention control and abatement of pollution, choice of policy instruments in developing countries, environmental legislation, indicators of sustainable development, environmental accounting

डॉ० निशा अग्रवाल डॉ० डी० पी० चुरेंद्र श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहण प्रसाद

UNIT 5

Concept of Intellectual Capital : Food Security, Education, Health & Nutrition, Role of agriculture in economic development, Land reforms, Efficiency & Productivity in Agriculture, new technology & Sustainable agriculture, Globalization & agriculture growth, the choice of technique appropriate technology & employment.

Reference :-

1. Behrman, S. And T.N. Shrinivasan (1995) "Hand book of Development Economics," Vol 1, 2, & 3 Elsevier; Amsterdam.
2. Ghatak,s (1986) "An introduction to development Economics", Allen & Elnein, London.
3. Sen, A.K. (Ed.) 1990 "Growth Economics", Penguin, Harmonds worth.
4. Mehrotra, S. And J. Richard (1998), Development with a Human Face, Oxford University Press new Delhi.

डॉ० दीक्षा अग्रवाल डॉ० डी० पी० चुरे श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहण प्रसाद

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

REVISED SYLLBUS
B.A. Part- III (Economics)
Subject: Statistical Methods, Paper-II

UNIT 1

Statistics : Definition of Statistics, Importance and Limitations of Statistics, Importance of Statistics in Economics, Statistical investigation, Census and sampling methods of statistical investigation, Statistical data, Collections of Data, Primary & Secondary Data.

UNIT 2

Measuring of Central Tendency: Mean, Median, Mode, measures of Skewness, Probability-basic concepts meaning and definitions

UNIT 3

Dispersion: Meaning of Dispersion, Methods of measuring Dispersion, Range, Quartiles Deviation ,Mean Deviation, Coefficient of Mean Deviation, Standard Deviation.

UNIT 4

Correlation Analysis: Meaning and types of correlation ,Degree of correlation, Coefficient of correlation-Karl Pearson's Method, Spearman's Rank Difference Method. Probable error and standard error.

UNIT 5

Index Number- Methods of constructing of Index Numbers, Fisher's methods, Dorbish-Bowles method, Paasches method, Laspeyres method**,** Consumer price index numbers, Reversal test, Circular Test, Time series analysis-Meaning, Components of time series, Measurement of long term trend by average method.

डॉ० रीमा अग्रवाल डॉ० डी० पी० चुरेंद्र श्रीमती सुशीला शर्मा डॉ० सुधा बाखला डॉ० रोहण प्रसाद

Reference :-

1. Shukla, S.M. and S.P. Sahay – "Quantitative Methods" Sahitya Bhawan Publication, Agra.
2. Agrawal, D.R., "Quantitative Methods", Vrinda Publications (P) Ltd.
3. Sancheti, D.C.," Quantitative Methods", Sultanchand and Sons, New Delhi.
4. Gupta, S.P. and others, "Qunatitative Techniques", Sultanchad and Sons, New Delhi.
5. मेहता एवं मदनानी, अर्थशास्त्र में प्रारंभिक गणित, लक्ष्मीनारायण अग्रवाल, आगरा–3
6. Dr. Amrendra, "An Introduction to Mathematical concepts in Economics", Pragtisheel Prakashan, New Delhi.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. तृतीय वर्ष
इतिहास
प्रश्न पत्र – प्रथम
भारत का इतिहास 1761 ई. से 1947 ई. तक

इकाई–1

1. भारत में यूरोपीयनों का आगमन
2. आंग्ल–फ्रांसीसी प्रतिस्पर्धा– कर्नाटक युद्ध
3. ब्रिटिश साम्राज्य का विस्तार – प्लासी एवं बक्सर युद्ध
4. ब्रिटिश साम्राज्य का विस्तार – वेलेजली की सहायक संधि, डलहौजी की हड़प नीति

इकाई–2

1. ब्रिटिश प्रशासनिक सुधार – लार्ड विलियम बोटिंक
2. लार्ड कर्जन का प्रशासन
3. यूरोपीय वाणिज्यवाद का भारत में प्रभाव–उद्योगों व व्यापार का पतन

इकाई–3

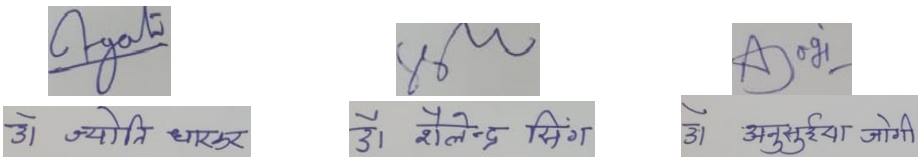
1. विभिन्न सामाजिक वर्ग–कृषक, मजदूर, महिलाएं
2. कृषि का पतन एवं कृषक आंदोलन
3. भूराजस्व व्यवस्थाएं – स्थायी बंदोबस्त, रैयतवाड़ी, महालवाड़ी
4. भारतीय पुनर्जागरण–ब्रह्मसमाज, आर्यसमाज
5. मुस्लिम समाज सुधार आंदोलन–अलीगढ़ आंदोलन

इकाई–4

1. रेल यातायात का उद्‌भव एवं विकास
2. हस्तशिल्प उद्योगों का पतन
3. ईस्ट इंडिया कंपनी का रियासतों से संबंध
4. पाश्चात्य शिक्षा का विकास एवं प्रेस

इकाई–5

1. ब्रिटिश नियंत्रण काल में छत्तीसगढ़ की प्रशासनिक व्यवस्था
2. ब्रिटिश कालीन प्रशासनिक व्यवस्था
3. छत्तीसगढ़ में सामाजिक सुधार–कबीर पंथ एवं सतनाम पंथ
4. छत्तीसगढ़ की जनजातीय संस्कृति



संदर्भ ग्रन्थ सूचीः–

1) एल.पी. शर्मा – आधुनिक भारत
(2) ए.आर. देसाई – आधुनिक राष्ट्रवाद की सामाजिक पृष्ठभूमि
(3) रजनी पामदत्त – इंडिया टुडे
(4) ग्रोवर एवं यशपाल – आधुनिक भारत का इतिहास एवं नवीन मूल्यांकन (1707–1969)
(5) एस.आर. शर्मा – मेकिंग आफ मार्डन इंडिया
(6) प्रताप सिंह – आधुनिक भारत–1, खंड–3
(7) एम.एस. जैन – आधुनिक भारत का इतिहास
(8) एस.पी. नायर – सोशल एंड इकॉनामिक हिस्ट्री आफ मॉडर्न इंडिया
(9) S.P. Nanda - Economic and Social History of Modern India
(10) V.A. Narain - Social History of Modern India
(11) एग्नेस ठाकुर – भारत का आर्थिक इतिहास (1757–1950)
(12) पुरी, दास, चोपड़ा –भारत का सामाजिक आर्थिक एवं सांस्कृतिक इतिहास
(13) अरूण भट्टाचार्य – हिस्ट्री आफ माडर्न इंडिया (1757–1947)
(14) नीलकंठ शास्त्री –एडवांस हिस्ट्री ऑफ इंडिया
(15) आर.सी. मजुमदार एवं एच.सी. राय – ऐन एडवांश हिस्ट्री ऑफ इंडिया
(16) कौलेश्वर राय – आधुनिक भारत 1757–195
(17) सीमा पाल – भारतीय संस्कृति एवं ब्रिटिश उपनिवेशवाद
(18) यशपाल एवं ग्रोवर – आधुनिक भारत का इतिहास
(19) शेखर बंदोपाध्याय – प्लासी से विभाजन तक
(20) दीलीप मेनन – आधुनिक भारत का इतिहास
(21) दीलीप मेनन –कल्चरल हिस्ट्री ऑफ मार्डन इंडिया
(22) ए.पी.सिंह – भारत में उपनिवेश
(23) घनश्याम शाह – भारत में सामाजिक आंदोलन
(24) किशोर अग्रवाल – बीसवीं शताब्दी का छत्तीसगढ़
(25) अशोक शुक्ला – छत्तीसगढ़ का राजनीतिक इतिहास
(26) भगवान सिंह वर्मा – छत्तीसगढ़ का इतिहास
(27) सुरेश चंद्र – छत्तीसगढ़ का समग्र इतिहास
(28) हीरालाल शुक्ल – छत्तीसगढ़ का जनजातीय इतिहास
(29) आभा पाल एवं डिश्वर नाथ खुटे – बस्तर का राजनीतिक, सामाजिक एवं आर्थिक इतिहास

डॉ. ज्योति धारकर डॉ. शैलेन्द्र सिंग डॉ. अनुसुईया जोगी

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. तृतीय वर्ष
इतिहास
प्रश्न पत्र – द्वितीय
भारत के राष्ट्रीय आन्दोलन का इतिहास 1857 ई. से 1947 ई. तक

इकाई–1

1. राष्ट्रवाद का उदय
2. 1857ई. की क्रांति : कारण एवं परिणाम
3. भारतीय राष्ट्रीय कांग्रेस की स्थापना – उद्देश्य, उदारवाद, उग्रवाद
4. बंगाल का विभाजन एवं स्वदेशी आंदोलन
5. क्रांतिकारी आंदोलन– प्रथम एवं द्वितीय चरण

इकाई–2

1. भारतीय राजनीति में साम्प्रदायिकता का उदय– मुस्लिम लीग की स्थापना
2. होमरूल आंदोलन
3. लखनऊ समझौता
4. गांधीवादी आंदोलन – असहयोग आंदोलन

इकाई–3

1. सविनय अवज्ञा आंदोलन
2. आदिवासी मजदूर एवं कृषक आंदोलन
3. भारत छोड़ो आंदोलन
4. आजाद हिन्द फौज

इकाई–4

1. भारत का विभाजन एवं स्वतंत्रता
2. रियासतों का विलिनीकरण
3. भारतीय संविधान की प्रमुख विशेषताएं
4. छत्तीसगढ़ में 1857ई. की क्रांति– नारायणसिंह एवं हनुमानसिंह

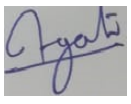
इकाई–5

1. बस्तर का मुरिया विद्रोह एवं भूमकाल आंदोलन
2. छत्तीसगढ़ में गांधीवादी आंदोलन
3. छत्तीसगढ़ में रियासतों का विलिनीकरण

डॉ. ज्योति धारकर | डॉ. शैलेन्द्र सिंग | डॉ. अनुसुईया जोगी

संदर्भ ग्रन्थ सूचीः–

(1) ताराचंद – भारतीय स्वाधीनता आंदोलन का इतिहास भाग 1 व 2
(2) सुमित सरकार – आधुनिक भारत
(3) पं.सुंदरलाल शर्मा – भारत में अंग्रेजी राज
(4) डॉ. आभा सक्सेना – इंडियन नेशनल मूवमेंट एंड द लिबरलस
(5) ए.आर. देसाई – भारतीय राष्ट्रवाद की सामाजिक पृष्ठभूमि
(6) शर्मा एवं शर्मा – भारतीय राष्ट्रीय आंदोलन एवं राजनैतिक विकास
(7) कौलेश्वर राय – फ्रीडम स्ट्रगल
(8) विपिन चन्द्र – भारतीय स्वतंत्रता संग्राम का इतिहास
(9) बीरकेश्वर प्रसाद सिंह – भारतीय राष्ट्रीय आंदोलन एवं संवैधानिक विकास
(10) रामलखन शुक्ला – आधुनिक भारत का इतिहास
(11) विनोद कुमार सक्सेना – द पार्टीशन ऑफ बंगाल
(12) के.पी. बहादुर – हिस्ट्री ऑफ फ्रीडम मूवमेंट इन इंडिया
(13) योगेन्द्र श्रीवास्तव – हिस्ट्री ऑफ फ्रीडम मूवमेंट 1857–1947
(14) यशपाल एवं ग्रोवर – आधुनिक भारत का इतिहास
(15) कौलेश्वर राय – आधुनिक भारत 1757–1950
(16) दामोदर धर्मानंद कौसंबी – भारतीय इतिहास का अध्ययन
(17) उषा ठक्कर एवं जयश्री मेहता – गांधी बोध
(18) माधुरी बोस – बोस बंधु और भारतीय स्वतंत्रता
(19) अजय गुडावर्थी – भारत मे राजनीतिक आंदोलनों का समकालीन इतिहास
(20) एम.आजाद – आजादी का कहानी
(21) ए.पी. सिंह – भारत में राष्ट्रवाद
(22) सुमीत सरकार – मॉर्डन टाइम्स
(23) रजनी कोठारी – पोलिटिक्स इन इंडिया
(24) एम.के. गांधी – हिन्द स्वराज
(25) किशोर अग्रवाल – बीसवीं शताब्दी का छत्तीसगढ़
(26) अरविंद शर्मा – छत्तीसगढ़ का इतिहास
(27) अशोक शुक्ला – छत्तीसगढ़ का राजनीतिक इतिहास
(28) भगवान सिंह वर्मा – छत्तीसगढ़ का इतिहास
(29) सुरेश चंद्र – छत्तीसगढ़ का समग्र इतिहास
(30) सुरेश चंद्र शुक्ला, – छत्तीसगढ़ की रियासतों का विलीनीकरण एवं अर्चना शुक्ला
(31.) आभा पाल एवं डिश्वर नाथ खुटे – बस्तर का राजनीतिक, सामाजिक एवं आर्थिक इतिहास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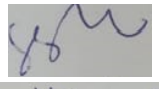
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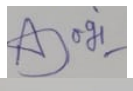

डॉ. अनुसुईया जोगी

B.A. /B. Sc. Part III
PAPER - I
REMOTE SENSING AND GIS
Max. Marks: 50

Unit I Basics of Remote Sensing: definition, history, and Scope; Electro-magnetic Radiation: Characteristics, Spectral regions and Bands; Interaction with earth surface features and atmosphere; Spectral Signature.

Unit II Types of Remote Sensing: Air borne and Space borne; Aerial photos: Types and Characteristics; Remote Sensing satellites: Platforms and sensors: active and passive, sensor characteristics: spatial resolution, spectral resolution, radiometric resolution, temporal resolution. Product.

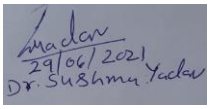
Unit III Visual and Digital image processing techniques; Remote Sensing application in resource mapping and environmental monitoring, remote sensing in India: development and Growth. Indian Satellites, Space Organizations and data products.

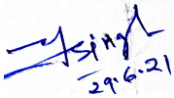
Unit IV Introduction of GIS: Definition of Geoinformatics, Scope and Importance of Geoinformatics, History of GIS, Components of GIS, Functions of GIS,GIS tasks-Input, Manipulation, Management, Query analysis, Visualization, Toposheets, Surveying, Aerial photographs ,Satellite data and images, Data types-Spatial and Non spatial.

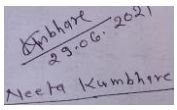
Unit V Data model and data analysis: Raster data and their characteristics, Vector data and their characteristics, Raster data analysis- grid cells or Pixels. Vector data analysis- Spatial data, Generation in Vector Format, Spatial and Non –Spatial data Management. Spatial information Technology

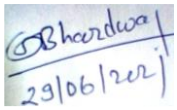
Books Recommended:

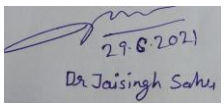
1. Bhatta, B. (2010): Remote Sensing and GIS, Oxford University Press, New Delhi.
2. Campbell, J.B. (2002): Introduction to Remote Sensing. 5th edition, Taylor and Francis, London
3. Curran, P.J. (1985): Principles of Remote Sensing, Longman, London
4. Kang-tsung Chang (2003) Geographic Information Systems, Tata McGraw Hill, New Delhi
5. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. 4th edition. John Wiley and Sons, New York
6. Lo Albert, C.P., and Young, K.W (2003) Concepts and Techniques of Geographical Information Systems, Prentice Hall of India Pvt. Ltd., New Delhi.
7. Nag Prithvish and Kudrat M. (1998): Digital Remote Sensing, Concept Publishing Company, New Delhi
8. Star J, and J. Estes, (1994), Geographic Information Systems: An Introduction, Prentice Hall, New Jersy.
9. Williams J. (1995): Geographic information from space, John Wiley and Sons, England,











B.A./B.Sc Part III

PAPER - II

GEOGRAPHY OF CHHATTISGARH

Max. Marks: 50

Unit I Physical Features : Geological Structure, Relief and Physiographic Regions, Drainage, Climate.

Unit II Natural Resources : Soils – Types, characteristics and their Distribution. Water Resources (Major Irrigation and Hydel Power Projects), Forests-types, Distribution, Conservation of Forest. Mineral Resources-iron-ore, Coal, Dolomite Lime stone, Bauxite, etc. Power Resources of Chhattisgarh.

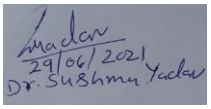
Unit III Agriculture and Populations – Agriculture: Cereals, Pulses and other crops. Population: Growth, Distribution, and Density; Tribal Populations; and Urban and Rural Population.

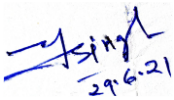
Unit IV Industries - Iron and Steel, Cement, Sugar, Aluminum; Industrial Regions of Chhattisgarh.

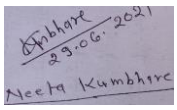
Unit V Trade and Transport, Tourism, Socio-Economic Development of Chhattisgarh.

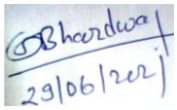
Books Recommended:

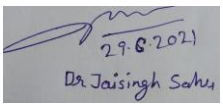
1. Jha, Vibhash Kumar and Saumya Naiyyar (2013) Chhattisgarh Samagra, Chhattisgarh Rajya Hindi Granth Akadmi, Raipur
2. Kumar, Pramila (2003): Chhattisgarh Ek Bhugolik Addhyayan. Madhya Pradesh Hindi Granth Akadmi, Bhopal
3. Nagesh Jitendra and at all (2014): Chhattisgarh Sandarbh 2014 Jansanmpark Vibhag, C.G. Govt., Raipur
4. Tiwari, Vijay Kumar ( ): Geography of Chhattisgarh, Himalya Publishing House, Pvt. Ltd
5. Tripathi, Kaushlendra and Pursottam Chandrakar (2001): Geography of Chhattisgarh, Shardaprakashan, Aazad Nagar , Bilaspur.
6. Verma ,L.N. (2017): Geography of Chhattisgarh, Madhya Pradesh Hindi Granth Akadmi, Bhopal











B.A./B.Sc Part III

PAPER - III

PRACTICAL GEOGRAPHY

Max. Marks: 50

SECTION A

MAP READINGS AND INTERPRETATION (M.M. 20)

Unit I Graphical Representation: Band graph, Climograph, Square root, Cube-root.

Unit II Topographical Sheets: Classification and numbering system (National and International), Interpretation of Topographical Sheets with respect to cultural and physical features.

Unit III Satellite Imageries: Describing the Marginal Information, Image interpretation: Visual Methods –Landuse /Landcover Mapping. Use and Application of GPS.

SECTION B

SURVEYING AND FIELD REPORT (M.M.20)

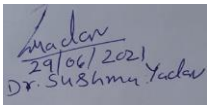
Unit IV Surveying: Plane Table Survey, Basic Principles of plane table surveying, Plane table survey including intersection and resection.

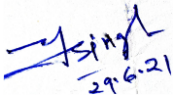
Unit V Field work and field report: physical, social and economic survey of a micro-region.

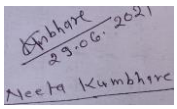
PRACTICAL RECORD AND VIVA VOCE (M.M.10)

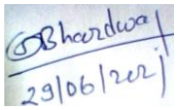
Books Recommended:

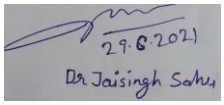
1. Archer, J.E. and Dalton, T.H. (1968): *Field Work in Geography*. William Clowes and Sons Ltd. London and Beccles.
2. Bolton, T. and Newbury, P.A. (1968): *Geography through Fieldwork*. Blandford Press, London.
3. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
4. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System(in Hindi), Sharda Pustak Bhawan, Allahabad
5. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
6. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
7. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
8. `
9. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
10. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
11. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.



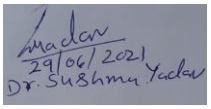


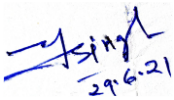


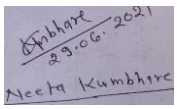


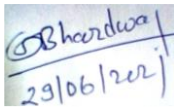


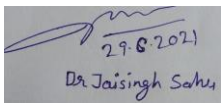
12. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.
13. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London
14. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
15. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. John Wiley and Sons, New York.
16. Monkhouse, F. J. (1985): Maps and Diagrams. Methuen, London.
17. Nag, P. (ed.) (1992): Thematic Cartography and Remote Sensing. Concept Publishing Company, New Delhi.
18. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
19. Rampal, K.K. (1999): Handbook of Aerial Photography and Interpretation. Concept Publishing. Company, New Delhi.
20. Raisz, E. (1962): Principles of Cartography, McGraw Hill, New York.
21. Robinson, A. H., Sale. R. D., Morrison, J. L. and Muehrcke, P. C. (1984): Elements of Cartography. 5th edition, John Wiley and Sons, Inc. New York.
22. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata
23. Sharma, J. P. (2001): *Prayogik Bhugol*., Rastogi Publication, Meerut 3rd. edition.
24. Singh, R.L. and Singh Rana P.B. (1993): *Elements of Practical Geography*. (Hindi and English editions). Kalyani Publishers, New Delhi.
25. Stoddard, Robert H. (1982): *Field Techniques and Research Methods in Geography*. Kendall/Hunt Pub. Dubuque IO.











बी.ए./बी.एस.सी. तृतीय वर्ष

प्रश्न पत्र–प्रथम

सुदूर संवेदन एवं भैगोलिक सूचना प्रणाली

अधिकतम अंकः 50

इकाई –1 : सुदूर संवेदन का अर्थ तथा आधारभूत संकल्पना : परिभाषा, इतिहास, एवं विषय क्षेत्र; विद्युत चुम्बकीय विकिरण : विशेषताएँ, वर्णक्रमीय (SPECTRAL) प्रदेश एवं बैण्ड; पृथ्वी के धरातल एवं वायुमण्डल के साथ विकिरण अर्जा की अन्योन्यक्रिया, वर्णक्रमीय (SPECTRAL)लक्षण ।

इकाई –2 : सुदूर संवेदन के प्रकार : वायु जनित एवं अंतरिक्ष जनित; हवाई छायाचित्र : प्रकार एवं विशेषताएँ; सुदूर संवेदन उपग्रह : प्लेटफार्म एवं संवेदक : सक्रिय एवं निष्क्रय, संवेदक की विशेषताएँ : स्थानिक विभेदन, वर्णक्रमीय (SPECTRAL) विभेदन, रेड़ियोमेट्रिक विभेदन, अल्पकालिक विभेदन, उत्पाद ।

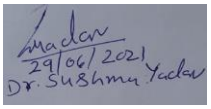
इकाई –3 : चाक्षुष एवं अंकीय बिम्ब प्रक्रियान्वयण तकनीक; संसाधन मानचित्रण एवं पर्यावरण नियंत्रण में सुदूर संवेदन अनुप्रयोग, भारत में सुदूर संवेदन; उद्दभव एवं विकास।

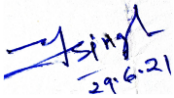
इकाई –4 : भौगोलिक सूचना प्रणाली का परिचय : भूसूचना की परिभाषा, भूसूचना का महत्व एवं विषय क्षेत्र, भौगोलिक सूचना प्रणाली का इतिहास, जी0 आई0 एस0 की संकल्पना, जी0 आई0 एस0 के कार्य – आंकड़ा प्रवेश, संचालन, परिचालन, प्रबंधन, त्रुटि संसूचन, विश्लेषण एवं प्रदर्शन, धरातलपत्रक, सर्वेक्षण, हवाई बिम्ब, उपग्रह आंकड़े एवं बिम्ब, आकड़ो के प्रकार धरातलीय एवं अधरातलीय या लाक्षाणिक ।

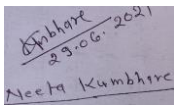
इकाई–5 : आंकड़ा मॉडल एवं आंकड़ा विश्लेषण : रॉस्टर आंकड़ा एवं उसकी विशेषताएँ, वेक्टर आंकड़ा एवं उसकी विशेषताएँ, रास्टार आंकड़ा विश्लेषण : ग्रिड सेल अथवा पिक्सल, विक्टर आंकड़ा विश्लेषण धरातलीय आकड़ा, विक्टर प्रारुप की रचना धरातलीय एवं अधरातलीय आंकड़ा प्रबंधन, धरातलीय सूचना तकनीक ।

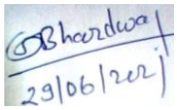
Books Recommended:

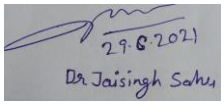
1. Bhatta, B. (2010): Remote Sensing and GIS, Oxford University Press, New Delhi.
2. Campbell, J.B. (2002): Introduction to Remote Sensing. 5th edition, Taylor and Francis, London
3. Curran, P.J. (1985): Principles of Remote Sensing, Longman, London
4. Kang-tsung Chang (2003) Geographic Information Systems, Tata McGraw Hill, New Delhi
5. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. 4th edition. John Wiley and Sons, New York
6. Lo Albert, C.P., and Young, K.W (2003) Concepts and Techniques of Geographical Information Systems, Prentice Hall of India Pvt. Ltd., New Delhi.
7. Nag Prithvish and Kudrat M. (1998): Digital Remote Sensing, Concept Publishing Company, New Delhi
8. Star J, and J. Estes, (1994), Geographic Information Systems: An Introduction, Prentice Hall, New Jersy.
9. Williams J. (1995): Geographic information from space, John Wiley and Sons, England,
10. चौनियाल, देवी दत्त (2004), सुदूर संवेदन एवं भौगोलिक सूचना प्रणाली, शारदा पुस्तक भवन, इलाहाबाद–2.











बी.ए./बी.एस.सी. तृतीय वर्ष
प्रश्न पत्र–द्वितीय
छत्तीसगढ़ का भूगोल

अधिकतम अंक : 50

इकाई –1. भौतिक स्वरूप भौमिकीय संरचना उच्चावच, भूआकृतिक प्रदेश, अपवाह, जलवायु ।

इकाई –2. प्राकृतिक संसाधन–मिट्टी, प्रकार, विशेषताएँ, वितरण, जलसंसाधनः प्रमुख सिंचाई और बहुउद्देशीय परियोजनांए, वन : प्रकार, वितरण, वनों का संरक्षण, खनिज संसाधन – लौह अयस्क, कोयला डोलोमाइट, चुना पत्थर और बाक्साइट छत्तीसगढ़ में शक्ति के संसाधन।

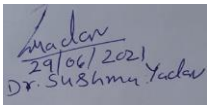
इकाई –3. कृषि– प्रमुख खाद्यान्न फसलें, दलहन एवं अन्य फसलें, जनसंख्या– वृद्धि, वितरण और घनत्व, जनजातिय जनसंख्या । ग्रामीण और नगरीय जनसंख्या ।

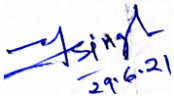
इकाई –4. उद्योग, लौह इस्पात उद्योग, सिमेंट चीनी, एल्युमिनीयम, छत्तीसगढ़ के औद्योगिक प्रदेश ।

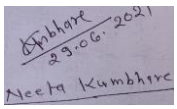
इकाई –5. व्यापार, परिवहन, पर्यटन, छत्तीगढ़ का सामाजिक आर्थिक विकास ।

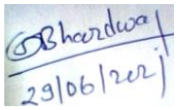
Books Recommended:

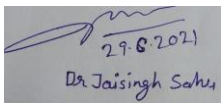
1. Jha, Vibhash Kumar and Saumya Naiyyar (2013) Chhattisgarh Samagra, Chhattisgarh Rajya Hindi Granth Akadmi, Raipur
2. Kumar, Pramila (2003): Chhattisgarh Ek Bhugolik Addhyayan. Madhya Pradesh Hindi Granth Akadmi, Bhopal
3. Nagesh Jitendra and at all (2014): Chhattisgarh Sandarbh 2014 Jansanmpark Vibhag, C.G. Govt., Raipur
4. Tiwari, Vijay Kumar ( ): Geography of Chhattisgarh, Himalya Publishing House, Pvt. Ltd
5. Tripathi, Kaushlendra and Pursottam Chandrakar (2001): Geography of Chhattisgarh, Shardaprakashan, Aazad Nagar , Bilaspur.
6. Verma ,L.N. (2017): Geography of Chhattisgarh, Madhya Pradesh Hindi Granth Akadmi, Bhopal











बी.ए./बी.एस.सी. तृतीय वर्ष
प्रश्न पत्र–तृतीय
प्रायोगिक भूगोल

अधिकतम अंक : 50

खण्ड (अ)

मानचित्र पठन एवं निर्वचन **20**

इकाई –1. बैन्ड ग्राफ, हीदर ग्राफ, क्लाइमोग्राफ, पवनारेख ।

इकाई –2. भारतीय स्थलाकृतिक मानचित्र की व्याख्या प्रकार, वर्गीकरण धरतलीय मानचित्र के प्रकार एवं विष्लेषण, राष्ट्रीय एवं अन्तराष्ट्रीय, भौतिक एवं सांस्कृतिक तत्वों के आधार पर विष्लेषण ।

इकाई –3. उपग्रह बिम्ब : प्रारम्भिक सूचनाओं की व्याख्या बिम्ब निर्वाचन : चाक्षुश विधि – भूमि उपयोग भूमि आच्छादन मानचित्रण, जी0 पी0 एस0 का उपयोग एवं अनुप्रयोग ।

खण्ड (ब)

सर्वोक्षण एवं क्षेत्रीय प्रतिवेदन **20**

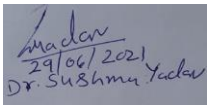
इकाई –4. सर्वेक्षण , समपटल सर्वेक्षण, प्रतिच्छेदन एवं स्थिति निर्धारण ।

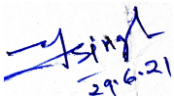
इकाई –5. भूगोल में क्षेत्रीय कार्य का महत्व किसी छोटे क्षेत्र का भौतिक सामाजिक आर्थिक सर्वेक्षण और रिपोर्ट तैयार करना ।

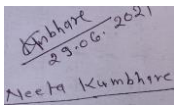
प्रायोगिक पुस्तिका और मौखिक परिक्षण परीक्षा **10**

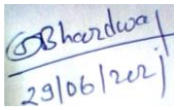
Books Recommended:

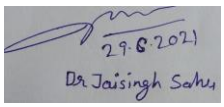
1. Archer, J.E. and Dalton, T.H. (1968): *Field Work in Geography*. William Clowes and Sons Ltd. London and Beccles.
2. Bolton, T. and Newbury, P.A. (1968): *Geography through Fieldwork*. Blandford Press, London.
3. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
4. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System(in Hindi), Sharda Pustak Bhawan, Allahabad
5. Cracknell, A. and Ladson, H. (1990): Remote Sensing Year Book. Taylor and Francis, London.
6. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
7. Davis, R.E. and Foote, F.S. (1953): Surveying, 4th edition, McGraw Hill Publication, New York
8. `
9. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
10. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
11. Gautam, N.C. and Raghavswamy, V. (2004). Land Use/ Land Cover and Management Practices in India. B.S. Publication., Hyderabad.
12. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.
13. Jones, P.A.(1968): Fieldwork in Geography, Longmans, Green and Company Ltd., First Publication, London



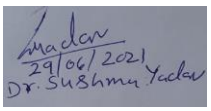


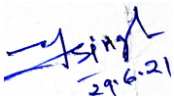


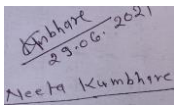


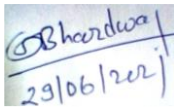


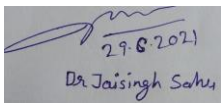
14. Kanetker, T.P. and Kulkarni, S.V.(1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
15. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. John Wiley and Sons, New York.
16. Monkhouse, F. J. (1985): Maps and Diagrams. Methuen, London.
17. Nag, P. (ed.) (1992): Thematic Cartography and Remote Sensing. Concept Publishing Company, New Delhi.
18. Natrajan, V. (1976): Advanced Surveying, B.I. Publications., Mumbai.
19. Rampal, K.K. (1999): Handbook of Aerial Photography and Interpretation. Concept Publishing. Company, New Delhi.
20. Raisz, E. (1962): Principles of Cartography, McGraw Hill, New York.
21. Robinson, A. H., Sale. R. D., Morrison, J. L. and Muehrcke, P. C. (1984): Elements of Cartography. 5th edition, John Wiley and Sons, Inc. New York.
22. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata
23. Sharma, J. P. (2001): *Prayogik Bhugol*., Rastogi Publication, Meerut 3rd. edition.
24. Singh, R.L. and Singh Rana P.B. (1993): *Elements of Practical Geography*. (Hindi and English editions). Kalyani Publishers, New Delhi.
25. Stoddard, Robert H. (1982): *Field Techniques and Research Methods in Geography*. Kendall/Hunt Pub. Dubuque IO.











B.A. –III[rd] Year

MUSIC

PAPER - I

THEORY OF INDIAN MUSIC-VOCAL/INSTRUMENTAL **M.M.:50**

SESSION – 2021-22

I. Definitions and Elementary Knowledge of the following terms : Shruti, Gram, Murchana, Jaati, Sadaj-Pancham Bhav, Sadaj-Madhyam Bhav, Sadjantar Bhav, Chatuh Sarana by acharya Bharat, Praman Shruti, Kaku Bhed, Jhala, Razakhani gat, Maseetkhani gat, Toda.

II. Introduction of Harmony and Melody Characteristics and comparative study of Harmony and Melody.

III. Methods of Placement of swars :

(a) Method of placing shudha and Vilkrit Swaras on Veena by Ahobal, Pt. Srinivas and Pt. V.N. Bhatkhande.

(b) Shruti Swar system of different granthakars (authors) Ancient, Medieval and Modern period.

IV. Evolution and Development of Swar Saptaka of western and Indian scales :

(a) Pythogorian Scale.

(b) Scale from Sadaj-Pancham Bhav,

(c) Scale from Sadaj-Madhyam Bhav,

(d) Equally tempered Scale

(e) Diatonic Scale

(f) Mean tempered Scale

(g) Concept of Acharya Bharat and Bilawal Thata.

(h) Chromatic Scale.

V. Definition and prime elements of Gharana and their history.

Gwalior, Agra, Kirana, Patiyala, Jaipur, Senia Gharana of Instrumental Music.

VI. Difinition of Gram and Gram Bhed -

Shadj Gram, Madhyam Gram, Gandhar Gram and their Swaras.

VII. Writing of Talas in Natation with Dugun and Chaugun layakaris in all the Talas prescribed in Ist and IInd Year.

16/03/2021

PAPER - II

THEORY OF MUSIC-VOCAL/INSTRUMENTAL **M.M.:50**

SESSION – 2020-21

1. Study of Theoretical details of Ragas prescribed for practical course and their comparative study.

2. Writing in notation of Bandish / Gat of prescribed Ragas.

3. Biographics and contributions of the musicians : Haddu - Hassu khan, Inayat Kan, Pandit Omkar Nath Thakur, Matang, Ramamatya, Srinivas, Lochan, Hridaya Narayan Dev, Somnath, Bhav Bhatta.

4. History of Indian Music: Medieval and Modern period; Analytical study of the styles, position and effects of granthkaras and eminent musician of medieval and modern Period.

5. Classical Music and Folk Music : Comparative study of Classical and Folk music. Intensive study of the Folks of Chhattisgarh.

6. Voice-Culture : Definition, Importance and utility of vioce-culture. Construcution of throat and production of sound. General Sicentific methods of voice-culture.

7. Guided listening to Radio and T.V. national Programmes of Indian classical Music and ability to write their critical appreciation.

8. Essay on topics related to music.

16/03/2021

PRACTICAL

VOCAL/INSTRUMENTAL

I. Study of Eight Ragas from the following:

Ramkali, Jaijaiwanti, Miyan ki Malhar, Pooriya, Basant, Bahar, Darbari Kanhada, Miyan ki Todi, Adana, Kalavati, Hansdhwani, Shuddhkalyan, Pooriyadhanashri, Marwa.

1. Two Vilambit Khayalas / Maseetkhani Gats in any of the above mentioned Ragas with Alap and Tanas / Todas.

   One Vilambit Khayalas / Maseethkhani / Gat choice Raga and one asked by the examiner.

   (5+5 = 10 marks)

3. Lakshan Geets, Sargams, Madhayalaya Khyals / Razakhani Gats with Tanas / Todas in All the eight Ragas. (5+5 = 10 marks)

4. Study of One Dhrupad and one dhamar with Dugun, Tigun Chaugun / study of Two Madhayata gats in other than Trital out of the Ragas precribed in the course. 8 marsk

5. Study of one Tarana, One Bhajan / One Dhun. 4 marks

6. Ability to demonstrate (orally by given Tali Khali on hand) Talas prescribed in 1st year And IInd year Matta Tala, Panjabi Trital, Ganesh Tal, Rudra Tala. 4 marks

SESSIONAL WORK

1. Keeping upto date practical and theory note Books. Attendence and activities in the class and college.
2. Ten descriptions of Music programmes of Radio, T.V. or personally attended.

16/03/2021

BOOK RECOMMENDED:

1. Kramik pustak Malika Part I, II, III, IV by Pt. V.N. Bhatkhande.
2. Sangeetanjali Part I, II, III, IV, V, VI by Pt. Omkarnath Thakur.
3. Raga Vigyan Part I, II, III, IV, V by Pt. V.N. Patvardhan.
4. Rag Bodh. B.R. Devdhar, Part I, II & III.
5. Sitar Vadan, S.G. Vyas.
6. Sangeet Visharad, Vasant
7. Sangeet Bodh - S.C. Paranjape
8. Sangeet Darshika - Navigopal Banerjee
9. Sangeet Shastra Darpan - Shanti Gowardhan Part I, II & III
10. Dawadhavi and Sangeet - Lalit Kishore singh
11. Shrimallakshay Sangeetam - Chatur Pandit.

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16/03/2021

Hemchand Yadav Vishwavidyalaya, Durg (C.G)

B. A. - III

P S Y C H O L O G Y

Paper	Name of the Paper	Max. Marks	Duration
I	Psychological Statistics	50	3 hrs.
II.	Human Development/ or Environmental Psychology	50	3 hrs.
III.	Practicum	50	4 Hrs.

PAPER - I

PSYCHOLOGICAL STATISTICS

M.M.: 50

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Statistics: Meaning and Application in Psychology; Nature of Score, Categorical and Continuous variables; Frequency Distribution; Graphic representation of data.

UNIT-2 Measures of Central Tendency: Mean, Median and Mode of grouped and ungrouped data, Measures of Variability: Range, Standard Deviation (S.D.), Quartile Deviation (Q.D.), Average Deviation (A.D.). Applications of the measures of Central Tendency and Variability.

UNIT-3 Nature and Characteristics of Normal Probability Curve (NPC): The concept of Skewness and Kurtosis; Correlation: Concept, Types and Methods- Rank Difference and Product Moment (in ungrouped data).

UNIT-4 Inferential Statistics: Concept of Null Hypothesis; Level of Significance; Type-I Error & Type-II Error, t-test (for uncorrelated data).

UNIT-5 Distribution-Free Statistics: Chi-square test, Median and Sign test. Applications of Computer in Psychological Statistics.

References

1. Siegel, S. (1994). Non Parametric Statistics. New York: McgrawHill.
2. Garret. Statistics in Psychology and Education. Times of India Publisher.
3. कपिल एच. क.। सांख्यिकी क मल तत्व।
4. गरट। मनाविज्ञान एव षिक्षा म सांख्यिकी।

10/3/21 10.3.21 10-03-21 10.03.21 10/3/21

B. A. - III

P S Y C H O L O G Y

PAPER- II (Optional)

(A) HUMAN DEVELOPMENT **M.M.:50**

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-I The Concept of Human Development; Theories of Human Development: Psycho-anaytical and Maslow's (Humanistic); Determinants of Human Development: Biological, Social, and Cultural; Approaches to study Human Development: Longitudinal and Cross-sectional.

UNIT-II Socialization: Role of Family, Peers and School; Media and Socialization; Cognitive Development: Theoretical Perspectives- Piaget's, Information Processing, Vygotsky's.

UNIT-III Self and Identity: Emergence of Self; Development of Personal Identity; Identity Crises; Physical and Sexual Development; Sequential Development of Emotions.

UNIT-IV Development of Morality and Self-control; Development of Gender Differences and Gender Roles; Role of Marriage, Family and Occupation in Human Development.

UNIT-V Problems of Aging: Cognitive, Conative, and Affective; Developmental Disabilities.

References

1. Berk L.E. (1989) Child Development. Boston: Allyn and Bacon.
2. Santrock, J.W. (1999). Lifespan Development. New York: McGraw-Hill.
3. Hurlock, E.B. (1997). Developmental Psychology: A Life-span Approach.
4. शाह, गोवर्धन विकासात्मक मनोविज्ञान।

10/3/21 10.3.21 10-03-21 10.03.21 10/3/21

B. A. - III

P S Y C H O L O G Y

PAPER- II (Optional)

(B) ENVIRONMENTAL PSYCHOLOGY **M.M.:50**

Note: This paper consists of five units. From each unit a minimum of two questions would be set and the candidates would be required to attempt one from the each unit.

UNIT-1 Evaluating Environmental Ethics from Values about nature in the ancient Indian systems; Earth as a Living System; Psychological Approaches to the Environment: Eco Cultural Psychology (Berry), Bio-social Psychology (Dawson), Ecological Psychology (Berkar), and Person Environment Transactions (Sokols, Itlelson etc.)

UNIT-2 Effects of Environment on Behavior: Noise Pollution, Chemical Pollution, Crowding and Personal Space; Effect of Behavior on Environment: Perception, Preferences and Awareness of Environment.

UNIT-3 Human Nature and Environmental Problems; Pro-social and pro environment Behaviors; Eco-systems and their components; Demography: Mortality and Fertility; Resource Use: Common Property Resources; Sustainable Development; Ecology: Acculturation and Psychological Adaptation.

UNIT-4 Methods: Naturalistic Observation and Field Surveys; Environmental Assessment: Naturalistic Observation and Field Surveys; Socio-psychological Dimensions of Environments Impact; Environmental Deprivation: Nature and Consequences; Creating Environmental Awareness: Social Movements: Chipko, Tehri, and Narmada Bachao.

UNIT-5 Applications of Psychology in Man Environment Fit: Education- Classroom Environment, Industry- Industrial/ Organisational Effectiveness, Health- Physical, Mental and Spiritual, Social- Communal harmony and National integration.

References

1. Goldsmith, E. (1991). The Way: The Ecological World. Boston: Shambhala.
2. Jain, U. (1987). The Psychological Consequences of Crowding. New Delhi: Sage.
3. Mishra, R.C., Sinha, D & Berry, J.W. (1996). Ecology, Community and Life style. New Delhi.

B. A. - III

P S Y C H O L O G Y

PAPER- III

PRACTICUM **M.M.:50**

Note: This paper consists of two parts:

Part-A

(a) Comprises of Laboratory E**xperiments**.
(b) Comprises of Psychological **Testing** and understanding of self and others.

(a) **Experiments** (Any five of the following):-

1. Bilateral Transfer of Training.
2. Measurement of Illusion.
3. Habit Interference.
4. Effect of Need priority on Selection of advertising material.
5. Effect of Mental Fatigue on Performance.
6. Reaction Time.
7. Effect of Frustration on Learning.
8. Depth Perception.

(b) **Psychological Tests** (Any four of the following):-

1. Level of Aspiration.
2. Need for Guidance.
3. Maturity Scale.
4. Attitude Scale.
5. Classroom Environment Scale.
6. Mental Health.
7. Family Environment Test
8. Test of Moral Values.

Part- B

The candidate will be allotted a topic of the project by the departmental committee. He/she is required to carry out a small scale project based on a small sample. He/she is required to complete the project and submit its report in 15-20 pages, covering all the major steps of scientific enquiry under the supervision of a departmental teacher. This will be the part of practical work. The suggested areas for the project work are as under Mental Health, Sibling Rivarly, Deprivation, Identity Crises, Drug Abuse, Aging, Media effect, Woman Employment, Job Satisfaction, Stress, Stress Management, and Problems of Adolescents etc.

Distribution of Marks

Conduction of Experiment	-	10 marks
Administration of test	-	10 marks
Evaluation of Project Report and Practical record	-	10 marks
Viva - Voce	-	10 marks

10/3/21 10.3.21 10-03-21 10.03.21 10/3/21

B.A./B.Sc. – Third Year

Session: 2021-22

Name of the Subject	:-	Anthropology
Paper	: -	First
Name of the Paper	:-	"FUNDAMENTALS OF HUMAN GENETICS, HUMAN GROWTH AND NUTRITION"

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT-I	Human Genetics: History, aims, scope and its application to human society Cell Division: Mitosis and Meiosis; Mendelism Chromosomes: Normal and Abnormal chromosomes. Concept of Genes, DNA & RNA. Types of Inheritance: Autosomal (Dominant and Recessive) & Sex linked Inheritance.
UNIT-II	Human Growth: Definition and scope of Human growth, Methods of studying human growth and development, Ageing
UNIT-III	Types of twins and their importance in genetic investigation. Inheritance of ABO Blood groups, P.T.C., Colour blindness and dermatoglyphics. Genetic Counselling, Eugenics. Population Genetics: Hardy- Weinberg Law
UNIT-IV	Nutrition: Nutritional requirement for normal growth. Common Nutritional disorders (Protein, Fat, Carbohydrate, Minerals and Vitamins).
UNIT-V	Ecology: Definition and Scope, Varieties of human ecosystems Environmental Pollution Biological Demography: Definition, nature and scope Demographic Profiles: Fertility, Mortality, Morbidity.

B.A./B.Sc. – Third Year

Session: 2021-22

Name of the Subject	:-	Anthropology
Paper	: -	Second
Name of the Paper	:-	THEORIES IN SOCIAL-CULTURAL ANTHROPOLOGY

Total Marks: 50 Pass Marks: 17

Syllabus

UNIT-I The contributions made by the following Anthropologists to Social-Cultural Anthropology.
(I) E. Durkheim, (II) F. Boas. (Ill) R. Redfield, (IV) A. L. Kroeber. (V) S.C. Dube, (VI) M.N. Shrinivas, (VII) L.P. Vidyarthi,

UNIT-II Evolution: Biological and cultural evolution
Evolutionism: Classical Evolutionism (E.B. Tylor & L.H. Morgan); Neo – Evolutionism (Leslie White & Gordon Childe)
Diffusionism: British, German-Austrian (Kulture kreise) and American diffusionism (Cultural traits, Culture Complex, Culture Area, Culture focus)

UNIT-III Function and structure:
Functionalism (Malinowski)
Structure Functionalism (Radcliff Brown)
Structuralism (Levi - Strauss).

UNIT-IV Personality and Culture:
Basic personality and Model Personality (Cora-du-bois, Abraham Kardinar)
Culture pattern: Configurationalism (Ruth Benedict)
Anthropological study of National character
Contribution of Margret Mead in study of National Character

UNIT-V Field work tradition in Anthropology
Major tools of Research: Schedule, Questionnaire, observation, interview, case study, Geneological Study
Types of Anthropological Methods: Historical Method, Comparative Method and Functional Method.

B.A. /B.Sc. – Third Year

Session : 2021-22

Name of the Subject :- Anthropology

Paper No. : - Practical

Name of the Paper :- SOMATOSCOPY, SOMATOMETRY AND GENETICAL TRAITS

Total Marks: 50 Pass Marks: 17

Syllabus

OBJECTIVES:
The objective of this practical course is to introduce the student about the tools and Method, analysis & statistical methods used in Human Biology. Laboratory procedures in blood grouping and dermatoglyphics would give confidence in dealing with all the applied dimensions.

Part-1 Somatoscopic Observation

1. Skin colour
2. Eye
3. Nose
4. Hair
5. Lips

Part –2 Somatometry:

(a) Measurements on body:

1. Height vertex,
2. Height tragus,
3. Suprasternale height,
4. Biacromial Breadth,
5. Bi-illiocristal breadth,
6. Tibiale height,
7. Upper extremity length,
8. Sitting height,
9. Height dactylion,
10. Body weight.

(b) Head and Face Measurement:

1. Morphological upper facial length.
2. Physiognomic upper facial length.
3. Morphological facial length.
4. Bizygomatic breadth.
5. Max head length.
6. Max head breadth.
7. Nasal length.
8. Nasal breadth.

(c) Somatometry indices:

1. Cephalic index.
2. Nasal index.
3. Facial index.

Part- 3 Genetic Traits:

ABO blood group. Colour blindness, PTC taste sensitivity, Dermatoglyphics: Methods of taking finger and palm prints and their analysis

Part-4 Statistics: Mean, Median, Standard deviation, X^2 test.

भाषाविज्ञान
प्रश्न पत्र प्रथम
भाषा का सामाजिक परिप्रेक्ष्प
(पेपर कोड – 0238) **कुल अंक : 75**

इकाई –1 भोलाराम तिवारी व्यक्ति , भाषा एवं समाज – भाषा–ज्ञान–सहजात एवं सामाजिक संदर्भ, भाषा–संप्रेषण, साधना के रूप में, साण्स के स्न में, भाषा एवं अस्मिता, भाषा के माध्यम से सामाजिक संरचना।

इकाई –2 भाषा का सामाजिक संदर्भ – मानक भाषा, परिनिष्ठित भाषा, पिजिन एवं क्रियोल, क्षेत्रीय भाषा, संपर्क–भाषा, डिग्लोसिया (भाषा–द्वैत)।

इकाई– 3 भाषा–भेद–सामाजिक एवं क्षेत्रीय भेद, सामाजिक एवं भाषिक भेद में संबंध, समाजभाषिय परिवर्त।

इकाई –4 भाषा–नियोजन–उद्देश्य, राष्ट्रीय नियोजन के अंग के रूप में भाषा–नियोजन, भाषा–मानकीकरण।

इकाई–5 द्विभाषिता एवं बहुभाषिकता – कोड–मिश्रण एवं कोड–परिवर्तन।

निर्धारित पुस्तकें :

1. हिन्दी का सामाजिक संदर्भ – रामनाथ सहाय एवं अन्य (सं.), केन्द्रीय हिन्दी संस्था, आगरा
2. हिन्दी भाषा का समाज शास्त्र – रवीन्द्रनाथ श्रीवास्तव
3. हिन्दी भाषा का सामाजिक सरंचना – डॉ. भोलाराम तिवारी (सं.)
4. हिन्दी का साामाजिक भूमिका – डॉ. भोलाराम तिवारी एवं मुकुल प्रियदर्शिनी
5. Sociliryuistics : R.s. Hudson, Cambridge University Press Cambridge
6. An Introduction to Sociolinguistics : R. Warddhangh, Prenguin, Hurm.

द्वितीय प्रश्नपत्र
भाषा एवं साहित्य
(पेपर कोड –0239) **कुल अंक : 75**

इकाई –1 भाषा एवं साहित्य का संबंध – मानक भाषा और काव्य भाषा, सामान्य भाषा और काव्य भाषा, भावनात्मक भाषा एवं वैज्ञानिक तथा तकनीकि भाषा, भाषा की सर्जनात्मकता, भाषा का सौंदर्यशास्त्र काव्यशास्त्र एवं साहित्यिक समीक्षा।

इकाई–2 शैली एवं प्रकार्य – शैली विज्ञान एवं भाषाविज्ञान का संबंध, शैली की उपयोगिता, शैली–भेद एवं संदर्भ–भेद, भाषा प्रयोग एवं संदर्भ।

इकाई –3 प्राक्ति –परिभाषा एवं विभिन्न आधारों पा प्राक्ति के प्रकार, चयन विचलन, समांतरता, प्रतीकात्मकता एवं बिम्बात्मकता ।

इकाई –4 भाषा–शिक्षण – सिद्धांत एवं महत्व, भाषा–शिक्षण की विधियां, मातृभाषा शिक्षण, अन्य भाषा–शिक्षण, अन्य भाषा के रूप में हिन्दी का शिक्षण, भाषा–शिक्षण में व्याघात, संस्कृति का प्रभावं।

इकाई –5 साहित्य–शिक्षण – साहित्य–शिक्षण : उद्देश्य, विधियां, एवं सिद्धांत, कविता–शिक्षण, नाट्य–शिक्षण, कहानी–शिक्षणका परिचय, साहित्य–शिक्षण में दृश्य–श्रण्य उपकरणों का उपयोग एवं महत्व।

निर्धारित पुस्तकें–

1. शैलीहवज्ञान –भोलानाथ तिवारी
2. प्रांरभिक शैलीविज्ञान – डॉ. चित्तरंजनकर
3. शैलीविज्ञान – सुरेश कुमार
4. हिन्दी भाषा–शिक्षण – रविन्द्रनाथ श्रीवास्तव एवं अन्य
5. भाषाशिक्षण – मनोरमा गुप्त

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2021-22
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A./B.Sc. –III
Subject: Statistics
Paper-I
Applied Statistics

Unit I

Indian Applied Statistics System: Present official statistical System in India, Methods of collection of Official Statistics, their reliability and limitations, and the principal publications containing such statistics on the topics-population agriculture, industry, trade, price, labour and employment, transport and communications, Banking and Finance.

Unit II

Demographic Methods: **S**ources of demographic data: Census, register and-hoc surveys, hospital records, demographic profiles of the Indian Census, Measurement of mortality, and life table,: crude death rate, age specific death rates, infant mortality rates, infant death rate, death rate by cause, standardized death rate, direct & indirect method of standardized death rate, Complete life tables- its main features,mortality rate and probability of dying , uses of survival tables

Measurement of fertility,: crude birth rate,, general fertility rate, age specific birth rate, total fertility rate, gross reproduction rate, net reproduction rate.

Unit III

Economic Statistics: Index number- definition, application of index numbers. Price relatives and quantity or volume relatives. Link and chain relatives, problems involved in computation of index numbers, uses of averages, simple aggregative and weighted average methods, Laspeyre's, Paasche's, Marchal-edgeworth's and Fisher's index numbers, Time and Factor reversal tests. Chain base index number, Consumer price –index numbers.

Unit IV

Static laws of demand and supply, Price elasticity of demand, Forms of demand functions, Engel's curves, Income elasticity of demand.

Analysis of income and allied distributions-Pareto distribution, graphical test, fitting of Pareto's Law, log normal distributions and its properties, Lorenz curve and estimation of elasticity from time series data, Gini's coefficient.

Unit V

Time series analysis- economic time series, different components, illustrations, additive and multiplicative models, determination of trend, growth curves, analysis of seasonal fluctuations, construction of seasonal indices.

REFERENCES

1. Croxton F.E. and Cowden D.J. (1969): Applied General Statistics, Prentice Hall of India.

2.Chatfield, C.(1980): The Analysis of Time Series-An Introduction ,Second Edition Chapman and Hall.

3.Goon A.M.;Gupta,M.K. and Dasgupta ,B(1986):Fundamentals of Statistics, Volume-Two, World Press,Calcutta

4. Guide to Current Indian Official Statistics: Central Statistical Organization, Govt. of India, New Delhi.

5. Mukhopadhyay ,P.(1999) : Applied Statistics, New Central Book agency Pvt. Ltd., Calcutta.

6. Srivastava O.S. (1983): A Text Book of Demography, Vikas Publishing.

ADDITIONAL REFERENCES

1. Cox,P.R.(1970):Demography,Cambridge University Press.

2. Pressat R. (1978): Statistical Demography, Methuen and Co. Ltd.

Paper-II
Statistical Quality Control and Computational Techniques

Unit I
Importance of statistical methods in industrial research and practice, specification of items and lot qualities corresponding to visual gauging, count and measurements, types of inspection, determination of tolerance limits. General theory of control charts, causes of variation in quality, control limits, sub-grouping, summary of out of control criteria. Charts for attributes, np chart, p-chart, c-chart, u- chart. Charts for variables, $\bar{X}$ and R charts, design of $\bar{X}$ and R charts, versues p chrts, process cabability of studies.

Unit II
Principle of acceptance sampling-problem of lot acceptance, stipulation of good and bad lots, Producer's and consumers risks, single and double sampling plans for all attributes , their OC functions, concepts of AQL, LTPD, AOQL, Average amount of inspection and ASN function, rectifying inspection plans, sampling inspection plans for variables, Indian Standard Tables Part-I(including applications), IS 2500 Part I.

Unit III
Computational Techniques: Difference tables and methods of interpolation: Newton's forward and backward interpolation formula, Lagranges method of interpolation, divided difference interpolation formula. Numerical differentiation and integration. Trapezoidal, Simpson's one – third formulae, iterative solutions of non-linear equations.

Unit IV
Linear Programming: Elementary theory of convex sets, definition of general linear programming problems (LPP), formulation problems of LPP, examples of LPP. Problems occurring in various fields, Graphical and Simplex methods of solving an LPP, artificial variables, duality of LPP, Transportation Problem (non-degenarate and balanced cases only), Assignment Problems.

Unit V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1.Brownless K.A. (1960): Statistical Theory and Methodology in Science and Engineering, John Wiley and Sons.
2.Grant E.L. (1964): Statistical Quality Control, McGraw Hill.
3. Ducan A.J. (1974): Quality Control and Industrial Statistics, Traporewala and Sons.
4. Gauss S.I. (1975) : Linear Programming Methods and Applications, McGraw Hill.
5. Montgomery, D.C. (1985): Introduction to Statistical Quality Control; Wiley.
6. Rajaraman, V. (1981) : Computer Oriented Numerical Methods, Prentice Hall.
7.Shanti Narayan (1993). Mathematical Analysis, S. Chand and Co.

8. Sastry S.S. (1987): Introductory Methods of Numerical Analysis, Prentice Hall
9. Taha H.A.(1982) Operational research :An Introduction ;Macmillan

ADDITIONAL REFERENCES:

1. Biswas Suddhendu (1996): Statistics of Quality Control,Sampling Inspection and Reliability,new Age international Publishers,New delhi.
2. Browker H.A. and Liberman G.T. (1962): Engineering Statistics, Prentece Hall.
3.Despande J.V. (1981). Text Book of Mathematical Analysis, Tata McGraw Hill.

4. Crowden, D.J. (1960): statistical Methods in Quality Control, Asia publishing Society
5. Garwin W.W. (1960): Introduction to Linear Programming, McGraw Hill.
6. Kanti Swarup,Gupta,P.K. and Singh,M.M. (1985):Operations Research;Sultan chand & sons.

7. Mahajan M. (2001) Statistical Quality Control, Dhanpat Rai & Co. (P. Ltd.).
8. Rao S.S. (1984) : Optimization Theory and Applications, Wiley Eastern.
9.Somasundaram, D. and Choudhari, B.(1996). A First Course in Mathematical Analysis, Narosa Publishing House.
10.Wagner H.M. (1973) Principle of O.R. with Applications to Managerial Decisions; Prentice Hall.
11.Wetherill ,G.B (1977) Sampling Inspection and Quality Control; Halsted Press.

Paper III:

Practical : Practical Based on Paper I & II

1. Computing measures of mortality and fertility, construction of life tables, graduation of mortality rates by Gompertz curve, fitting of Logistic curve.
2. Construction of index numbers by Laspeyre's, Paasche's, Marshell,-Edgeworth and Fisher method.
3. Determination of trend in a time series, construction of seasonal indices.
4. Fitting of Pareto curve to income data, Lorenz curve of concentration, Estimation of price elasticity of demand from time series data.
5. Drawing of $\bar{X}$ -R, np, p anf c –charts. Drawing of OC curve for single and double sampling plans.
6. Construction of difference tables. Use of Newton's, Lgrange's methods of interpolation and divided difference formulae, numerical evaluation of integrals using Trapezoidal and Simpon's one-third formulae, solution to non-linear equation by Newton-Raphson iterative method.
7. Formulation of LPPs and their duals. Solving LPPs by graphical and simplex methods, transportation and assignment problems.

MATHEMATICS

There shall be three theory papers. Two compulsory and one optional. Each paper carrying 50 marks is divided into five units and each unit carry equal marks.

B.A./B.SC. Part-III

PAPER - I
ANALYSIS

METRIC SPACES

UNIT-I Definition and examples of metric spaces. Neighbourhoods, Limit points, Interior points, Open and Closed sets, Closure and interior. Boundary points, Sub-space of a metric space. Cauchy sequences, Completeness, Cantor's intersection theorem. Contraction principle, construction of real numbers as the completion of the incomplete metric space of rationals. Real numbers as a complete ordered field.

UNIT-II Dense subsets. Baire Category theorem. Separable, second countable and first countable spaces. Continuous functions. Extension theorem. Uniform continuity, isometry and homeomorphism. Equivalent metrics. Compactness, sequential compactness. Totally bounded spaces. Finite intersection property. Continuous functions and Compact sets, Connectedness, Components, Continuous functions and Connected sets.

COMPLEX ANALYSIS

UNIT-III Complex numbers as ordered pairs. Geometrical representation of complex numbers. Stereographic projection. Continuity and differentiability of complex functions. Analytic functions. Cauchy-Riemann equations. Harmonic functions. Elementary functions. Mapping by elementary functions. Mobius transformations. Fixed points, Cross ratio. Inverse points and critical mappings. Conformal mappings.

REAL ANALYSIS

UNIT-IV Series of arbitrary terms. Convergence, divergence and oscillation. Abel's and Dirichlet's test. Multiplication of series. Double series. Partial derivation and differentiability of real-valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Fourier series. Fourier expansion of piecewise monotonic functions.

UNIT-V Riemann integral. Intergrability of continuous and monotonic functions. The fundamental theorem of integral calculus. Mean value theorems of integral calculus. Improper integrals and their convergence. Comparison tests. Abel's and Dirichlet' tests. Frullani's integral. Integral as a function of a parameter. Continuity, derivability and integrability of an integral of a function of a parameter.

REFERENCES :

1. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
2. R.R. Goldberg, Real Analysis, Oxford & IBH publishing Co., New Delhi, 1970.
3. S. Lang, Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. D. Somasundaram and B. Choudhary, A First Coarse in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. Shanti Narayan, A Course of Mathematical Analysis, S. Chand & Co. New Delhi.
6. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
7. R.V. Churchill and J.W. Brown, Complex Variables and Applications, 5th Edition, McGraw- Hill, NewYork, 1990.
8. Mark J. Ablowitz and A.S. Fokas, Complex Variables : Introduction and Applications, Cambridge University Press, South Asian Edition, 1998.
9. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
10. E.T. Copson, Metric Spaces, Cambridge University Press, 1968.
11. P.K. Jain and K. Ahmad, Metric Spaces, Narosa Publishing House, New Delhi, 1996.
12. G.F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 1963.

Dr. Shabnam Khan. (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

B.A./B.SC. Part-III

PART - II
ABSTRACT ALGEBRA

UNIT-I Group- Automorphisms, inner automorphism. Automorphism of groups and their computations, Conjugacy relation, Normaliser, Counting principle and the class equation of a finite group. Center for Group of prime-order, Abelianizing of a group and its universal property. Sylow's theorems, Sylow subgroup, Structure theorem for finite Abelian groups.

UNIT-II Ring theory-Ring homomorphism. Ideals and quotient rings. Field of quotients of an integral domain, Euclidean rings, polynomial rings, Polynomials over the rational field. The Eisenstien criterion, polynomial rings over commutative rings, Unique factorization domain. R unique factorisation domain implies so is $R[x_1, x_2 ..... x_n]$. Modules, Submodules, Quotient modules, Homomorphism and Isomorphism theorems.

UNIT-III Definition and examples of vector spaces. Subspaces. Sum and direct sum of subspaces. Linear span, Linear dependence, independence and their basic properties. Basis. Finite dimensional vector spaces. Existence theorem for bases. Invariance of the number of elements of a basis set. Dimension. Existence of complementary subspace of a finite dimensional vector space. Dimension of sums of subspaces. Quotient space and its dimension.

UNIT-IV Linear transformations and their representation as matrices. The Algebra of linear transformations. The rank nullity theorem. Change of basis. Dual space. Bidual space and natural isomorphism. Adjoint of a linear transformation. Eigenvalues and eigenvectors of a linear transformation. Diagonalisation. Annihilator of a subspace. Bilinear, Quadratic and Hermitian forms.

UNIT-V Inner Product Spaces-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements. Orthonormal sets and bases. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.

REFERENCES :

1. I.N. Herstein, Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975.
2. N. Jacobson, Basic Algebra, Vols. I & II. W.H. Freeman, 1980 (also published by Hindustan Publishing Company).
3. Shanti Narayan, A Text Book of Modern Abstract Algebra, S.Chand & Co. New Delhi.
4. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
5. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal, Basic Abstract Algebra (2"" Edition) Cambridge University Press, Indian Edition, 1997.
6. K. Hoffman and R. Kunze, Linear Algebra, (2nd Edition), Prentice Hall. Englewood Cliffs, New Jersey, 1971.
7. S.K. Jain, A. Gunawardena and P.B. Bhattacharya, Basic Linear Algebra with MATLAB. Key College Publishing (Springer-Verlag) 2001.
8. S. Kumaresan, Linear Algebra, A Geometric Approach, Prentice-Hall of India, 2000.
9. Vivek Sahai and Vikas Bist, Algebra, Norosa Publishing House, 1997.
10. I.S. Luther and I.B.S.Passi, Algebra, Vol. I-Groups, Vol. II-Rings. Narosa Publishing House (Vol. I-1996, Vol. II-1999)
11. D.S. Malik, J.N. Mordeson, and M.K. Sen, Fundamentals of Abstract Algebra, McGraw- Hill International Edition, 1997.

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B.A./B.SC. Part-III

PAPER - III - (OPTIONAL)

(I) PRINCIPLES OF COMPUTER SCIENCE

UNIT-I **Data Storage** - Storage of bits. Main Memory. Mass Storage. Coding Information of Storage. The Binary System. Storing integers, storing fractions, communication errors.
Data Manipulation - The Central Processing Unit. The Stored-Program Concept. Programme Execution. Other Architectures. Arithmetic/Logic Instructions. Computer- Peripheral Communication.

UNIT-II **Operating System and Networks** - The Evolution of Operating System. Operating System Architecture. Coordinating the Machine's Activities. Handling Competition Among Process. Networks. Networks Protocol.
Software Engineering - The Software Engineering Discipline. The Software Life Cycle. Modularity. Development Tools and Techniques. Documentation. Software Ownership and Liability.

UNIT-III **Algorithms** - The Concept of an Algorithm, Algorithm Representation. Algorithm Discovery. Iterative Structures. Recursive Structures. Efficiency and Correctness. (Algorithms to be implemented in C++).
Programming Languages - Historical Perspective. Traditional Programming Concepts, Program Units. Language Implementation. Parallel Computing. Declarative Computing.

UNIT-IV **Data Structures** - Arrays. Lists. Stacks. Queues. Trees. Customised Data Types. Object Oriented Programming.
File Structure - Sequential Files. Text Files. Indexed Files. Hashed Files. The Role of the Operating System.
Database Structure - General Issues. The Layered Approach to Database Implementation. The Relational Model. Object-Oriented Database. Maintaining Database Integrity. E-R models

UNIT-V **Artifical Intelligence** - Some Philosophical Issues. Image Analysis. Reasoning, Control System Activities. Using Heuristics. Artificial Neural Networks. Application of Artificial Intelligence.
Theory of Computation - Turning Machines. Computable functions. A Non computable Function. Complexity and its Measures. Problem Classification.

REFERENCES :

1. J. Glen Brookshear, Computer Science : An Overview, Addition -Wesley.
2. Stanley B. Lippman, Josee Lojoie, C++ Primer (3rd Edition), Addison-Wesley.

Padmavali Dr. Shabnam Khan. Neelam Sharma (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

B.A./B.SC. Part-III

PAPER - III - (OPTIONAL)

(II) DISCRETE MATHEMATICS

UNIT-I **Sets and Propositions -** Cardinality. Mathematical Induction, Principle of inclusion and exclusion. **Computability and Formal Languages -** Ordered Sets. Languages. Phrase Structure Grammars. Types of Grammars and Languages. Permutations. Combinations and Discrete Probability.

UNIT-II **Relations and Functions -** Binary Relations, Equivalence Relations and Partitions. Partial Order Relations and Lattices. Chains and Antichains. Pigeon Hole Principle.

Graphs and Planar Graphs - Basic Terminology. Multigraphs. Weighted Graphs. Paths and Circuits. Shortest Paths. Eulerian Paths and Circuits. Travelling Salesman Problem. Planner Graphs. Trees.

UNIT-III **Finite State Machines -** Equivalent Machines. Finite State Machines as Language Recognizers. **Analysis of Algorithms -** Time Complexity. Complexity of Problems. Discrete Numeric Functions and Generating Functions.

UNIT-IV **Recurrence Relations and Recursive Algorithms -** Linear Recurrence Relations with constant coefficients. Homogeneous Solutions. Particular Solution. Total Solution. Solution by the Method of Generating Functions. Brief review of Groups and Rings.

UNIT-V **Boolean Algebras -** Lattices and Algebraic Structures. Duality, Distributive and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Expressions. Prepositional Calculus. Design and Implementation of Digital Networks. Switching Circuits.

REFERENCES :

1. C.L. Liu, Elements of Discrete Mathematics, (Second Edition), McGraw Hill, International Edition, Computer Science Series, 1986

Padmavali Dr. Shabnam Khan. Neelam Sharma (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

B.A./B.SC. Part-III

PAPER - III - (OPTIONAL)

(III) PROGRAMMING IN C AND NUMERICAL ANALYSIS

(Theory & Practical)

Theory component will have maximum marks 30.

Practical component will have maximum marks 20.

UNIT-I Programmer's model of a computer. Algorithms. Flow Charts. Data Types. Arithmetic and input/output instructions. Decisions control structures. Decision statements. Logical and Conditional operators. Loop. Case control structures. Functions. Recursions. Preprocessors. Arrays. Puppetting of strings. Structures. Pointers. File formatting.

Numerical Analysis

UNIT-II **Solution of Equations:** Bisection, Secant, Regula Falsi, Newton's Method, Roots of Polynomials. **Interpolation:** Lagrange and Hermite Interpolation, Divided Differences, Difference Schemes, Interpolation Formulas using Differences. Numerical Differentiation. Numerical Quadrature: Newton-Cote's Formulas. Gauss Quadrature Formulas, Chebychev's Formulas.

UNIT-III **Linear Equations:** Direct Methods for Solving Systems of Linear Equations (Guass Elimination, LU Decomposition, Cholesky Decomposition), Iterative Methods (Jacobi, GaussSeidel, Relaxation Methods).

The Algebraic Eigenvalue problem: Jacobi's Method, Givens' Method, Householder's Method, Power Method, QR Method, Lanczos' Method.

UNIT-IV **Ordinary Differential Equations:** Euler Method, Single-step Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method, Methods Based on Numerical Integration, Methods Based on Numerical Differentiation, Boundary Value Problems, Eigenvalue Problems.

Approximation: Different Types of Approximation, Least Square Polynomial Approximation, Polynomial Approximation using Orthogonal Polynomials, Approximation with Trigonometric Functions, Exponential Functions, Chebychev Polynomials, Rational Functions.

Monte Carlo Methods

Unit-V Random number generation, congruential generators, statistical tests of pseudo-random numbers. Random variate generation, inverse transform method, composition method, acceptance rejection method, generation of exponential, normal variates, binomial and Poisson variates.

Monte Carlo integration, hit or miss Monte Carlo integration, Monte Carlo integration for improper integrals, error analysis for Monte Carlo integration.

REFERENCES :

1. Henry Mullish and Herbert L. Cooper, Spirit of C: An Introduction to Modern Programming, Jaico Publishers, Bombay.
2. B.W. Kernighan and D.M. Ritchie. The C Programming Language 2nd Edition, (ANSI features) Prentice Hall, 1989.
3. Peter A Darnel and Philip E. Margolis, C : A Software Engineering Approach, Narosa Publishing House, 1993.
4. Robert C. Hutehisonand Steven B. Just, Programming using C Language, McGraw Hill, 1988.
5. Les Hancock and Morris Krieger, The C Primer, McGraw Hill, 1988.
6. V. Rajaraman, Programming in C, Prentice Hall of India, 1994.
7. Byron S. Gottfried, Theory and Problems of Programming with C, Tata McGraw-Hill Publishing Co. Ltd., 1998.
8. C.E. Froberg, Introduction to Numerical Analysis, (Second Edition), Addison-Wesley, 1979.
9. James B. Scarborough, Numerical Mathematical Analysis, Oxford and IBHPublishing Co. Pvt. Ltd. 1966.
10. Melvin J. Maron, Numerical Analysis A Practical Approach, Macmillan publishing Co., Inc. New York, 1982.
11. M.K. Jain, S.R.K. lyengar, R.K. Jain, Numerical Methods Problems and Solutions, New Age International (P) Ltd., 1996.

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12. M.K. Jain, S.R.K. lyengar, R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International (P) Ltd., 1999.
13. R.Y. Rubistein, Simulation and the Monte Carlo Methods, John Wiley, 1981.
14. D.J. Yakowitz, Computational Probability and Simulation, Addison-Wesley, 1977.

PAPER - III - (OPTIONAL)
(IV) PRACTICAL
PROGRAMMING IN C AND NUMERICAL ANALYSIS

LIST OF PRACTICAL TO BE CONDUCTED...

1. Write a program in C to find out the largest number of three integer numbers.
2. Write a program in C to accept monthly salary from the user, find and display income tax with the help of following rules :

Monthly Salary	Income Tax
9000 or more	40% of monthly salary
7500 or more	30% of monthly salary
7499 or less	20% of monthly salary

3. Write a program in C that reads a year and determine whether it is a leap year or not.
4. Write a program in C to calculate and print the first n terms of fibonacci series using looping statement.
5. Write a program in C that reads in a number and single digit. It determines whether the first number contains the digit or not.
6. Write a program in C to computes the roots of a quadratic equation using case statement.
7. Write a program in C to find out the largest number of four numbers using function.
8. Write a program in C to find the sum of all the digits of a given number using recursion.
9. Write a program in C to calculate the factorial of a given number using recursion.
10. Write a program in C to calculate and print the multiplication of given 2D matrices.
11. Write a program in C to check that whether given string palindrome or not.
12. Write a Program in C to calculate the sum of series:

$$1 + x + \frac{1}{2!}x^2 + \frac{1}{3!}x^3 + \ldots\ldots + \frac{1}{n!}x^n$$

13. Write a program in C to determine the grade of all students in the class using Structure. Where structure having following members - name, age, roll, sub1, sub2, sub3, sub4 and total.
14. Write a program in C to copy one string to another using pointer. (Without using standard library functions).
15. Write a program in C to store the data of five students permanently in a data file using file handling.

Padmavali Dr. Shabnam Khan. Neelam Sharma (Dr. Rakesh Tiwari) (Dr. Asha Rani Das) Dr. Rajni Verma

SOCIOLOGY

B.A. PART- III

PAPER- I

FOUNDATIONS OF SOCIOLOGICAL THOUGHT

UNIT-I **August Comte:** The Law of Three Stages, Positivism, Hierarchy of Science.

Durkheim: Social Solidarity and Suicide

UNIT-II **Karl Marx:** Dialectic Materialism, Class Struggle and Surplus value.

Max Weber: Bureaucracy, Authority and the Protestant Ethic and the spirit of Capitalism.

UNIT-III **Pareto:** Circulation of Elits and Logical and Nonlogical action.

Spencer: Social Darwinism, Superorganic evolutions.

UNIT-IV **Thorstein Veblen:** The Theory of Leisure Class, Theory of Social Change

R.K. **Morton**: Functionalism and Reference Group.

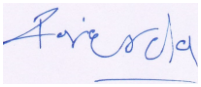
UNIT-V **Development of Sociological thought in India:-**

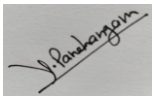
Mahatma Ghandhi : Ahimsa, Satya Graha and Trusteeship.

RadhaKamal Mukherjee: The Concept of Value.

ESSENTIAL READINGS-

1. Barres, H.E.: Introduction to the sociology, Chicago the University of Chicago press 1959.
2. Coser, Levis a.: Master of Sociological thought, New York Harcourt Brace Jovanovich 1979.
3. Singh, Yogendra- Indian sociology: social conditioning and emerging friends. New Delhi vistaar 1986.
4. Zeitlin, Irving- (Indian edition) Rethinking sociology: A critigue of contemporary theory, Jorpur Rawl 1999.





Dr. Sapna Kor

SOCIOLOGY

B.A. PART- III

PAPER- II

METHODS OF SOCIAL RESEARCH

UNIT-I Social Research**: Meaning, Characteristics and Significance.**
Scientific Methods, Hypothesis.

UNIT-II **Qualitative Research:** Ethnography, Observation, Case Study, Content analysis.

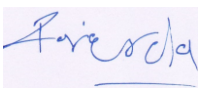
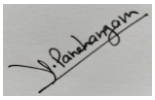
UNIT-III **Research design:** Exploatory, Descriptive, Explanatory, Experimental and Diagnostic.

UNIT-IV **Tools and Techniques of Social Research:** Social Survey, Sampling, Questionnaire, Interview- Schedule and Interview - Guide

UNIT-V **Social Statistics:** Meaning, Importance and Limitations.
Graphs, Diagram and Measures of Central Tendency- Mean, Mode, Median, Co-relation, Use of Computer in Social Research.

ESSENTIAL READINGS-

01. Young, P.V. (1977). Scientific Social Surveys and Research. Prentice Hall of India. New Delhi.
02. Bruce, C., & Margaret, M. (1993). Approaches to Social Research, New York: Oxford University Press.
03. Cohen, M & Nagel, E. (1994). An Introduction to Logi and Scientific Metod. New York: Harcourt, Brace & Company.
04. Forcese, D., & Richer, S. (1973). Social Research Methods. Cliffs: Englewood, Cliffs, NJ.
05. Moser, C.A. (1962). Survey Methods in Social Research Investigation. London: Heinemann, Printce Hall.
06. Goode, & Hatt. (1952). Methods in Social Research. New York: MC Graw Hill Publishers.

Dr. Sapna Kor

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. अंतिम वर्ष

सत्र 2021 – 22

विषय – नृत्य (भरत नाट्यम)

बी.ए. भाग (3) के लिये इस विषय में प्रायोगिक और सैद्धांतिक दो भाग होगें। प्रायोगिक 50 अंक एवं सैद्धांतिक 100 अंक का होगा। इस हेतु 50–50 अंक के दो प्रश्नपत्र होंगे। प्रत्येक वर्ष के पूर्णांक कुल मिलाकर 150 अंक के होगें।

क्र	विवरण		पूर्णांक	उत्तीर्णांक
1	सैद्धांतिक प्रथम प्रश्न पत्र	–	50	17
2	सैद्धांतिक द्वितीय प्रश्न पत्र	–	50	17
3	प्रायोगिक	–	50	17
		योग	**150**	**51**

सैद्धांतिक (विस्तृत पाठ्यक्रम)

प्रथम प्रश्न पत्र

शीर्षक – नृत्य का इतिहास एवं सामान्य अध्ययन

1. **नृत्य का इतिहास** – 1. राजपूत काल 2. मुगल काल 3. ब्रिटिश काल 4. स्वतंत्र भारत में नृत्य (आधुनिक काल)
2. **विभिन्न शास्त्रीय नृत्य प्रणालियों की संक्षिप्त जानकारी**
   1. कुचिपूड़ी 2. मोहिनीअट्टम 3. मणिपुरी 4. छाऊ 5. सत्रिय
3. **नवरस विवरण**
4. **भारतीय प्रेक्षागृहों की जानकारी (नाट्यशास्त्र के अनुसार)**
   त्रयस्त्र, चतस्त्र एवं विकृष्ट प्रेक्षागृह
5. **लोकधर्मी नाट्य परंपरा** – संक्षिप्त जानकारी
   लोकनाट्य –
   1. यक्षगान 2. तेरूकुतु 3. पंडवानी
   लोकनृत्य परिचय
   1. भांगड़ा 2. कोलाट्टम 3. कोरतिकुमि

16/03/2021

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

सैद्धांतिक (विस्तृत पाठ्यक्रम)

सत्र 2021 – 22

द्वितीय प्रश्न पत्र

शीर्षक – शास्त्रीय नृत्य सिद्धान्त

1. **ताण्डव और लास्य नृत्य का परिचय**
2. **नायक – नायिका भेद निरूपण**
3. **पादभेद– (1) चारी (2) स्थानक**
4. **भरतनाट्यम पद्धति के क्रमों (मार्गम का संक्षिप्त विवरण)**
   1. वर्णम् 2. कीर्तनम् 3. जावली 4. तिल्लाना 5. श्लोकम्
5. **वरिष्ठ नृत्य कलाकार की संक्षिप्त जीवनी**
   1. श्रीमती रूक्मिणी अरुण्डेल 2. श्रीमती बाला सरस्वती

प्रायोगिक

1. **मौखिक मुद्रा प्रदर्शन –**
   (1) असंयुक्त हस्त की शेष मुद्राओं (सर्पशीर्ष से त्रिशूल तक) का विनियोग (श्लोक सहित)
   (2) जाति हस्त, (3) दशावतार हस्त

2. **कार्यक्रम विभाग**
   (1) पंचजाति (तत्मेट्टी के अनुसार)
   (2) अष्टपदी अथवा कीर्तनम्
   (3) पदम् अथवा जावली
   (4) देहाभ्यास, समग्र अड़वु संचालन

16/03/2021

B.A. - PART- III

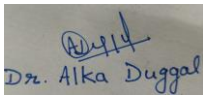
HOME SCIENCE
Paper –I
"Human Development"

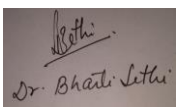
UNIT- I 1. Development-meaning of child growth and development Deferent aspects of growth, principal of development. Factors affecting child development, heredity and environment.

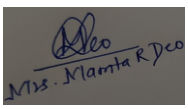
2. Stages of development –
   1. Physiology of pregnancy
   2. Prental (a) Reproductive system
      (b) Prenatal development
   3. Infancy (a) Early infancy
      (b) Babyhood
   4. Childhood (a) Early childhood
      (b) Late Childhood
   5. Adolescence (a) Early adolescence
      (b) Late adolescence

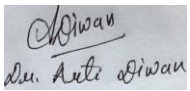
(i) Prental growth and development –
   (a) Sources of studying prenatal life
   (b) Stages of prenatal growth and development
   (c) Factors affecting prenatal growth and development
      (1) Mother's food
      (2) Health of mother
      (3) Narcotics
      (4) Age of parents
      (5) Effect of season
      (6) Emotion of mother

UNIT- II 1. Effect of normal and scissoring delivery.
2. Adjustment to new environment-
   (a) Temperature
   (b) Respiration
   (c) Food consumption
   (d) Excretion





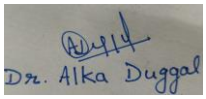


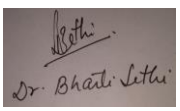
3. Physical development of infant-
   (a) Physical proportion
   (b) Height
   (c) Weight
   (d) Pulse rate
   (e) Respiration rate
   (f) Body temperature
   (g) Frequency of hunger.

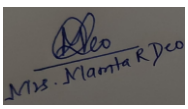
4. Sensory development pf infant
   (a) Light
   (b) Sound
   (c) Taste
   (d) Smell
   (e) Skin sensitivity
5. Motor activity of infants-
   (a) Mass activities
   (b) Specific activities –
      (i) Reflex activities
      (ii) Advantages of reflex action
6. Emotions of infants-
   (a) Types of emotions
   (b) Significance of emotions
7. Characteristics of infant behaviour-
   (a) Dependency
   (b) Individual Difference
   (c) Adjustment

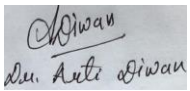
Unit –III Childhood: Adolescence.

1. Characteristic of this stage.
2. Factors affecting growth and development during childhood and adolescence.
3. Physical growth height, weight, body proportion, teeth
4. Growth and development of internal organs (a) Nervous (b) Mental (c) Circulatory system (d) Digestive system, (e) Respiratory system (f) Tissues and muscles systems.
5. Development of motor abilities (i) Types of motor abilities 9ii) importance and characteristics of motor abilities in childhood (iii) Development of motor skills, Types of motor skills (iv) Delayed motor development.







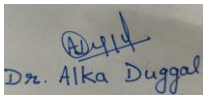
Unit –IV 6. Development of emotional behavior- characteristic special emotions (Affection, anger, fear, jealousy and worries) factors affecting emotional behavior.

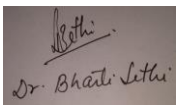
7. Social Developments stages – (a) during infancy, (b) nursery school period (c) elementary school period (d) Factor affecting social development.
8. Development of intelligence – types according to throndyke, theories regarding intelligence.

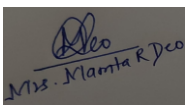
Unit –V 9. Play meaning of play, work and play, theories of play, characteristics of children's play, types of play, factors effecting play and importance of play.

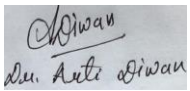
10. Habits:
    1. Definition.
    2. Functions performed by habits.
    3. Habits and learning
    4. Laws of habit formation-identical to laws of learning.
    5. Habit formation.
        (a) Principal of habit formation.
        (b) Rules for habit formation.

11. Children delinquency – Types causes and remedial measures.







द्वितीय पेपर

आहार एवं पोषण विज्ञान

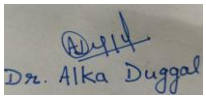
पूर्णांक – 50

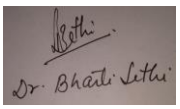
यूनिट – 1 पोषण

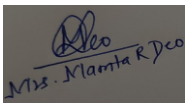
1. पोषक की परिभाषा
2. कार्यो के आधार पर पौष्टिक तत्वों का वर्गीकरण।
   (अ) उष्मा प्रदान करने वाले – प्रोटीन, खनिज तत्व।
   (ब) शरीर का निर्माण करने वाले–प्रोटीन, खनिज तत्व।
   (स) सुरक्षा व नियमन करने वाले जल, जीवन तत्व।
3. कार्बोज– परिभाषा, कार्य पाचन, अभिपोषण, चायपचय, रक्त शंर्करा स्तर व असक नियमन अधिकता का प्रभाव प्राप्ति का प्रभाव का साधन एवं दैनिक आवश्यकता।
4. वसा – परिभाषा, कार्य, वर्गीकरण, पाचन, अभिशोषण, चयापचय, संतृप्त व असंतृप्त वसीय अम्ल, आवश्यक वसीय अम्ल, कोलेस्टोरॉल, कमी व अधिकता के प्रभाव एवं दैनिक आवश्यकता।
5. प्रोटीन – परिभाषा, कार्य, वर्गीकरण, पाचन, अभिशोषण, चयापचय, नाइट्रोजन संतुलन, प्रोटीन का जैविक मूल्य, प्रोटीन का पूरक व कैलोरी कुपोषण, प्राप्ति के साधन एवं दैनिक आवश्यकता।
6. खनिज तत्व – सामान्य वर्गीकरण व कार्य, अवशोषण का प्रभावित करने वाले तत्व कमी व अधिकता के प्रभाव साधन (कैलिशयम, फास्फोरय, लौहलवण, आयोडिन सोडियम, व क्लोराईड)
7. विटामिन्स – (जीवन तत्व) सामान्य वर्गीकरण व कार्य, कमी व अधिकता के प्रभाव, प्राप्ति के साधन, (जीवन सत्व ए.बी.सी.डी.ई. के)
8. जल– सामान्य कार्य, जल का संतुलन अधिकता के प्रभाव व निर्जलीकरण।

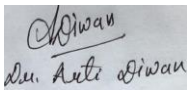
यूनटि – 2 आहार

1. आहार का वर्गीकरण व कार्य, आधारित चार–भोज्य समूह व सात–भोज्य समूह।
2. आनाज – प्रकार, रचना, संगठन, पकाने से पहले की प्रक्रिया – मीलिंग, पालिशिंग, पारवाईलिंग, फ्लोरिंग, पारचिंग, आनाज, को उपयोग कराने के विभिन्न तरीके, आनाज–ताप, क्षार खमीरीकरण व ब्रीडिंग के प्रभाव।
3. दालें – प्रकार, संगठन, अंकुरण, व खमीरीकरण के प्रभाव।
4. दुध – प्रकार, संगठन, दूध से बने पदार्थ – दही, मकखन, चीज आदि पाश्च्युराजेशन एवम् होमाजीनाइजेशन।
5. फल व सब्जियां – वर्गीकरण, संगठन, वर्णक प्रोटिन का महत्व, परिपक्व होने की प्रक्रिया।
6. अण्डा –संगठन, पकाने का प्रभाव।
7. मांस मछली, पोल्ट्री – संगठन, पकाने से होने वाले परिवर्तन।
8. शक्कर, गुड, शहद – संगठन, प्रकार, विधियों में उपयोग।
9. पेय पदार्थ – वर्गीकरण, पोषण की दृष्टि से महत्व अत्याधिक उपयोग का प्रभाव।
10. मसाले – प्रकार, संगठन, पोषण की दृष्टि से महत्व।







यूनिट – 3

1. खाद्य संरक्षण – उदेश्य, विवियां, घरेलु संरक्षण, औद्योगिक संरक्षण।
2. खाद्य पदार्थो में सडंद्ध – कारण, प्रकार, पहचान, उपचारात्मक विधिया।
    1. भोज्य विषाक्तता – कारण, प्रकार, पहचान, उपचारात्मक तरीकें।
    2. खाद्य मिलावट – आवश्यकता, प्रकार, महत्तपूर्ण मिलावटी पदार्थ, मिलावटी पदार्थो को पहचानने की सरल विधियां।
    3. आहार स्वास्थ्य व स्वच्छता – प्रकार उपचारात्मक तरीके।
    4. खाद्य संग्रहण – आवश्यकता, प्रकार उपयोग में होने वाले महत्वपूर्ण रसायन।

यूनिट – 4 आहार नियोजन :

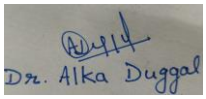
1. महत्व – आहार नियोजन के सिद्धांत प्रतिदिन की निर्धारित मात्रा (आर.डी.ए.), आहार आयोजन को प्रभावित करने वाले तत्व समय व शक्ति बचाने वाले आहार का आयोजन करना–
   (अ.) पहले से योजना बनाना
   (ब.) क्रय करने की योजना बनाना
   (स.) सरल आहार तालिका
   आर्थिक स्तर के आधार पर आहार का आयोजन करना । चुनाव संग्रहण पूरक पदार्थो का उपयोग, बचे खाद्य पदार्थो का उपयोग।
2. शिशु विभिन्न आयु में पौष्टिक तत्वों व खाद्य पदार्थो की आवश्यकता आहार माता का दूध, फार्मुला फीडिंग।
3. बालक का पोषण – आयु समूह की विशेषताएं, पौष्टिक तत्व एवं आहार को आवश्यकता, शालेय आहार कार्यक्रम – प्रकार महत्व , कीमत, पोषण स्तर, आहारीय व लक्षण शरीर मापन विधियां।
4. गर्भवस्था व छात्रीवस्था में पोषण – शारीरिक परिर्वतन, पौष्टिक तत्वों की आवश्यकता । असामान्य स्थितियां।
5. वृद्धावस्था में आहार एवं पोषण – शारीरिक परिर्वतन, पौष्टिक तत्वों की आवश्यकता, असामान्य स्थितियां

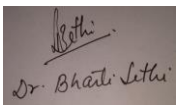
यूनिट – 5 उपचारात्मक पोषण – परिभाषा

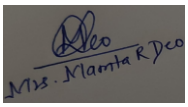
सामान्य आहार परिवर्तन – तरलता, पौष्टिक तत्व, गंध की उपस्थिति/अनुपस्थिति, कुछ खाद्य पदार्थो का सम्मिलित न करना।

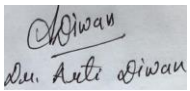
चयापचयी रोग –

1. मधुमेह – परिभाषा, लक्षण, कारण, इन्सुलिन के प्रकार, आहार का प्रभाव, हाइपोग्लायसेमिक दवाईयां, मधुमेह में आसामान्य स्थितियां, मधुमेह व गर्भावस्था, मधुमेह व बाल्यावस्था।
2. अधिक वजन/ कम वजन – परिभाषा, कारण, उपचारात्मक तरीके, असामान्य स्थितियां।
   पौष्टिक तत्वों की कमी से होने वाले रोग–







1. रक्तहीनता – प्रकार, कारण, पहचान, आहार।
2. एविटामीनोसिस – प्रकार, कारण, आहार।
3. प्रोटिन कैलोरी कुपोषित – कारण, उपचारात्मक तरीके।
   रोग जिसमें आहारीय चिकित्सा सम्मिलित है–
4. यकृत के रोग – प्रकार, कारण, आहार, (पौष्टिक तत्वों की आवश्यकता)

आमाशय के रोग–

1. पेप्टिक अल्सर – कारण, लक्षण, आहार (पौष्टिक तत्वों की आवश्यकता)
2. अपचन – कारण, पौष्टिक तत्वों की आवश्यकता।
3. अतिसार – प्रकार , कारण, आहार।
4. कब्ज – प्रकार, कारण, आहार।
5. उक्त रक्तचाप – कारण, आहार।

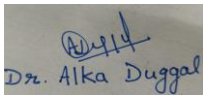
गृह विज्ञान
प्रायोगिक

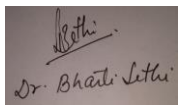
पूर्णांक : 50

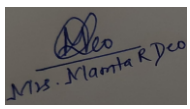
1. अनाज – दालें, अण्डा, दुध, मेवे, सब्जियां, फलों के उपयोग करने की कोई भी तीन पात्र विधियों को प्रायोगिक रिकार्ड बुक में लिखना। कौलोरी एवं प्रोटीन की गणना।
2. आहार आयोजन –
   (अ) गर्भवती महिला
   (ब) कब्ज की स्थिति
   (स) मधुमेह रोग
   (द) अधिक वजन की स्थिति
3. विभिन्न आर्थिक स्थिति में आहार योजनां
4. खाद्य संरक्षण – कोई भी चार विधि से बनायी जाये।
5. सम्पूरक भोजन – आयोजन, गणना।
6. व्यक्तित्व मापन विधि
7. बुद्धिमापन विधि

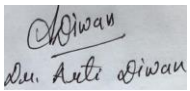
प्रायोगिक परीक्षा अंको का विभाजन

सेशनल	10
योजना	10
तैयारी	10
गणना	10
मैखिक प्रश्न	10
कुल अंक	50



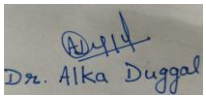


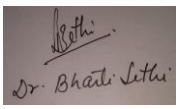


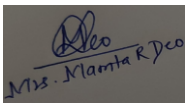
References Books:

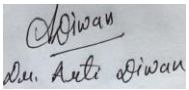
Notmal & Theropentic Nutrition.

1. C.H. Robinson – Normal & Therapetic Nutrition.
2. F.P. Anita – Clinical Nutrition & Dicterics.
3. M. Swaminathon - Essentials of Nutrition Vol. I & II.
4. P. Rajalaxmi – Applied Nutrition
5. C. Gopalan-etal – The Nutrition value of Lndian Foods. ICHR. 2020.
6. Mangodekonge – Normal & Therapentic Nutrition (In Hindi).
7. Jyotikulkarni – Normal & Therapentic Nutrition.
8. Geeta Pushpa Shaw –
9. Kreuse M.N. – Food Nutrition & Diet Therapy.
10. आहार एवं पोषण – डॉ. अरूणा पल्टा, शिवा प्रकाशन, इन्दौर
11. खाद्य परिक्षण – डॉ. अमिता सहगल, शिवा प्रकाशन, इन्दौर







हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

दर्शन शास्त्र

बी.ए. भाग तीन दर्शन शास्त्र विषय में कुल दो प्रश्न पत्र होंगे तथा प्रत्येक में 75 अंक होंगे। प्रत्येक प्रश्न पत्र पांच इकाईयों में विभाजित है। प्रथम प्रश्न पत्र 'तर्कशास्त्र' अनिवार्य है। द्वितीय प्रश्न पत्र में दो विकल्प दिये गये हैं –

1. ज्ञान मीमांसा एवं तत्व मीमांसा (भारतीय एवं पाश्चात्य)
2. ग्रीक दर्शन

बी.ए. भाग – तीन
दर्शन शास्त्र
प्रश्न पत्र– प्रथम तर्क शास्त्र (कुल 75 अंक)

इकाई –1
1. तर्क शास्त्र : अर्थ, परिभाषा, स्वरूप, उपयोगिता
2. आगमनात्मक एवं निगमनात्मक तर्क
3. अनाकारिक तर्कदोष

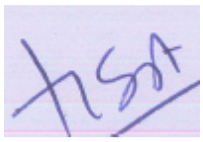
इकाई –2
1. सत्यता एवं वैधता
2. प्रतिज्ञप्ति – वर्गीकरण, प्रतिज्ञप्ति की बुलीय व्याख्या
3. निरपेक्ष न्याय वाक्यों के मानक आकार एवं न्याय वाक्यों के परीक्षण हेतु वेन रेखा पद्धति
4. आकारिक तर्कदोष

इकाई –3
1. (अ) संयोजन (ब) निषेधक (स) वियोजक (द) आपादन (इ) द्विआपादन
2. तार्किक युक्तियों की वैधता की परीक्षा के लिए सत्यता सारिणी विधि

इकाई –4
1. विज्ञान एवं प्राक्कल्पना
2. वैज्ञानिक व्याख्या की प्रकृति
3. वैज्ञानिक व्याख्या एवं अवैज्ञानिक व्याख्या में भेद
4. मिल की पद्धतियां (अन्वय, व्यतिरेक, अन्वय व्यतिरेक की संयुक्त पद्धति)

इकाई –5
1. अनुमान
2. अनुमान के प्रकार
3. हेत्वाभास

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।



हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

बी.ए. भाग –तीन
दर्शन शास्त्र
प्रश्न पत्र– द्वितीय (वैकल्पिक)

(अ) ज्ञान मीमांसा एवं तत्व मीमांसा (भारतीय एवं पाश्चात्य)

इकाई –1 1. ज्ञान मीमांसा एवं तत्व मीमांसा : स्वरूप एवं विषय वस्तु
ज्ञान प्रमाण : प्रमा एवं अप्रमा

इकाई –2 1. प्रामाण्य : स्वतः प्रामाण्य एवं परतः प्रामाण्य
ख्यातिवाद : सत्ख्यातिवाद, अख्यातिवाद, अन्यथा ख्याातिवाद , अनिवर्चनीय ख्यातिवाद

इकाई–3 1. कारणता का सिद्धांत (कारणकार्यवाद)

अ. सत्कार्यवाद

ब. असत्कार्यवाद

2. सत्य के सिद्धांत

अ. संवादिता

ब. संसक्तता

स. अर्थक्रियावादी सिद्धांत

इकाई–4 1. जड़वाद

2. अध्यात्मवाद

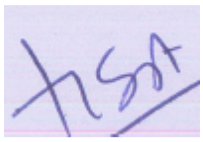
3. वस्तुवाद

इकाई–5 1. बुद्धिवाद

2. अनुभववाद

3. कांट का परीक्षावाद

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।



बी.ए. भाग –तीन
दर्शन शास्त्र
प्रश्न पत्र– द्वितीय (वैकल्पिक)
ग्रीक दर्शन

इकाई–1
1. ग्रीक दर्शन : मुख्य विशेषताएं
2. थेलिस
3. एनेक्जिमेंडर
4. एनेक्जिमेनीज

इकाई–2
1. हेराक्लाइट्स
2. जेनोफेनीज
3. पार्मेनाइडीज
4. जीनो

इकाई–3
1. एम्पीडोक्लीज
2. एनेक्जागोरस
3. ल्यूसिपस
4. डेमोक्राइट्स

इकाई–4
1. सोफिस्ट विचारक : प्रोटागोरस, गार्जियस
2. सुकरात – सुकरात पद्धति, नैतिक विचार

इकाई–5
1. प्लेटो– प्रत्ययवाद, आत्मा
2. अरस्तू – प्लेटो के प्रत्ययवाद की आलोचना, कारणता सिद्धांत

उपरोक्त समस्त संशोधन विषय की स्पष्टता व ज्ञानवर्धन को ध्यान में रखकर समिति के सभी सदस्यों की सहमति से किया गया ।

निसाब उर्दू अदब
पहला पर्चा
'नस्र' (पेपर कोड–0262) नं. 75
(दास्तान, ड्रामा, अफसाना)

निसाबः

दस्ताना :

1. किस्सा आजाद बख्त : इन्तेखाब बागोबहार मीर अमान।
2. मुलात मलकाए महन निगार : इन्तेखाब फसनए अजाइब रजब अली बेग शुरूर।

ड्रामा :

1. डाक्टर तयकीन की उलझन : अज इब्राहीम युसुफ
2. आगरा बाजार : अज हकीब तनवीर

अफसानाः

1. कफन : प्रेमचंद्र
2. नया कानून : सजादत हुसैन मन्टी
3. यूकिलिप्टस की हाली : कृष्ण चन्द्र
4. लाजवंती : राजेन्द्र सिंह वैदी
5. दो भीगे हुए लोग : इकबाल मजीद
6. झूठा संच/काठ का घोड़ा : रतन सिंह
7. छीमक : गयास अहमद गद्दी
8. अफसाना : जीलानी बानो

इकाईयां :

इकाई– 1 शामिले निसाब असनाप पर सवालात नं. 15

इकाई– 2 दास्तान निगारो पर सवालात नं. 15

इकाई– 3 ड्रामा निगारों पर सवालात नं. 15

इकाई– 4 अफसाना निगारों पर सवालात और अफसानों का खुलासा और जायजा नं. 15

इकाई– 5 दस्ताना और अफसानो से तशरीह नं. 15

दूसरा पर्चा (शायरी)
(पेपर कोड–0263)
(कसायूद, मरासी और मजमून निगारी) नं. 75

निसाबः

कसाइद :

1. फज्र होते जो गई आज मेरी आंख झपकअज सौदा देहलबी
2. सवन में दिया फिर महे शव्वाल दिखाईअज जौक देहलवी
3. स्मते काशी से जानिबे मथुरा बादल अज मोहसिन काकोरवी

मरासीः

1. किस शेर की आमद है के रन कॉफ रहा है अज दबीर (15 बंद)
2. ब खुदा फारसे मैदाने तहव्वूर या हुर अज अनील (15 बंद)

इकाईयां :

इकाई– 1 शामिले निसाब असनाफ पर सवालात नं. 15
इकाई– 2 कसोदा निगारों पर सवालात नं. 15
इकाई– 3 मर्तिया निगारों पर तन्कीदी सवालात नं. 15
इकाई –4 तशरीहजशारे कसाइद और गरासी नं. 20
इकाई– 5 अदबी माजू पर मजमून नं. 10

MANAGEMENT (प्रबंध)

PAPER - I

MONEY, BANKING TRADE & FOREIGN EXCHANGE M.M. : 75

(Paper Code-0269)

UNIT-I Difination of Money : Functions, impoertance & types Value of money, quantity theory. Cast transactions approach case balance approach & income approach.

UNIT-II Inflation : Cost push demand pull-effects of inflation and methods of control, deflation measures against deflation monetary standards gold and paper standards.

UNIT-III Banking types and their function : Credit creation & methods of control nationalisation of commercial books - R.B.I. and its functions financing.

UNIT-IV International and inter regional trade theory of comparative costs general equalibrium theory. Terms of trade, free trade versus protection. Dumping balance of trade and balance of payments.

UNIT-V Foreign exchange : Meaning, rate of exchange, its determination mint per theory, purchasing power parity theory Balance of payment theory Exchage control objects and methods of IMI.

BOOKS RECOMMENDED :

1. K.P.M. Sundram : Money, Banking & International Trade.
2. K.R. Gupta : International Economics.
3. Charies. P. : International Economics.
4. हरिशचंद्र शर्मा : मुद्रा एवं बैकिंग

PAPER - II

AUDITING, COSTING AND INCOME TAX M.M. : 75

(Paper Code-0270)

UNIT-I Principles of auditing :

Origin of Audit, the nature & definition of audit objects of audit, various class of audits and their advantages, audit under statute. The accounts of private firms, the audit of the accounts of private individuals the audit of the trust accounts.

UNIT-II Audit procedure and conduct of an audit :

Internal audit the qualities required of an auditor. Continuous and final or completed audit, consideration of the commencement of a new audit, audit note book methods of work.

UNIT-III The audit of cash transactions :

Audit of bank transections : Audit of petty of cash book : Audit of trading transctions. Internal check as regards cash, vouching, Internal check as regards wages. Audit of trading transaction : Purchases Purchases returns,. sales, sales returns, sales ledger.

UNIT-IV Fundamental of cost accountancy. Definition, Advantages, disadvantage and functions. Methods of cost accounting Unit costing. departmental costing. process costing. contract costing.; Elementary know ledger of Break even Analysis.

UNIT-V Income : tax on salary and capital gains, tax deduction at source, Rates of income tax and surcharge on income tax. Deduction in respect of C.P.F., L.I.C. premiums and commulative time deposits short term capital gains and long term capital gains deduction in respect of capital gains.

BOOKS RECOMMENDED :

1.	Agrawal & Khanuja	:	Cost Accounting
2.	Grewal & Shukla	:	Advanced Accounts
3.	Dr. R. R. Gupta	:	Cost Accounting
4.	D. N. Agarwal	:	The Higher Science of Accountancy.
5.	Bhagwati Prasad	:	Income Tax-Law & Practice
6.	Choudhary & Patel	:	Income Tax
7.	Dr. B. K. Agarwal	:	Income Tax
8.	Dr. S. M. Shukla	:	Auditing
9.	मेहरोत्रा	:	आयकर विधान एवं लेखे।

FUNCTIONAL ENGLISH

PAPER - I

C OMMUNICATION SKILL AND BROADCASTING M.M. 50

(Paper Code-0271)

.I Oral Communication

(1) Interview (2) Dictation
(3) Meetings (4) Seminars and Conference
(5) Group Discussion (6) Audio Visual Aids

I. Writing Skill

(1) Business Corrsepondance. (2) Agenda and Minutes.
(3) Advertising. (4) Reports

III. **Broadcastin**g.

(1) Fundamentals, of Broadcasting
(2) Radio as a medium of Broadcasting.
(3) T.V. as a medium of Broadcasting.
(4) Current affairs of general Knowledge.

PAPER - II

ADVANCED GRAMMER

(Paper Code-0272)

Section A

(1) Constituent-
Students will be requised to devide each Sentence into its Constituent and label eachA,V,C,O, or E.
(2) Use of dynamic and stative verb :-
(3) Use of Adjective and Adverb :-
(4) use of Prepositions :-
(5) Question Tag :-
(6) Nodal verb :-
(7) Introducting word ‘it’ There ‘
(8) Use of Sentence in the Passive.

Section - B 20

(1) Use of Redio and its Sentance.
(2) Use & Function of T.V.
(3) Importance of Non Communication.
(4) Importance of News papers in the modern context.

PRINCIPAL OF INSURANCE & PRACTICE

PAPER- I

PROPERTY AND LIABILITY INSURANCE **50 Marks**

(Paper Code-0273)

UNIT-I INTRODUCTION

Risk and Insurance; Insurable andnon-Insurable; Nature of Property and liability insurance, crop and cattle insurance, types of liability insurance reinsurance.

UNIT-II Basic concepts of Liability Insurance

(a) Basic concepts :- Specific and all risk insurance; valuation of risk; Indemnity contracts and specific value contracts; Average and contribution; Excess and short insurance careers.

(b) Liability Insurance:- Procedure for obtaining liability insurance. Legal position of insurance agent; construction and issue of policy; Records of liability insurance; policy conditions.

UNIT-III Types of liability Insurance policy-

Mandatory public Liability Insurance.

Dwelling Property losses; Business interruption and related losses, Theft Insurance contracts, Budgetory covers,m Auto Insurance,Medical Benefit Insurance; Dishon-esty, disappearance and destruction insurance; Employer's Liability; Aviation Insurance Personal and residential Insurance; Boiler Machinery insurance; commerical enterprises and industrial property insurance.

UNIT-IV Insurance Problems of Institutions

Insurance Problems of educational and religious institutions hospitals, clubs and assoriation; Professional package contracts; Errors and omissions insurance; professional liability insurance; Accountants liability insurance; Limits on amount of insurance Marketing and underwriting of liability insurance; Finance of liability insurance.

UNIT-V Adjustment of Losses and claims compensation:-

Nature of Losses and their adjustment: Procedure of adjustment Functions of adjuster's; Responsibilities of adjuster's; survey of losses; Procedure for preparing claims statements; Documents in use in claim settlements. Requirement of the insured in the event of loss. Apportionment and loss valuation; statutory control over liability insurance in India.

Liability policies by General Insurance Corporation of India.

PAPER - II

GROUP INSURANCE ANDRETIREMENT BENEFIT SCHEMES

(Paper Code-0274)

50 Marks

UNIT - I Introduction

Superannuation Schemes I
Superannuation Schemes II

UNIT-II Superannuation Schemes III

Gratuity Schemes

UNIT-III Group Life Insurance Schemes I

Group Life Insurance Schemes II

UNIT-IV Provident Fund & Employees Family, Pension and Deposit linked insurance Schemes.

Taxation Treatment of provisions for retirement Benefits-I

UNIT-V Taxation Treatment of Provisions for Retirement Benefits II

Group Schemes and Data Processing.

THEORY

HISTORY OF INDIAN PAINTING (Paper Code-0286)

(Bangal School to Modern age) **50 Marks**

Bangal School	-	Abanendra Nath Tagor
		Rabindra Nath Tagor
		Gaganendra Nath Tagor
		Nandalal Bose
Modern Age	-	Raja Ravi Varma
		Amrita Sher Gil
		Yamini Ray
Progresive Art Group		
Souza	-	M.F. Husain
		S.H. Raza
		N.S. Bendra
		K.K. Hebber

List of Book Recomended for theory :

- Bharatiya Chitrakala Ke Itihas - Shym Bihari Agrawal
- Kala Vilas - R.A. Agrawal

PRACTICAL

There will be two practical paper. Evalution will be made by the external and the internal examiners togather, and sessional marking is made by the class teacher.

The time of each paper is four hour's and there will be a half hour's recess in between.

PAPER - I

Copy from Indian meniature painting **Total Mark - 50**

Scheme of examination **Examination - 40**

Time - 4 Hours Sessional - 10

Paper - 1/4 Imp size

Medium - Water colour or poter colour

Sessional mark - 10

Minimum class work to be submitted five painting size 1/4 Imp paper Copying

from the Indian miniature painting style Mugal. Pahadi, Rajsthani.

PAPER - II

CREATIVE COMPOSITION

Scheme of examination — Total Mark - 50

Time Four hour's — Examination - 40

Size 1/2 Imp. paper — Sessional - 10

Medium - Water, Oil, acrylic or any

Sessional mark - 10

Minimum Class work to be submitted -

Five painting size 1/2 Imp.

Student will be experimented ith any media and form.

Above syllabus based on the syllabus of following Universities.

1. Vikram University, Ujjain
2. Rani Durgavati Vishwavidyalaya, Jabalpur.
3. Indira Kala Sangeet Vishwavidyalaya, Khairagarh.

DEFENCE STUDIES

PAPER-I

PROBLEMS OF WAR AND PEACE (Paper Code-0277)

Aim : The objective of this paper is to acquaint the students about the multidimensional problems of war and peace.

Note : Question will be set from each unit, there will be only internal choice.

Unit-I U.N.O. AND WORLD PEACE

1. Organs and its role.
2. Main specialized agencies of U.N.O.
3. Role of U.N.O. in world peace.
4. Peace keeping forces of the U.N.O.
5. Veto power and Security Council.

Unit-II WAR AND PEACE

1. Sattlement of International Disputes.
2. Diplomatic agents and Consuls.
3. War Crimes.
4. Neutrality.
5. Intervention.

Unit-III HUMANITARIAN LAW

1. Basic concepts and development of Humanitarian law.
2. UN General Assembly declaration of human rights on Dec. 10, 1948.
3. Protection of Victims and defenceless in armed conflict, POWs, wounded and civilians in Armed Forces.
4. Central Human Right Commission : Organisation and Function.
5. State Human Right Commission : Organisation and Function.

Unit-IV REFUGEE LAW

1. Meaning, Concept and causes of Refugee.
2. Refugee and IDPs.
3. Refugee law in India.
4. Refugee Problem in South Asia.
5. Role of International Committee of Red Cross and UNO in Refugee Problems.

Unit-V LAWS OF WAR

1. Law of Land war.
2. Law of Sea war.
3. Law of Air war.
4. Space law.
5. The International Court of Justice.

SELECTED READINGS :

1. Maunce clark, J:Readings in the Economics of War.
2. International Security : Modern political Science series.
3. Rajani Kothari : Word order.
4. Openhem, I : Use of Forces by states and International law.

PAPER - II

MODERN WARFARE (Paper Code-0278)

AIM : To enable students to appreciate the impact of Political, economic and technological developments on the patterns of conflicts between nations.

Note : Question will be set from each unit, there will be only internal choice.

UNIT-I
1. Development of Nuclear weapons.
2. Effects of Nuclear Explosion.
3. Spread of Nuclear Weapons.
4. Missile and their characteristics.
5. Type of Missiles.

UNIT-II
1. Trends in Science and Technology and their impact on war.
2. Role of Research and Development.
3. Development of Weapons and their impat on tactics
4. Command, Control, Communication and Intelligence (C^3 I) in Modern Warfare.
5. Elements of National Power.

UNIT-III
1. Military Satellites.
2. Explosive Bombs.
3. War Gases.
4. Micro Organs : as a weapons.
5. Smart Weapons.

UNIT-IV
1. Rocket Technology and India.
2. Missile Technology and India.
3. Nuclear Technology and India.
4. Atomic Minerals and India.
5. Space Technology and India.

UNIT-V
1. New word order - Political, Social and Economical.
2. Alliance and Regional co-operation.
3. Mobilisation of resources for war.
4. War time economics.
5. New trends.

SELECTED READINGS :

1.	Halailan Morton	:	Coutemporary Military strategy
2.	Brodue, Y.	:	Strategy in the Missile Age.
3.	Markabi, Y.	:	Nuclear war and Nuclear peace
4.	Osanka. F.M.	:	Modern Guerilla warfare
5.	Gerald. J.	:	Defence Psychology
6.	Know Kalus	:	Science and Defence
7.	Pandey Girish Kant	:	Yudh mein Vigyan avem Tackniki

PRACTICALS

There shall be practical examination of 3.5 hours duration carrying. 50 marks

The division of marks shall be as follows :

(1)	Plain Table Survey	:	15	Marks.
(2)	Experimental Military Psychology	:	15	Marks.
(3)	Group Descussion & Lectring	:	05	Marks.
(4)	Viva-Voce	:	05	Marks.
(5)	Sessional work & Record	:	10	Marks.

SECTION - A

Plain Table Survey by inter section methods.
(Ateast ten exercises in a session).

SECTION - B

Military psychology Experiment :

(1) Muller-Layer-IIlusion test.

(2) Koh's Block Design Test.

(3) Allexander Pass Along Test.

SECTION - C

Group Discussion and Lectures based on current topic on any international Problems as issue.

EDUCATION

PAPER - I

EDUCATIONAL MANAGEMENT AND EDUCATIONAL TECHNOLOGY

(Paper Code-0255)

COURSE OBJECTIVES

1. To develop knowledge and understanding of the meaning, scope process and types of management.
2. To develop the ability to identify the roles of participating members (individual or collective) and to plan various institutionalized managerial activities.
3. To develop the ability of making objective decisions in educational management.
4. To enable the students to understand about the concept, nature and acope of educational technology.
5. To expose the students to the basic developments in Educational Technology.

COURSE CONTENTS

UNIT-I - Concept of Educational Management : Meaning, nature, need and scope.

- Types of Educational Management : Centralized and decentralized, external and internal. Authoritarian / autocratic and democratic, dynamic / creative and Laissez-faire.

UNIT-II - Managerial Behaviour : Factors affecting managerial behaviours; personal, social, cultural, political, institutional etc.

- Aspects of institutional management : Curricular and co-curricular programmes; student welfare auxiliary services including school health services; school plant including equipment and assets; sanitation and beautification; institutional planning; time table; interpersonal relationship; institutional climate and discipline;

-

hostel and staff accommodation; management of finance; home, school and community relationships; evaluation of students achievement and promotion; admission, office management etc.

UNIT-III - Educational planning : Meaning, need and significance of educational planning; types of educational planning, strategies in educational planning; steps in educational planning.

UNIT-IV - Communication Process : theory, concept, nature, process, components, types of classroom communication, mass media approach in educational technology.

UNIT-V - System Approach to Instruction : System approach in instructional process, instructional system designing : concept, components, physical and human resources, steps.

- Innovations in Educational Technology : Programmed learning, micro and macro teaching, team teaching.
- Personalized system of instruction, computer assisted instruction, simulated teaching distance teaching.

BOOKS :

1. Educational Technology. R.A. Dhaowa, Lall Book Depot, Mearut.
2. शैक्षणिक तकनीकी आर. ए. वर्मा, लाल बुक डिपो मेरठ।

PAPER - II

PHILOSOPHY OF EDUCATIONAL

(Paper Code-0256)

UNIT-I - Naturatism

- Progmation

UNIT-II - Realism

- Ideatims

UNIT-III - Dayanand

- Gandhi
- Tagore

UNIT-IV - Aurbindo

- Vivekanand
- Azkir Hussan

UNIT-V - Montesson

- Froebel
- Festalloggi.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 3861 /अका./2021 दुर्ग, दिनांक 30/7/21

प्रति,

प्राचार्य,

समस्त संबद्ध महाविद्यालय,

हेमचंद यादव विश्वविद्यालय,

दुर्ग (छ.ग.)

विषयः— स्नातक स्तर भाग–तीन के पाठ्यक्रम विषयक।

संदर्भः— संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05. 2019।

————00————

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–तीन के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2021–22 से लागू किये जाते हैंः—

1. बी.ए. — आधार पाठ्यक्रम – हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान
2. बी.एस–सी. — आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.ए./बी.एस.सी (गृह विज्ञान) — आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।
4. बी.सी.ए. — भाग–3
5. बी.कॉम. — भाग–1, भाग–2 एवं भाग–3 का परिवर्तित पाठ्यक्रम सत्र 2019–20 में जारी कर लागू किया जा चुका है।

कृ.प.उ.

उपरोक्त विषयों को शिक्षा सत्र 2021–22 से संशोधित रूप में स्नातक स्तर भाग–तीन के लिए लागू किया जाता है स्नातक स्तर भाग–एक हेतु सत्र 2019–20 एवं स्नातक स्तर भाग–दो हेतु सत्र 2020–21 में लागू पाठ्यक्रम मान्य होंगे।

टीपः– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

कुलसचिव

क्र. 3862 /अका./2021

दुर्ग, दिनांक 30/7/21

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 के परिपेक्ष्य में सूचनार्थ
2. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. वेबसाईट प्रभारी, वेबसाईट पर पाठ्यक्रम प्रकाशित करने हेतु।
4. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website - www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of

B.Sc. Final Year
Session 2021-22

(Approved by Board of Studies)
Effective from July 2021

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-II examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the thirdyear.
2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-Iexamination.
3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognised by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIexamination.
4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIIexamination.
5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department orCollege.
6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in-

   (i) Foundation Course:

   (ii) Any one of the following combinations of three subjects:-

   1. Physics, Chemistry &Mathematics.
   2. Chemistry, Botany &Zoology.
   3. Chemistry, Physics &Geology.
   4. Chemistry, Botany &Geology.
   5. Chemistry, Zoology &Geology.
   6. Geology, Physics &Mathematics.
   7. Chemistry, Mathematics &Geology.
   8. Chemistry, Botany & DefenceStudies.
   9. Chemistry, Zoology & DefenceStudies
   10. Physics, Mathematics & DefenceStudies.
   11. Chemistry, Geology & DefenceStudies
   12. Physics, Mathematics &Statistics
   13. Physics, Chemistry &Statistics
   14. Chemistry, Mathematics &Statistics.
   15. Chemistry, Zoology &Anthropology.
   16. Chemistry, Botany &Anthropology.
   17. Chemistry, Geology &Anthropology.
   18. Chemistry, Mathematics &Statistics.

19. Chemistry, Anthropology & DefenceStudies.
20. Geology, Mathematics &Statistics.
21. Mathematics, Defence Studies &Statistics
22. Anthropology, Mathematics &Statistics
23. Chemistry, Anthropology & AppliedStatistics
24. Zoology, Botany &Anthropology
25. Physics, Mathematics &Electronics.
26. Physics, Mathematics & ComputerApplication
27. Chemistry, Mathematics & ComputerApplication
28. Chemistry, Bio-Chemistry &Pharmacy
29. Chemistry, Zoology &Fisheries.
30. Chemistry, Zoology &Agriculture
31. Chemistry, Zoology &Sericulture
32. Chemistry, Botany & EnvironmentalBiology
33. Chemistry, Botany &Microbiology
34. Chemistry, Zoology &Microbiology
35. Chemistry, Industrial Chemistry &Mathematics
36. Chemistry, Industrial Chemistry &Zoology
37. Chemistry, Biochemistry,Botany
38. Chemistry, Biochemistry,Zoology
39. Chemistry, Biochemistry,Microbiology
40. Chemistry, Biotechnology,Botany
41. Chemistry, Biotechnology,Zoology
42. Geology, Chemistry &Geography
43. Geology, Mathematics &Geography
44. Mathematics, Physics &Geography
45. Chemistry, Botany &Geography

(iii) Practical in case prescribed for coresubjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to thateffect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/ group of subjects. In subject/ group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examinationseparately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementaryexamination.

10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.

बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.
भाग – तीन, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा)

पूर्णांक– 75

इकाई–एक **(क)** भारत माता : सुमित्रानंदन पंत

(ख) कथन की शैलियॉ

1. विवरणात्मक शैली
2. मूल्यांकन शैली
3. व्याख्यात्मक शैली
4. विचारात्मक शैली

इकाई–दो **(क)** सूखी डाली : उपेन्द्रनाथ अश्क

(ख) विभिन्न संरचनाएँ

1. विनम्रता सूचक संरचना
2. विधि सूचक संरचना
3. निषेध परक संरचना
4. काल–बोधक संरचना
5. स्थान–बोधक संरचना
6. दिशा बोधक संरचना
7. कार्य–कारण सम्बन्ध संरचना
8. अनुक्रम संरचना

इकाई–तीन **(क)** वसीयत : मालती जोशी

(ख) कार्यालयीन पत्र और आलेख

1. परिपत्र
2. आदेश
3. अधिसूचना
4. ज्ञापन
5. अनुस्मारक
6. पृष्ठाकंन

इकाई–चार **(क)** योग की शक्ति : हरिवंश राय बच्चन

(ख) अनुवाद : स्वरूप एवं परिभाषा, उद्देश्य
स्त्रोत भाषा और लक्ष्य भाषा,
अच्छे अनुवाद की विशेषताएँ,
अनुवाद प्रक्रिया, अनुवादक

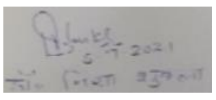
इकाई–पांच **(क)** संस्कृति और राष्ट्रीय एकीकरण : योगेश अटल

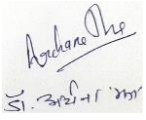
(ख) घटनाओं, समारोहों आदि का प्रतिवेदन, विभिन्न प्रकार के निमंत्रण पत्र

मूल्यांकन योजना : प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरित विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे। इसलिए प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 अंक होंगे। प्रश्नपत्र का पूर्णांक 75 निर्धारित है।

5/7/2024

डॉ आशा दीवान





Foundation Course-III

English Language

B.A./B.Sc./B.Com./B.H.Sc./III

M.M. 75

The question paper for B.A./B.Sc./B.Com./B.H.Sc. III Foundation course, English Language and General Answers shall comprise the following items :

Five question to be attempted, each carrying 3 marks.

UNIT-I	Essay type answer in about 200 words. 5 essay type question to be asked three to be attempted.	15
UNIT-II	Essay writing	10
UNIT-III	Precise writing	10
UNIT-IV (a)	Reading comprehension of an unseen passage	05
(b)	Vocabulary based on text	10
UNIT-V	Grammar Advanced Exercises	25

Note: Question on unit I and IV (b) shall be asked from the prescribed text. Which will comprise of popular create writing and the following items. Minimum needs housing and transport Geo-economic profile of M.P. communication Educate and culture. Women and Worm in Empowerment Development, management of change, physical quality of life. War and human survival, the question of human social value survival, the question of human social value, new Economic Philosophy Recent Diberaliation Method) Demoration decentralization (with reference to 73, 74 constitutional Amendment.

Books Prescribed:

Aspects of English Language and Development - Published by M.P. Hindi Granth Academy, Bhopal.

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

NEW CURRICULUM OF B.Sc. PART III

SESSION 2021-22

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. Each duration and practical work of 180 hrs duration.

Paper – I

INORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

METAL-LIGAND BONDING IN TRANSITION METAL COMPLEXES

(A) Limitations of valence bond theory, Limitation of Crystal Field Theory, Application of CFSE, tetragonal distortions from octahedral geometry, Jahn–Teller distortion, square planar geometry. Qualitative aspect of Ligand field and MO Theory.

(B) Thermodynamic and kinetic aspects of metal complexes. A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes, Trans- effect, theories of trans effect. Mechanism of substitution reactions of square planar complexes.

UNIT-II

MAGNETIC PROPERTIES OF TRANSITION METAL COMPLEXES

Types of magnetic behavior, methods of determining magnetic susceptibility, spin only formula, L-S coupling, correlation of $\mu_{so\ (spin\ only)}$ and $\mu_{eff.}$ values, orbital contribution to magnetic moments, application of magnetic moment data for 3d metal complexes.

Electronic spectra of Transition Metal Complexes.

Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectro-chemical series. Orgel-energy level diagram for d^1 and d^2 states, discussion of the electronic spectrum of $[Ti(H_2O)_6]^{3+}$ complex ion.

UNIT-III

ORGANOMETALLIC CHEMISTRY

Definition and classification of organometallic compounds on the basis of bond type. Concept of hapticity of organic ligands. Metal carbonyls: 18-electron rule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series. General methods of preparation (direct combination, reductive carbonylation, thermal and photochemical decomposition) of mono and binuclear carbonyls of 3d series.

Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT. π-acceptor behavior of CO (MO diagram of CO to be discussed), Zeise's salt: Preparation and structure.

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Catalysis by Organometallic Compounds –

Study of the following industrial processes and their mechanism :

1. Alkene hydrogenation (Wilkinsons Catalyst)
2. Polymeration of ethane using Ziegler – Natta Catalyst

UNIT-IV

BIOINORGANIC CHEMISTRY

Essential and trace elements in biological processes, Excess and deficiency of some trace metals, Toxicity of some metal ions (Hg, Pb, Cd and As), metalloporphyrins with special reference to hemoglobin and myoglobin. Biological role of alkali and alkaline earth metals with special reference to Ca^{2+} and Mg^{2+}, nitrogen fixation.

UNIT-V

HARD AND SOFT ACIDS AND BASES (HSAB) Classification of acids and bases as hard and soft. Pearson's HSAB concept, acid-base strength and hardness and softness. Symbiosis, Applications of HSAB principle.

INORGANIC POLYMERS

Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones. Silicates, phosphazenes and polyphosphate.

REFERENCE BOOKS

1. Basic Inorganic Chemistry, F. A. Cotton, G. Wilkinson and P. L. Gaus, Wiley.
2. Concise Inorganic Chemistry, J. D. Lee, ELBS.
3. Concepts of Models of Inorganic Chemistry, B. Douglas, D. Mc Daniel and J. Alexander, John Wiley.
4. Inorganic Chemistry, D. E. Shriver, P. W. Atkins and C. H. Langford, Oxford.
5. Inorganic Chemistry, W. W. Porterfield, Addison – Wiley.
6. Inorganic Chemistry, A. G. Sharp, ELBS.
7. Inorganic Chemistry, G. L. Miessler and D. A. Tarr, Prentice Hall.
8. Advanced Inorganic Chemistry, Satya Prakash.
9. Advanced Inorganic Chemistry, Agarwal and Agarwal.
10. Advanced Inorganic Chemistry, Puri, Sharma, S. Naginchand.
11. Inorganic Chemistry, Madan, S. Chand.
12. Aadhunik Akarbanic Rasayan, A. K. Shrivastav & P. C. Jain, Goel Pub.
13. Uchchattar Akarbanic Rasayan, satya Prakash & G. D. Tuli, Shyamal Prakashan.
14. Uchchattar Akarbanic Rasayan, Puri & Sharma.
15. Selected topic in Inorganic Chemistry by Madan Malik & Tuli, S. Chand.

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Paper – II
ORGANIC CHEMISTRY 60 Hrs. Max Marks 33

UNIT-I
HETEROCYCLIC COMPOUNDS

Classification and nomenclature, Structure, aromaticity in 5-membered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan, Pyrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Indole (Fischer indole synthesis and Madelung synthesis), Quinoline and isoquinoline, (Skraup synthesis, Friedlander's synthesis, Knorr quinoline synthesis, Doebner- Miller synthesis, Bischler-Napieralski reaction, Pictet- Spengler reaction, Pomeranz-Fritsch reaction).

UNIT II

A. ORGANOMETALLIC REAGENT

Organomagnesium compounds: Grignard reagents formation, structure and chemical reactions.
Organozinc compounds: formation and chemical reactions.
Organolithium compounds: formation and chemical reactions.

B. ORGANIC SYNTHESIS VIA ENOLATES

Active methylene group, alkylation of diethylmalonate and ethyl acetoacetate, Synthesis of ethyl acetoacetate: The Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate. Robbinson annulations reaction.

UNIT-III
BIOMOLECULES

A. CARBOHYDRATES

Occurrence, classification and their biological importance. Monosaccharides: relative and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani Fischer synthesis and Ruff degradation; Disaccharides – Structural comparison of maltose, lactose and sucrose. Polysaccharides – Elementary treatment of starch and cellulose.

B. AMINO ACIDS, PROTEINS AND NUCLEIC ACIDS

Classification and Nomenclature of amino acids, Configuration and acid base properties of amino acids, Isoelectric Point, Peptide bonds, Protein structure, denaturation/ renaturation, Constituents of nucleic acid, DNA, RNA nucleoside, nucleotides, double helical structure of DNA.

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Jagjit Kumar

UNIT-IV

SYNTHETIC POLYMERS

A. Addition or chain growth polymerization, Free radical vinyl polymerization, Ziegler-Natta polymerization, Condensation or Step growth polymerization, polyesters, polyamides, phenols- formaldehyde resins, urea-formaldehyde resins, epoxy resins and polyurethanes, natural and synthetic rubbers.

B. **SYNTHETIC DYES**

Colour and constitution (Electronic Concept). Classification of Dyes. Chemistry of dyes. Chemistry and synthesis of Methyl Orange, Congo Red, Malachite Green, Crystal Violet, phenolphthalein, fluorescein, Alizarine and Indigo.

UNIT-V

A. **INFRA-RED SPECTROSCOPY**

Basic principle, IR absorption Band their position and intensity, IR spectra of organic compounds.

B. **UV-VISIBLE SPECTROSCOPY**

Beer Lambert's law, effect of Conjugation, Types of electronic transitions λ_{max}, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption Visible spectrum and colour.

C. **NMR SPECTROSCOPY**

Basic principles of Proton Magnetic Resonance, Tetramethyl silane (TMS) as internal standard, chemical shift and factors influencing it; Spin – Spin coupling and coupling constant (J); Anisotropic effects in alkene, alkyne, aldehydes and aromatics, Interpretation of NMR spectra of simple organic compounds. ^{13}CMR spectroscopy: Principle and applications.

REFERENCE BOOKS

1. Organic Chemistry, Morrison and Boyd, Prentice-Hall.
2. Organic Chemistry, L. G. Wade Jr. Prentice Hall.
3. Fundamentals of Organic Chemistry, Solomons, John Wiley.
4. Organic Chemistry, Vol I, II, III S. M. Mukherjee, S. P. Singh and R. P. Kapoor, Wiley Easters (New Age).
5. Organic Chemistry, F. A. Carey, McGraw Hill.
6. Introduction to Organic Chemistry, Struiweisser, Heathcock and Kosover, Macmillan.
7. Acheson, R.M. Introduction to the Chemistry of Heterocyclic compounds, John Wiley & Sons (1976).
8. Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
9. McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning IndiaEdition, 2013.
10. Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
11. Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.

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Jagjit Kumar

Paper – III
PHYSICAL CHEMISTRY 60 Hrs., Max Marks 34

UNIT-I

QUANTUM MECHANICS–I

Black-body radiation, Planck's radiation law, photoelectric effect, Compton effect. Operator: Hamiltonian operator, angular momentum operator, Laplacian operator, postulate of quantum mechanics, eigen values, eigen function, Schrodinger time independent wave equation, physical significance of ψ & ψ^2, application of Schrodinger wave equation to particle in a one dimensional box, hydrogen atom (separation into three equations) radial and angular wave functions.

UNIT-II

A. QUANTUM MECHANICS–II

Quantum Mechanical approach of Molecular orbital theory, basic ideas-criteria for forming M.O. and A.O., LCAO approximation, formation of H_2^+ ion, calculation of energy levels from wave functions, bonding and antibonding wave functions, Concept of σ, σ^*, π, π^* orbitals and their characteristics, Hybrid orbitals-sp,sp^2,sp^3 Calculation of coefficients of A.O.'s used in these hybrid orbitals.

Introduction to valence bond model of H_2, comparison of M.O. and V.B. models. Huckel theory, application of Huckel theory to ethene, propene, etc.

UNIT III

SPECTROSCOPY

Introduction: Characterization of Electromagnetic radiation, regions of the spectrum, representation of spectra, width and intensity of spectral transition, Rotational Spectrum of Diatomic molecules. Energy levels of a rigid rotor, selection rules, determination of bond length, qualitative description of non-rigid rotator, isotopic effect.

Vibrational Spectroscopy: Fundamental vibration and their symmetry vibrating diatomic molecules, Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, determination of force constant, anharmonic oscillator

Raman spectrum: Concept of polarizability, quantum theory of Raman spectra, stokes and antistokes lines, pure rotational and pure vibrational Raman spectra. Applications of Raman Spectra.

Electronic Spectroscopy: Basic principles, Electronic Spectra of diatomic molecule, Franck-Condon principle, types of electronic transition, application of electronic spectra.

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UNIT-IV

ELECTROCHEMISTRY-I

A. Electrolytic conductance: Specific and equivalent conductance, measurement of equivalent conductance, effect of dilution on conductance, Kohlrausch law, application of Kohlrausch law in determination of dissociation constant of weak electrolyte, solubility of sparingly soluble electrolyte, absolute velocity of ions, ionic product of water, conductometric titrations.

B. Theories of strong electrolyte: limitations of Ostwald's dilution law, weak and strong electrolytes, Elementary ideas of Debye – Huckel - Onsager's equation for strong electrolytes , relaxation and electrophoretic effects.

C. Migration of ions: Transport number, Determination by Hittorf method and moving boundary method, ionic strength.

UNIT-V

ELECTROCHEMISTRY-II

A. Electrochemical cell and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells, EMF of the cell and effect of temperature on EMF of the cell, Nernst equation Calculation of ΔG, ΔH and ΔS for cell reactions.

B. Single electrode potential : standard hydrogen electrode, calomel electrode, quinhydrone electrode, redox electrodes, electrochemical series

C. Concentration cell with and without transport, liquid - junction potential, application of concentration cells in determining of valency of ions , solubility product and activity coefficient

D. Corrosion-types , theories and prevention

REFERENCE BOOKS

1. Physical chemistry, G.M.Barrow. International Student Edition McGraw Hill.
2. University General Chemistry, CNR Rao, Macmillan.
3. Physical Chemistry R.A.Alberty, Wiley Eastrn.
4. The elements of Physical Chemistry P.W.Alkin,Oxford.
5. Physical Chemistry through problems, S.K.Dogra, Wiley Eastern.
6. Physical Chemistry B.D.Khosla.
7. Physical Chemistry, Puri & Sharma.
8. Bhoutic Rasayan, Puri & Sharma.
9. Bhoutic Rasayan, P.L.Soni.
10. Bhoutic Rasayan, Bahl & Tuli.
11. Physical Chemistry, R.L.Kapoor, Vol- I-IV.
12. Introduction to quantum chemistry,A.K.Chandra,Tata McGraw Hill.
13. Quantum Chemistry,Ira N.Levine, Prentice Hall.

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B.Sc. Part- III

PRACTICAL

Max. Marks-50

INORGANIC CHEMISTRY

Gravimetric analysis:

- Estimation of nickel (II) using Dimethylglyoxime (DMG).
- Estimation of copper as CuSCN
- Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- Estimation of Al (III) by precipitating with oxine and weighing as $Al(oxine)_3$ (aluminium oxinate).
- Estimation of Barium as $BaSO_4$

Inorganic Preparations:

- Tetraamminecopper (II) sulphate, $[Cu(NH_3)_4]SO_4.H_2O$
- Cis and trans $K[Cr(C_2O_4)_2.(H_2O)_2]$ Potassium dioxalatodiaquachromate(III)
- Tetraamminecarbonatocobalt (III) ion
- Potassium tris(oxalate)ferrate(III)/ Sodium tris(oxalate)ferrate(III)
- Cu(I) thiourea complex, Bis (2,4-pentanedionate) zinc hydrate; Double salts (Chrome alum/ Mohr's salt)

ORGANIC CHEMISTRY

1. Preparation of organic Compounds

- Acetylation of one of the following compounds: amines (aniline, o-, m-, p- toluidines and o-,m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid)
- Benzolyation of one of the following amines (aniline, o-, m-, p- toluidines and o-, m-, panisidine) and one of the following phenols (β-naphthol, resorcinol, p cresol) by Schotten-Baumann reaction.
- Bromination of any one of the following: a. Acetanilide by conventional methods b.Acetanilide using green approach (Bromate-bromide method)
- Nitration of any one of the following: a. Acetanilide/nitrobenzene by conventional method b. Salicylic acid by green approach (using ceric ammonium nitrate).
- Reduction of p-nitrobenzaldehyde by sodium borohydride.
- Hydrolysis of amides and esters.
- Semicarbazone of any one of the following compounds: acetone, ethyl methyl ketone, cyclohexanone, benzaldehyde.
- Benzylisothiouronium salt of one each of water soluble and water insoluble acids (benzoic acid, oxalic acid, phenyl acetic acid and phthalic acid).
- Aldol condensation using either conventional or green method.

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- Benzil-Benzilic acid rearrangement.
- Preparation of sodium polyacrylate.
- Preparation of urea formaldehyde.
- Preparation of methyl orange.

The above derivatives should be prepared using 0.5-1g of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC.

2. Qualitative Analysis Analysis of an organic mixture containing two solid components using water, $NaHCO_3$, NaOH for separation and preparation of suitable derivatives.
3. Extraction of caffeine from tea leaves.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy. (Spectra to be provided).
6. Estimation of glycine by Sorenson's formalin method.
7. Study of the titration curve of glycine.
8. Estimation of proteins by Lowry's method.
9. Study of the action of salivary amylase on starch at optimum conditions.
10. Effect of temperature on the action of salivary amylase.

PHYSICAL CHEMISTRY

Conductometry

- Determination of cell constant
- Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- Perform the following conductometric titrations:
    i. Strong acid vs. strong base
    ii. Weak acid vs. strong base
    iii. Mixture of strong acid and weak acid vs. strong base
    iv. Strong acid vs. weak base
- To determine the strength of the given acid conductometrically using standard alkali solution.
- To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically
- To study the saponification of ethyl acetate conductometrically.

Potentiometry/pH metry

Perform the following potentio/pH metric titrations:
i. Strong acid vs. strong base
ii. Weak acid vs. strong base
iii. Dibasic acid vs. strong base
iv. Potassium dichromate vs. Mohr's salt
v. Determination of pKa of monobasic acid

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UV/ Visible spectroscopy

- Verify Lambert-Beer's law and determine the concentration of $CuSO_4$/$KMnO_4$/$K_2Cr_2O_7$ in a solution of unknown concentration
- Determine the concentrations of $KMnO_4$ and $K_2Cr_2O_7$ in a mixture.
- Study the kinetics of iodination of propanone in acidic medium.
- Determine the amount of iron present in a sample using 1,10-phenathroline.
- Determine the dissociation constant of an indicator (phenolphthalein).
- Study the kinetics of interaction of crystal violet/ phenolphthalein with sodium hydroxide.
- Study of pH-dependence of the UV-Vis spectrum (200-500 nm) of potassium dichromate.
- Spectral characteristics study (UV) of given compounds (acetone, acelaldehyde, acetic acid, etc.) in water.
- Absorption spectra of $KMnO_4$ and $K_2Cr_2O_7$ (in 0.1 M H_2SO_4) and determine λ_{max} values.

Note: **Experiments may be added/deleted subject to availability of time and facilities**

REFERENCE BOOKS:

1. Vogel, A.I. Quantitative Organic Analysis, Part 3, Pearson (2012).31
2. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
3. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
4. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
5. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000)
6. Manual of Biochemistry Workshop, 2012, Department of Chemistry, University of Delhi.

28.06.21 (Dr. Alka Tiwari) | 28.06.2021 (Dr. C. Bose) | 28.06.2021 (Dr. Rajmani Patel) | 28.6.2021 | 28.06.2021 Jagjit Kumar

8 Hrs. **PRACTICAL EXAMINATION** **M.M.50**

Five experiments are to be performed.

1. **Inorganic** - Two experiments to be performed.
   - Gravimetric estimation compulsory **08 marks**. (Manipulation 3 marks)
   - Anyone experiment from synthesis and analysis **04 marks**.

2. **Organic -** Two experiments to be performed.
   - Qualitative analysis of organic mixture containing two solid components. Compulsory carrying **08 marks** (03 marks for each compound and two marks for Separation).
   - One experiment from synthesis of organic compound (Single step) **04 marks**.

3. Physical-One physical experiment **12 marks**.
4. Sessional **04 marks**.
5. Viva Voce **10 marks**.

In case of Ex-Students one mark each will be added to Gravimetric analysis and Qualitative analysis of organic mixture and two marks in Physical experiment.

28.06.21
(Dr. Alka Tiwari)

28.06.2021
(Dr. C. Bose)

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(Dr. Rajmani Patel)

28.6.2021

28.06.2021
Jagjit Kumar

Session 2021-22
PHYSICS

OBJECTIVES OF THE COURSE

The undergraduate training in physics is aimed at providing the necessary inputs so as to set forth the task of bringing about new and innovative ideas/concepts so that the formulated model curricula in physics becomes in tune with the changing scenario and incorporate new and rapid advancements and multi-disciplinary skills, societal relevance, global interface, self-sustaining and supportive learning.

It is desired that undergraduate i.e. B.Sc. level besides grasping the basic concepts of physics should in addition have broader vision. Therefore, they should be exposed to societal interface of physics and role of physics in the development of technologies.

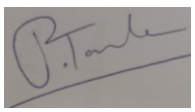
EXAMINATION SCHEME:

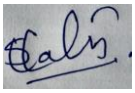
1. There shall be 2 theory papers of 3 hours duration each and one practical paper of 4 hours duration. Each paper shall carry 50 marks.
2. Numerical problems of at least 30% will compulsorily be asked in each theory paper.
3. In practical paper, each student has to perform two experiments one from each groups as listed in the list of experiments.
4. Practical examination will be of 4 hours duration- one experiment to be completed in 2 hours.

   The distribution practical marks as follows:

Experiment	:	15+15=30
Viva voce	:	10
Internal assessment	:	10
5. The external examiner should ensure that at least 16 experiments are in working order at the time of examination and submit a certificate to this effect.







B.Sc. Part-III

Paper-I

RELATIVITY, QUANTUM MECHANICS, ATOMIC MOLECULAR AND NUCLEAR PHYSICS

Unit-1 Reference systems, inertial frames, Galilean invariance propagation of light, Michelson-Morley experiment, search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass.

Unit-2 Origin of the quantum theory : Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect, Compton effect, Wave-particle duality, uncertainty principle, de Broglie's hypothesis for matter waves, the concept of Phase and group velocities, experimental demonstration of mater waves. Davisson and Germer's experiment. Consequence of de Broglie's concepts, Bohr's complementary Principle, Bohr's correspondence principle, Bohr's atomic model, energies of a particle in a box, wave packets. Consequence of the uncertainty relation, gamma ray microscope, diffraction at a slit.

Unit-3 Quantum Mechanics: Schrodinger's equation, Statistical interpretation of wave function, Orthogonality and normalization of wave function, Probability current density, Postulatory basis of quantum mechanics, operators, expectation values, Ehrenfest's theorem, transition probabilities, applications to particle in a one and three dimensional boxes, harmonic oscillator in one dimension, reflection at a step potential, transmission across a potential barrier.

Unit-4 Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure, screening constants for alkali spectra for s, p, d and f states, selection rules. Discrete set of electronic energies of moleculers, quantisation of vibrational and rotational energies, determination of inter-nuclear distance, pure rotational and rotation vibration spectra. Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.

Unit-5 Structure of nuclei:- Basic Properties of Nuclei: (1) Mass, (2) Radii, (3) Charge, (4) Angular Momentum, (5) Spin, (6) Magnetic Moment (μ), (7) Stability and (8) Binding Energy, Nuclear Models:- Liquid Drop Model, Mass formula, Shell Model, Types of Nuclear reactions, laws of conservation, Q-value of reactions, Interaction of Energetic particles with matter, Ionization chamber, GM Counter, Cloud Chambers, Fundamental Interactions, Classification of Elementary Particles, Particles and Antiparticles, Baryons, Hyperons, Leptons, and Mesons, Elementary Particle Quantum Numbers: Baryon Number, Lepton Number, Strangeness, Electric Charge, Hypercharge and Isospin, introductory idea of discovery of Higg's Boson.

TEXT AND REFERENCE BOOKS:

1. H.S. Mani and G.K. Metha: "Introduction to Modern Physics"" (Affiliated East-West Press, 1989).
2. A Beiser, "Prospective of Modern Physics".
3. H.E. White, Introduction to Atomic Physics".
4. Barrow, "Introduction to Molecular Physics".
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).
6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay, 1988).
10. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi, 1984.
11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
12. Theoretical Nuclear Physics, J.M. Blatt & V.F.Weisskopf (Dover Pub.Inc., 1991).
13. Electronic Devices & Circuits By Milliman Helkiyan.

Paper-II

SOLID STATE PHYSICS, SOLID STATE DEVICES AND ELECTRONICS

Unit-1 Amorphous and crystalline solids, Elements of symmetry, seven crystal system, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law, Bonding in solids, classification. Cohesive energy of solid, Madelung constant, evaluation of Parameters, Specific heat of solids, classical theory (Dulong-Petit's law), Einstein and Debye theories, Vibrational modes of one dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.

Unit-2 Free electron model of a metal, Solution of one dimensional Schrödinger equation in a constant potential, Density of states, Fermi Energy, Energy bands in a solid (Kronig-Penny model without mathematical details), Difference between Metals, Insulator and Semiconductors, Hall effect, Dia, Para and Ferromagnetism, Langevin's theory of dia and para-magnetism, Curie- Weiss's Law, Qualitative description of Ferromagnetism (Magnetic domains), B-H curve and Hysteresis loss.

Unit-3 Intrinsic and extrinsic semiconductors, Concept of Fermi level, Generation and recombination of electron hole pairs in semiconductors, Mobility of electrons and holes, drift and diffusion currents, p-n junction diode, depletion width and potential barrier, junction capacitance, I-V characteristics, Tunnel diode, Zener diode, Light emitting diode, solar cell, Bipolar transistors, pnp and npn transistors, characteristics of transistors, different configurations, current amplification factor, FET and MOSFET Characteristics.

Unit-4 Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters, Inductor filter, L and π section filters, Zener diode, regulated power supply using zener diode, Applications of transistors, Bipolar Transistor as amplifier, h-parameter, h-parameter equivalent circuit, Transistor as power amplifier, Transistor as oscillator, principle of an oscillator and Bark Hausen's condition, requirements of an oscillator, Wein-Bridge oscillator and Hartley oscillator.

Unit-5 Digital Circuits: Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gate, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuit using Boolean Algebra, Digital to Analog Converter, Analog to Digital Converter.

TEXT AND REFERENCE BOOKS:

1. Introduction to solid state physics: C. Kittel.
2. Solid State Physics: A.J. Dekkar.
3. Electronic Circuits: Mottershead.
4. Electronic Circuits: Millman and Halkias.
5. Semiconductor Devices: S.M. Sze.
6. Electronic devices: T.L. Floyd.
7. Device and Circuits: J. Millman and C. Halkias.
8. Electronic Fundamental and Applications: D. Chatopadhyay and P.C. Rakshit.
9. Electricity and Magnetism: K.K. Tiwari.

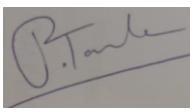
PRACTICALS

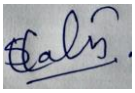
Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Determination of Planck's constant.
2. Determination of e/m by using Thomson tube.
3. Determination of e by Millikan's methods.
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses of electron proton).
5. Absorption spectrum of iodine vapour.
6. Study of alkali or alkaline earth spectra using a concave grating.
7. Study of Zeeman effect for determination of a Lande g-factor.
8. Analysis of a given band spectrum.
9. Study of Raman spectrum using laser as an excitation source.
10. Study of absorption of alpha and beta rays.
11. Study of statistics in radioactive measurement.
12. Coniometric study of crystal faces.
13. Determination of dielectric constant.
14. Hysteresis curve of transformer core.
15. Hall-probe method for measurement of magnetic field.
16. Specific resistance and energy gap of semiconductor.
17. Characteristics of transistor.
18. Characteristics of tunnel diode.
19. Study of voltage regulation system.
20. Study of regulated power supply.
21. Study of lissajous figures using CRO.
22. Study of VTVM.
23. Study of RC and TC coupled amplifiers.
24. Study of AF and RF oscillators.
25. Find roots of f(x) = 0 by using Newton-Raphson Method.





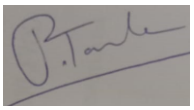


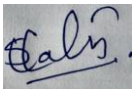
26. Find root of f(x) = 0 by using secant method.
27. Integration by Simpson rule.
28. To find the value of V at
29. String manipulations.
30. Towers of Hanoi (Non-recursive).
31. Finding first four perfect numbers.
32. Quadratic interpolation using Newton's forward-difference formula of degree two.

TEXT AND REFERENCE BOOKS:

1. B.G. Strechman, Solid state electronics devices II edition (Prentice-Hall of India New Delhi 1986)
2. W.D. Stanley, Electronics devices, circuits and applications (Prentice-Hall new jersey, USA 1988).
3. S. Lipschutz and A Poe; Schaum's outline of theory and problems of programming with Fortran (Mc Graw-Hill Book Co. Singapore, 1986).
4. C Dixon, Numerical Analysis.







MATHEMATICS

There shall be three theory papers. Two compulsory and one optional. Each paper carrying 50 marks is divided into five units and each unit carry equal marks.

B.A./B.SC. Part-III

PAPER - I
ANALYSIS

METRIC SPACES

UNIT-I Definition and examples of metric spaces. Neighbourhoods, Limit points, Interior points, Open and Closed sets, Closure and interior. Boundary points, Sub-space of a metric space. Cauchy sequences, Completeness, Cantor's intersection theorem. Contraction principle, construction of real numbers as the completion of the incomplete metric space of rationals. Real numbers as a complete ordered field.

UNIT-II Dense subsets. Baire Category theorem. Separable, second countable and first countable spaces. Continuous functions. Extension theorem. Uniform continuity, isometry and homeomorphism. Equivalent metrics. Compactness, sequential compactness. Totally bounded spaces. Finite intersection property. Continuous functions and Compact sets, Connectedness, Components, Continuous functions and Connected sets.

COMPLEX ANALYSIS

UNIT-III Complex numbers as ordered pairs. Geometrical representation of complex numbers. Stereographic projection. Continuity and differentiability of complex functions. Analytic functions. Cauchy-Riemann equations. Harmonic functions. Elementary functions. Mapping by elementary functions. Mobius transformations. Fixed points, Cross ratio. Inverse points and critical mappings. Conformal mappings.

REAL ANALYSIS

UNIT-IV Series of arbitrary terms. Convergence, divergence and oscillation. Abel's and Dirichlet's test. Multiplication of series. Double series. Partial derivation and differentiability of real-valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Fourier series. Fourier expansion of piecewise monotonic functions.

UNIT-V Riemann integral. Intergrability of continuous and monotonic functions. The fundamental theorem of integral calculus. Mean value theorems of integral calculus. Improper integrals and their convergence. Comparison tests. Abel's and Dirichlet' tests. Frullani's integral. Integral as a function of a parameter. Continuity, derivability and integrability of an integral of a function of a parameter.

REFERENCES :

1. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
2. R.R. Goldberg, Real Analysis, Oxford & IBH publishing Co., New Delhi, 1970.
3. S. Lang, Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. D. Somasundaram and B. Choudhary, A First Coarse in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. Shanti Narayan, A Course of Mathematical Analysis, S. Chand & Co. New Delhi.
6. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
7. R.V. Churchill and J.W. Brown, Complex Variables and Applications, 5th Edition, McGraw- Hill, NewYork, 1990.
8. Mark J. Ablowitz and A.S. Fokas, Complex Variables : Introduction and Applications, Cambridge University Press, South Asian Edition, 1998.
9. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
10. E.T. Copson, Metric Spaces, Cambridge University Press, 1968.
11. P.K. Jain and K. Ahmad, Metric Spaces, Narosa Publishing House, New Delhi, 1996.
12. G.F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 1963.

Dr. Shabnam Khan. (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

B.A./B.SC. Part-III

PART - II
ABSTRACT ALGEBRA

UNIT-I Group- Automorphisms, inner automorphism. Automorphism of groups and their computations, Conjugacy relation, Normaliser, Counting principle and the class equation of a finite group. Center for Group of prime-order, Abelianizing of a group and its universal property. Sylow's theorems, Sylow subgroup, Structure theorem for finite Abelian groups.

UNIT-II Ring theory-Ring homomorphism. Ideals and quotient rings. Field of quotients of an integral domain, Euclidean rings, polynomial rings, Polynomials over the rational field. The Eisenstien criterion, polynomial rings over commutative rings, Unique factorization domain. R unique factorisation domain implies so is $R[x_1, x_2 ..... x_n]$. Modules, Submodules, Quotient modules, Homomorphism and Isomorphism theorems.

UNIT-III Definition and examples of vector spaces. Subspaces. Sum and direct sum of subspaces. Linear span, Linear dependence, independence and their basic properties. Basis. Finite dimensional vector spaces. Existence theorem for bases. Invariance of the number of elements of a basis set. Dimension. Existence of complementary subspace of a finite dimensional vector space. Dimension of sums of subspaces. Quotient space and its dimension.

UNIT-IV Linear transformations and their representation as matrices. The Algebra of linear transformations. The rank nullity theorem. Change of basis. Dual space. Bidual space and natural isomorphism. Adjoint of a linear transformation. Eigenvalues and eigenvectors of a linear transformation. Diagonalisation. Annihilator of a subspace. Bilinear, Quadratic and Hermitian forms.

UNIT-V Inner Product Spaces-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements. Orthonormal sets and bases. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.

REFERENCES :

1. I.N. Herstein, Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975.
2. N. Jacobson, Basic Algebra, Vols. I & II. W.H. Freeman, 1980 (also published by Hindustan Publishing Company).
3. Shanti Narayan, A Text Book of Modern Abstract Algebra, S.Chand & Co. New Delhi.
4. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
5. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal, Basic Abstract Algebra (2"" Edition) Cambridge University Press, Indian Edition, 1997.
6. K. Hoffman and R. Kunze, Linear Algebra, (2nd Edition), Prentice Hall. Englewood Cliffs, New Jersey, 1971.
7. S.K. Jain, A. Gunawardena and P.B. Bhattacharya, Basic Linear Algebra with MATLAB. Key College Publishing (Springer-Verlag) 2001.
8. S. Kumaresan, Linear Algebra, A Geometric Approach, Prentice-Hall of India, 2000.
9. Vivek Sahai and Vikas Bist, Algebra, Norosa Publishing House, 1997.
10. I.S. Luther and I.B.S.Passi, Algebra, Vol. I-Groups, Vol. II-Rings. Narosa Publishing House (Vol. I-1996, Vol. II-1999)
11. D.S. Malik, J.N. Mordeson, and M.K. Sen, Fundamentals of Abstract Algebra, McGraw- Hill International Edition, 1997.

Dr. Shabnam Khan. (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

B.A./B.SC. Part-III

PAPER - III - (OPTIONAL)

(I) PRINCIPLES OF COMPUTER SCIENCE

UNIT-I **Data Storage** - Storage of bits. Main Memory. Mass Storage. Coding Information of Storage. The Binary System. Storing integers, storing fractions, communication errors.
Data Manipulation - The Central Processing Unit. The Stored-Program Concept. Programme Execution. Other Architectures. Arithmetic/Logic Instructions. Computer- Peripheral Communication.

UNIT-II **Operating System and Networks** - The Evolution of Operating System. Operating System Architecture. Coordinating the Machine's Activities. Handling Competition Among Process. Networks. Networks Protocol.
Software Engineering - The Software Engineering Discipline. The Software Life Cycle. Modularity. Development Tools and Techniques. Documentation. Software Ownership and Liability.

UNIT-III **Algorithms** - The Concept of an Algorithm, Algorithm Representation. Algorithm Discovery. Iterative Structures. Recursive Structures. Efficiency and Correctness. (Algorithms to be implemented in C++).
Programming Languages - Historical Perspective. Traditional Programming Concepts, Program Units. Language Implementation. Parallel Computing. Declarative Computing.

UNIT-IV **Data Structures** - Arrays. Lists. Stacks. Queues. Trees. Customised Data Types. Object Oriented Programming.
File Structure - Sequential Files. Text Files. Indexed Files. Hashed Files. The Role of the Operating System.
Database Structure - General Issues. The Layered Approach to Database Implementation. The Relational Model. Object-Oriented Database. Maintaining Database Integrity. E-R models

UNIT-V **Artifical Intelligence** - Some Philosophical Issues. Image Analysis. Reasoning, Control System Activities. Using Heuristics. Artificial Neural Networks. Application of Artificial Intelligence.
Theory of Computation - Turning Machines. Computable functions. A Non computable Function. Complexity and its Measures. Problem Classification.

REFERENCES :

1. J. Glen Brookshear, Computer Science : An Overview, Addition -Wesley.
2. Stanley B. Lippman, Josee Lojoie, C++ Primer (3rd Edition), Addison-Wesley.

Padmavali Dr. Shabnam Khan. Neelam Sharma (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

B.A./B.SC. Part-III

PAPER - III - (OPTIONAL)

(II) DISCRETE MATHEMATICS

UNIT-I **Sets and Propositions -** Cardinality. Mathematical Induction, Principle of inclusion and exclusion. **Computability and Formal Languages -** Ordered Sets. Languages. Phrase Structure Grammars. Types of Grammars and Languages. Permutations. Combinations and Discrete Probability.

UNIT-II **Relations and Functions -** Binary Relations, Equivalence Relations and Partitions. Partial Order Relations and Lattices. Chains and Antichains. Pigeon Hole Principle.

Graphs and Planar Graphs - Basic Terminology. Multigraphs. Weighted Graphs. Paths and Circuits. Shortest Paths. Eulerian Paths and Circuits. Travelling Salesman Problem. Planner Graphs. Trees.

UNIT-III **Finite State Machines -** Equivalent Machines. Finite State Machines as Language Recognizers. **Analysis of Algorithms -** Time Complexity. Complexity of Problems. Discrete Numeric Functions and Generating Functions.

UNIT-IV **Recurrence Relations and Recursive Algorithms -** Linear Recurrence Relations with constant coefficients. Homogeneous Solutions. Particular Solution. Total Solution. Solution by the Method of Generating Functions. Brief review of Groups and Rings.

UNIT-V **Boolean Algebras -** Lattices and Algebraic Structures. Duality, Distributive and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Expressions. Prepositional Calculus. Design and Implementation of Digital Networks. Switching Circuits.

REFERENCES :

1. C.L. Liu, Elements of Discrete Mathematics, (Second Edition), McGraw Hill, International Edition, Computer Science Series, 1986

Padmavali Dr. Shabnam Khan. Neelam Sharma (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

B.A./B.SC. Part-III

PAPER - III - (OPTIONAL)

(III) PROGRAMMING IN C AND NUMERICAL ANALYSIS

(Theory & Practical)

Theory component will have maximum marks 30.

Practical component will have maximum marks 20.

UNIT-I Programmer's model of a computer. Algorithms. Flow Charts. Data Types. Arithmetic and input/output instructions. Decisions control structures. Decision statements. Logical and Conditional operators. Loop. Case control structures. Functions. Recursions. Preprocessors. Arrays. Puppetting of strings. Structures. Pointers. File formatting.

Numerical Analysis

UNIT-II **Solution of Equations:** Bisection, Secant, Regula Falsi, Newton's Method, Roots of Polynomials. **Interpolation:** Lagrange and Hermite Interpolation, Divided Differences, Difference Schemes, Interpolation Formulas using Differences. Numerical Differentiation. Numerical Quadrature: Newton-Cote's Formulas. Gauss Quadrature Formulas, Chebychev's Formulas.

UNIT-III **Linear Equations:** Direct Methods for Solving Systems of Linear Equations (Guass Elimination, LU Decomposition, Cholesky Decomposition), Iterative Methods (Jacobi, GaussSeidel, Relaxation Methods).

The Algebraic Eigenvalue problem: Jacobi's Method, Givens' Method, Householder's Method, Power Method, QR Method, Lanczos' Method.

UNIT-IV **Ordinary Differential Equations:** Euler Method, Single-step Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method, Methods Based on Numerical Integration, Methods Based on Numerical Differentiation, Boundary Value Problems, Eigenvalue Problems.

Approximation: Different Types of Approximation, Least Square Polynomial Approximation, Polynomial Approximation using Orthogonal Polynomials, Approximation with Trigonometric Functions, Exponential Functions, Chebychev Polynomials, Rational Functions.

Monte Carlo Methods

Unit-V Random number generation, congruential generators, statistical tests of pseudo-random numbers. Random variate generation, inverse transform method, composition method, acceptance rejection method, generation of exponential, normal variates, binomial and Poisson variates.

Monte Carlo integration, hit or miss Monte Carlo integration, Monte Carlo integration for improper integrals, error analysis for Monte Carlo integration.

REFERENCES :

1. Henry Mullish and Herbert L. Cooper, Spirit of C: An Introduction to Modern Programming, Jaico Publishers, Bombay.
2. B.W. Kernighan and D.M. Ritchie. The C Programming Language 2nd Edition, (ANSI features) Prentice Hall, 1989.
3. Peter A Darnel and Philip E. Margolis, C : A Software Engineering Approach, Narosa Publishing House, 1993.
4. Robert C. Hutehisonand Steven B. Just, Programming using C Language, McGraw Hill, 1988.
5. Les Hancock and Morris Krieger, The C Primer, McGraw Hill, 1988.
6. V. Rajaraman, Programming in C, Prentice Hall of India, 1994.
7. Byron S. Gottfried, Theory and Problems of Programming with C, Tata McGraw-Hill Publishing Co. Ltd., 1998.
8. C.E. Froberg, Introduction to Numerical Analysis, (Second Edition), Addison-Wesley, 1979.
9. James B. Scarborough, Numerical Mathematical Analysis, Oxford and IBHPublishing Co. Pvt. Ltd. 1966.
10. Melvin J. Maron, Numerical Analysis A Practical Approach, Macmillan publishing Co., Inc. New York, 1982.
11. M.K. Jain, S.R.K. lyengar, R.K. Jain, Numerical Methods Problems and Solutions, New Age International (P) Ltd., 1996.

Dr. Shabnam Khan. (Dr. Rakesh Tiwari) (Dr. Asha Rani Das)

12. M.K. Jain, S.R.K. lyengar, R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International (P) Ltd., 1999.
13. R.Y. Rubistein, Simulation and the Monte Carlo Methods, John Wiley, 1981.
14. D.J. Yakowitz, Computational Probability and Simulation, Addison-Wesley, 1977.

PAPER - III - (OPTIONAL)
(IV) PRACTICAL
PROGRAMMING IN C AND NUMERICAL ANALYSIS

LIST OF PRACTICAL TO BE CONDUCTED...

1. Write a program in C to find out the largest number of three integer numbers.
2. Write a program in C to accept monthly salary from the user, find and display income tax with the help of following rules :

Monthly Salary	Income Tax
9000 or more	40% of monthly salary
7500 or more	30% of monthly salary
7499 or less	20% of monthly salary

3. Write a program in C that reads a year and determine whether it is a leap year or not.
4. Write a program in C to calculate and print the first n terms of fibonacci series using looping statement.
5. Write a program in C that reads in a number and single digit. It determines whether the first number contains the digit or not.
6. Write a program in C to computes the roots of a quadratic equation using case statement.
7. Write a program in C to find out the largest number of four numbers using function.
8. Write a program in C to find the sum of all the digits of a given number using recursion.
9. Write a program in C to calculate the factorial of a given number using recursion.
10. Write a program in C to calculate and print the multiplication of given 2D matrices.
11. Write a program in C to check that whether given string palindrome or not.
12. Write a Program in C to calculate the sum of series:

$$1 + x + \frac{1}{2!}x^2 + \frac{1}{3!}x^3 + \ldots\ldots + \frac{1}{n!}x^n$$

13. Write a program in C to determine the grade of all students in the class using Structure. Where structure having following members - name, age, roll, sub1, sub2, sub3, sub4 and total.
14. Write a program in C to copy one string to another using pointer. (Without using standard library functions).
15. Write a program in C to store the data of five students permanently in a data file using file handling.

Padmavali Dr. Shabnam Khan. Neelam Sharma (Dr. Rakesh Tiwari) (Dr. Asha Rani Das) Dr. Rajni Verma

B.SC.-III

PAPER- I (BOTANY)

(ANALYTICAL TECHNOLOGY PLANT PATHOLOGY, EXPERIMENTAL EMBRYOLOGY, ELEMENTARY BIOSTATISTICS, ENVIRONMENTAL POLLUTION AND CONSERVATION)

UNIT-I

Structure, Principle and applications of analytical instrumentation.

Chromatography technique, Oven, Incubator, Autoclave, Centrifuge, Spectrophotometere

UNIT-II

Plant Tissue culture techniques, growth media, totipotency, protoplast culture, somatic hybrids and cybrids, micropropagation, somaclonal variations, haploid culture.

Analytical techniques: Microscopy-Light microscope, Electron microscope

UNIT-III

General principles of plant pathology, general symptoms of fungal, bacterial and viral diseases, mode of infection] diseases resistance and control measures, plant quarantine. A study of epidemiology and etiology of following plant diseases.

Rust diseases of wheat, Tikka diseases of groung nut, Red rot of sugar can, Bacterial blight of rice, yellow vein mosaic of b hindi, Little Leaf of brinjal.

UNIT-IV

Introduction to pollution, green house gases, Ozone depletion, Dissolve oxygen, B.O.D., C.O.D.

Bio magnification, Eutrophication, Acid precipitation, Pytoremediation. Plant indicators, Biogeographical Zones of India, Concept of Biodiversity, CBD, MAB, National parks and biodiversity Hot spots, Conservation strategies, Red Data Book, IUCN threat categories, invasive species, endemic species. concept of sustainable development.

UNIT-V

ELEMENTARY BIOSTATISTICS:

Introduction and application of Biostatics, measure of central tendency-Mean, Median, Mode, measures of dispersal-Standard deviation, standard error.

Books Recommended:

Singh, RS, **Plant Diseases,** Oxford & IBH, New Delhi.

Pandey,BP, **Plant Pathology,** S. Chand Publishing, New Delhi

Sharma, PD, **Microbiology and Plant pathology,** Rastogi Publications, Meerut

Sharma PD, **Mycology and Phytopathology,** Rastogi Publications, Meerut

Singh JS, Singh SP and Gupta, SR, **Ecology Environmental Science and Conservation,** S. Chand Publishing, New Delhi

Sharma, PD. **Ecology and Environment,** Rastogi Publications, Meerut

Bhojwani, SS and Razdan, MK, **Plant Tissue Culture: Theory and Practices,** Elsevier

Sharma AK, **Text book of Biostatistics,** Discovery Publishing House Pvt.Ltd.

B.SC.-III

PAPER- II (BOTANY)

(GENETICS, MOLECULAR BIOLOGY, BIOTECHNOLOGY AND BIOCHEMISTRY)

UNIT-I

Cell and cell organelles, organization and morphology of chromosomes, giant chromosomes, cell division, Mendel's laws, gene interactions, linkage and crossing over, chromosomal aberration, polyploidy, sex linked inheritance, sex determination, cytolasmic inheritance, gene concept: cistron muton, recon.

UNIT- II

Nucleic acids, Structure and forms of DNA and RNA, DNA/RNA as genetic material, replication of DNA, biochemical and molecular basis of mutation, genetic code and its properties, mechanism of transcription and translation in prokaryotes, regulation of gene expression, Operon model.

UNIT- III

Recombinant DNA, Enzymes in recombinant DNA technology, cloning vectors (Plasmid, Bacteriophages, Cosmids, Phagemids), gene cloning, PCR, Application of Biotechnology; G.M.Plants, Monoclonal antibodies, DNA finger printing

UNIT- IV

Protein: Chemical composition, primary, secondary and tertiary structure of Proteins.

Carbohydrate: general account of monosaccharides, disaccharids and Polsaccharides

Fat: Structure and properties of fats and fatty acids, synthesis and breakdown.

UNIT- V

ENZYMES: Nomenclature and classifaction, components of enzymes, theories of enzyme action, enzyme kinetics (Michaelis-Menten constant), allosteric enzymes, isozymes, Abzymes. Ribozymes, factors affecting enzyme activity.

Books Recommended:

Nelson, DL, Cox, MM, Lehninger Principles of Biochemistry, W.H. freeman and Company, New York, USA.

Cooper, GM, The Cell: A Molecular Approach, ASM Press & Sunderland, Washington, D.C. Sinauer Associates, MA.

Singh BD, Fundamental of Genetics, Kalyani Publication

Singh BD, Genetics, Kalyani Publication

Gupta, PK, Cell and Molecular Biology, Rastogi Publications, Meerut

Singh, BD, Biotechnology: Expanding Horizons, Kalyani Publications

Gupta, PK, Elements of Plant Biotechnology, Rastogi Publications, Meerut

Gupta, SN, concepts of Biochemistry, Rastogi Publications, Meeru

Jain, JL, Jain S, Jain, N, Fundamentals of Biochemistry, S Chand Publishing, New Delhi

B.Sc.- III (Botany)

Practical

1. Study of host parasite relationship pf plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques

PRACTICAL SCHEME

TIME: 4 Hrs.	**M.M.: 50**
1. Plant Disease/Symptoms	10
2. Instrumentation techniques	05
3. Staining of Microbes	05
4. Tissue Culture techniques	05
5. Spotting	10
6. Project Work/ Field Study	05
7. Viva-Voce	05
8. Sessional	05

Hemchand Yadav Vishwavidyala, Durg (C.G.)

Zoology

B.Sc. Part III **(2021-22)**

Paper-I

ECOLOGY, ENVIRONMENTAL BIOLOGY: TOXICOLOGY, MICROBIOLOGY AND MEDICAL ZOOLOGY

Unit: I (Ecology)

- Aims and scopes of ecology
- Major ecosystems of the world-Brief introduction
- Population- Characteristics and regulation of densities
- Communities and ecosystem
- Bio-geo chemical cycles
- Air & water pollution
- Ecological succession

Unit: II (Environmental Biology)

- Laws of limiting factor
- Food chain in fresh water ecosystem
- Energy flow in ecosystem- Trophic levels
- Conservation of natural resources
- Environmental impact assessment

Unit: III (Toxicology)

- Definition and classification of Toxicants
- Basic Concept of toxicology
- Principal of systematic toxicology
- Heavy metal Toxicity (Arsenic, Murcury, Lead, Cadmium)
- Animal poisons- snake venom, scorpion & bee poisoning
- Food poisoning

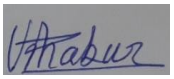
Unit: IV (Microbiology)

- General and applied microbiology
- Microbiology of domestic water and sewage
- Microbiology of milk & milk products
- Industrial microbiology: fermentation process, production of penicillin, alcoholic breverages, bioleaching.

Unit:V (Medical Zoology)

- Brief introduction to pathogenic microorganisms, Ricketssia, Spirochaetes, AIDS and Typhoid
- Brief account of life history & pathogenicity of the following pathogens with reference to man: prophylaxis & treatment
- Pathogenic protozoan's- Entamoeba, Trypanosome & Plasmodium
- Pathogenic helminthes- Schistosoma
- Nematode pathogenic parasites of man
- Vector insects

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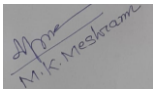
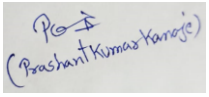
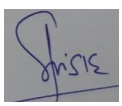



Dr. Sanjay Thite

Zoology
B.Sc. Part III (2021-22)
Paper II

GENETICS, CELL PHYSIOLOGY, BIOCHEMISTRY, BIOTECHNOLOGY AND BIOTECHNIQUES

Unit: I (Genetics)

- Linkage & linkage maps, Sex Determination and Sex Linkage
- Gene interaction- Incomplete dominance & Codominance, Supplementary gene, Complementary gene, Epistasis Lethal gene, Pleiotropic gene and multiple alleles.
- Mutation: Gene and chromosomal mutation
- Human genetics: chromosomal alteration: Down, Edward, Patau, Turner and Klinefelter Syndrome Single gene disorders: Alkaptonuria, Phenylketonuria, Sickle cell anemia, albinism and colour blindness

Unit: II (Cell Physiology)

- General idea about pH & buffer
- Transport across membrane: Diffusion and Osmosis
- Active transport in mitochondria & endoplasmic reticulum
- Enzymes-classification and Action

Unit: III (Biochemistry)

- Amino acids & peptides- Basic structure & biological function
- Carbohydrates & its metabolism- Glycogenesis; Gluconeogenesis; Glycolysis; Glycogenolysis; Cosi-cycle
- Lipid metabolism- Oxidation of glycerol; Oxidation of fatty acids
- Protein Catabolism- Deamination, transamination, transmethylation

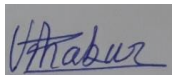
Unit: IV (Biotechnology)

- Application of Biotechnology
- Recombinant DNA & Gene cloning
- Cloned genes & other tools of biotechnology (Tissue culture, Hybridoma, Trasgenic Animals and Gene library)

Unit: V (Biotechniques)

1. Principles & techniques about the faollowing:
   (i) pH meter
   (ii) Colorimeter
   (iii) Microscopy- Light microscopes: Compound, Phase contrast & Electron microscopes
   (iv) Centrifuge
   (v) Separation of biomolecules by chromatography & electrophoresis

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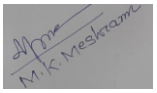
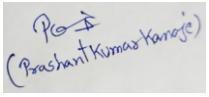
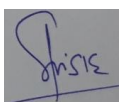



Dr. Sanjay Thite

B. Sc. Part III (2021-22)
Zoology
Practical

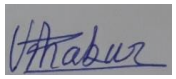
The practical work in general shall be based on syllabus prescribed in theory.
The candidates will be required to show knowledge of the following:

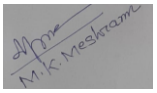
- Estimation of population density, percentage frequency, relative density.
- Analysis of producers and consumers in grassland.
- Detection of gram-negative and gram-positive bacteria.
- Blood group detection (A,B,AB,O)
- R. B. C. and W.B.C count
- Blood coagulation time
- Preparation of hematin crystals from blood of rat
- Observation of Drosophila, wild and mutant.
- Chromatography-Paper or gel.
- Colorimetric estimation of Protein.
- Mitosis in onion root tip.
- Biochemical detection of Carbohydrate, Protein and Lipid.
- Study of permanent slides of parasites, based on theory paper.
- Working principles of pH meter, colorimeter, centrifuge and microscope.

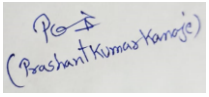
Scheme of marks distribution **Time: 3:30hrs**

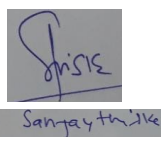
• Hematological Experiment	08
• Ecological Experiment: Grassland Ecosystem/ Population Density/Frequency/relative density	06
• Bacterial staining	05
• Biochemical experiment	06
• Practical based on Instrumentation (Chromatography/ pH meter/microscope/centrifuge.	05
• Spotting (5 spots)	10
7 Viva	05
8. Sessional	05











MICROBIOLOGY

BSc-3rd

Paper- I: Medical Microbiology and Immunology

UNIT-1: AIR BORNE DISEASES

Air borne diseases: Types- Tuberculosis, Pertussis, Diphtheria, Influenza, Small & Chicken pox, Mumps, Measles. Symptoms, treatment and prevention.

UNIT-2: WATER BORNE DISEASES

Concept and cause of water borne diseases; Types, Hepatitis, Dysentery, Diarrhea, Cholera, typhoid. Symptoms, treatment and prevention.

UNIT-3: CLINICAL DISEASE AND DIAGNOSIS

Clinical diseases: Diabetes, Asthma, multiple sclerosis, rheumatoid arthritis, cancer. Symptoms, Treatment and prevention.

UNIT-4: BASIC CONCEPT OF IMMUNITY

Immune system: Structure and function of the cells, tissues and organs of immune system. Types of immunity- humoral and cell-mediated, innate, acquired immunity. **Antigen- Antibody**: types, properties. Hapten, adjuvants, Immuno-globulins: Structure types, Properties and their function - Theory of antibody production.

UNIT-5: IMMUNO DISEASE DIAGNOSIS

Methods based on Ag-Ab interaction- precipitation, agglutination, ELISA, RIA, Immuno-electrophoresis, PCR based diagnosis method for infectious diseases.

Text Books Recommended:

1. Immunology: Kuby.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by K. J Wolfgang, McGraw- Hill Company.
4. Medical Microbiology; N. C. Dey and T.K. Dey, Allied agency, Calcutta.
5. Bacteriological Techniques by FJ Baker.
6. A Textbook of Microbiology; Dubey & Maheshwari; S. chand & Sons.
7. Scott's Diagnostic Microbiology by EJ Baron.

DR. K. K. Patel
29/05/2022

Paper- II: Environmental, industrial and Agricultural Microbiology

UNIT-1: AIR MICROBIOLOGY

Basics of Aerobiology, Microbes in atmosphere, source of microorganism in air, droplet nuclei, infectious dust, and bio-aerosol. Factors affecting microbial survival in the air. Sampling, collection and Isolation of microbes from air.

UNIT-2: WATER MICROBIOLOGY

Basic concept, water zonation, eutrophication, microbial community in natural water. Determining the quality of water- bacteriological evidence for fecal pollution, indicator of fecal pollution. Water purification methods. Disinfection of potable water supply.

UNIT-3: SOIL MICROBIOLOGY.

Soil as an environmental culture medium, microbes of soil. Brief account of microbial interactions-symbiosis, mutualism, commensalism, competition, predation, parasitism. Microbiological examination of soil. Rhizosphere-concept and role of microbes, rhizosphere and non-rhizosphere micro-flora. Mycorrhiza.

UNIT-4: INDUSTRIAL MICROBIOLOGY.

Introduction and brief history and scope, important microbes in various industries. Fermentation- definition, types-Aerobic and anaerobic, Batch and SSF. Important products bread, cheese, vinegar, fermented dairy products and oriented fermented food involving microbes. Microbial cells as food. SCP -mushroom cultivation, production of alcohol and fermented beverages, beer and Wine

UNIT-5: AGRICULTURAL MICROBIOLOGY

History of Agricultural Microbiology; Microbes and their importance in maintenance of soil, Biogeochemical cycles, role of microbes in maintaining the fertility of soil. Bio fertilizers –Bacterial, azotobacter and vermiform compost. Soil microorganism -association with vascular plants- phyllosphere, Rhizobium, Rhizoplane associative nitrogen fixation. Bio-fertilizers **-** Cyanobacterial and Azolla

Text Books Recommended:

1. Hugo, W.B., Russell, A.D, pharmaceutical Microbiology 4th edition. Blackwell scientific publications / Oxford.
2. Russell and Ayliffe, G. A .J (1982) Principles and practice of Disinfection, preservation and sterilization Oxford:
3. Gregory P.H. Microbiology of the atmosphere.2nd edition. Leonard Hill.
4. Food Microbiology by WC Frazier and D Westhoff.
5. Agricultural Microbiology by Bhagyaraj and Rangaswamy.
6. Bioremediation by KH Baker and DS Herson

DR. K. K. Patel
29/05/2002

PRACTICAL

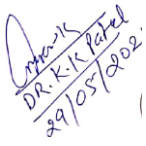
M. M. 50

Isolation of bacteria from air and soil (crop fields)
Isolation of fungi from air and soil
Relationship between OD and CFU measurements.
Measurement of fungal growth by dry weight and wet weight
Study of rhizospheric and phyllospheric microbes from economically important plants.
Biodegradation study of some organic molecules
Microbial assessment of potable water.
Determination of BOD, COD and dissolved oxygen.
Determination of blood group by slide agglutination test./TLC/DLC
Determination of heamoglobin.
Determination of quality of milk by MBRT
Isolation of Rhizobium from root nodules.

Scheme of practical examination

Time 4 hour MM- 50

1. Exercise on immunological test	10
2. Exercise on water analysis	10
3. Exercise on isolation and characterization of micro organism	05
4. Spotting (1 to 5)	10
5. Viva voce	05
6. Sessional	10
	Total- 50



HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Scheme of Examination

कक्षा	प्रश्नपत्र	विषय समूह	सैद्धा. अंक	प्रायो. अंक	योग
BSc. I year	I	भूगतिकी एवं भू–आकृति विज्ञान (Geodynamics & Geomorphology)	50	50	150
	II	खनिज एवं क्रिस्टल विज्ञान (Mineralogy & Crystallography)	50		
BSc. II year	I	शैलिकी (Petrology)	50	50	150
	II	संरचनात्मक भूविज्ञान (Structural Geology)	50		
BSc. III year	I	जीवाश्म विज्ञान एवं संस्तर विज्ञान (Palaeontology & Stratigraphy)	50	50	150
	II	भूसंसाधन एवं व्यावहारिक भूविज्ञान (Earth Resources & Applied Geology)	50		

-: Note :-

प्रत्येक वर्ष के विद्यार्थियों हेतु पाठ्यक्रम में उल्लेखित भूवैज्ञानिक क्षेत्रीय अध्ययन अनिवार्य होगा।

कक्षा / Class- B.Sc - III

Paper –I

जीवाश्म विज्ञान एवं संस्तर विज्ञान

(Palaeontology & Stratigraphy)

इकाई–01	(1)	जीवाश्म विज्ञानः जीवाश्म, परिभाषा, जीवाश्मन की आवश्यक परिस्थितियाँ एवं विधियॉ
	(2)	जीवाश्मों के उपयोग, सूचक–जीवाश्म एवं उनका महत्व
	(3)	संस्तर विज्ञान, पुरापारिस्थितिकी एवं पुराभूगोल के अध्ययन में जीवाश्म विज्ञान का महत्व।
	(4)	सूक्ष्मजीवाश्मविज्ञान एवं उसका महत्व।
	(5)	पादप जीवाश्मों का अध्ययन एवं उनका महत्व।
इकाई–02	(1)	फोरामिनिफेरा एवं एंथोजोआ जीवाश्मों की आकारिकी एवं भूवैज्ञानिक वितरण।
	(2)	गेस्ट्रोपोडा एवं लेमिलिब्रेन्किया जीवाश्मों की आकारिकी एवं भूवैज्ञानिक वितरण।
	(3)	सिफेलोपोड़ा जीवाश्मों की आकारिकी एवं भूवैज्ञानिक वितरण।
	(4)	इकाइनोडर्मेटा एवं ब्रेकियोपोडा जीवाश्मों की आकारिकी एवं भूवैज्ञानिक वितरण।
	(5)	ट्राइलोबाइट एवं ग्रेप्टोलाइट जीवाश्मों की आकारिकी एवं भूवैज्ञानिक वितरण।
इकाई–03	(1)	संस्तर विज्ञान के सिद्धान्त, भूवैज्ञानिक समय सारणी।
	(2)	अश्मसंस्तरिक, कालानुक्रम संस्तरिक एवं जैव संस्तरिक इकाईयों के विषय में मूलभूत धारणायें।
	(3)	भारतीय उपमहाद्वीप का संरचनात्मक एवं भौतिकीय उपविभाजन एवं उसकी विशिष्टतायें।
	(4)	भारत वर्ष के आद्यमहाकल्पीय (धारवार) शैलों का वितरण, वर्गीकरण, एवं आर्थिक महत्व।
	(5)	छत्तीसगढ़ के बस्तर, रावघाट संघों का वितरण, संस्तर विज्ञान एवं आर्थिक महत्व।
इकाई–04	(1)	विन्ध्य एवं छत्तीसगढ़ महासंघ के शैलों के वितरण, संस्तर विज्ञान एवं आर्थिक महत्व।
	(2)	गोंडवाना महासंघ का संस्तर विज्ञान, पुराजलवायु, भौगोलिक वितरण एवं आर्थिक महत्व।
	(3)	डेक्कन ट्रेप का संस्तर विज्ञान, भौगोलिक वितरण एवं आयु।
	(4)	बाघ संस्तर एवं लमेटा संस्तर का संस्तर विज्ञान, भौगोलिक वितरण एवं जीवाश्म।
	(5)	साल्ट रेंज शैल समूहों के पुराजीव समूहों का भौगोलिक वितरण संस्तर विज्ञान एवं जीवाश्मिकी।

इकाई–05 (1) स्पिटी क्षेत्रों के पुराजीव समूहों का भौगोलिक वितरण, संस्तर विज्ञान एवं आर्थिक महत्व।

(2) तिरूचिरापल्ली क्षेत्र के क्रिटेशियस शैलों का संस्तर विज्ञान, जीवाश्म एवं आर्थिकी।

(3) कच्छ क्षेत्र के जुरासिक शैलों का संस्तर विज्ञान, जीवाश्म एवं आर्थिकी।

(4) असम के तृतीयक महायुग समूह का भौगोलिक वितरण संस्तर विज्ञान एवं आर्थिकी।

(5) शिवालिक समूह का संस्तर विज्ञान, भौगोलिक वितरण एवं कशेरूकीय जीवाश्मीय तत्व।

प्रायोगिक कार्यः

(1) सैद्धांतिक पाठ्यक्रम के अन्तर्गत उल्लेखित जीवाश्मों की आकारिकी का अध्ययन।

(2) प्रमुख पादप जीवाश्मों का अध्ययन।

(3) भारत के रेखा मानचित्र में विभिन्न संस्तर विज्ञानी इकाईयों को दर्शाना।

(4) भारत के प्रमुख भूआकृतिक एवं शैल विर्वतनिक इकाईयों को रेखा मानचित्र में प्रदर्शित करना।

(5) भूवैज्ञानिक क्षेत्रीय अध्ययन (सात दिवसीय)

Class- B.Sc. - III

Paper –I

(Palaeontology & Stratigraphy)

Unit-1

(1) Palaeontology: Fossils- definition, Essentials for fossilization, modes of fossilization.

(2) Uses of fossils; Index fossils & their significance.

(3) Application of palaeontology in the study of Stratigraphy, Palaeoecology and Palaeo-geography.

(4) Micro palaeontology & its significance.

(5) Study of plant fossils & their significance.

Unit-2

(1) Morphology & geologic distribution of foraminifera & Anthozoa fossils.

(2) Morphology & geological distribution of Gastropoda and Lamellibranchia fossils.

(3) Morphology & geological distribution of Cephalopoda.

(4) Morphology & geological distribution of Echinoidea & Brachiopoda fossils.

(5) Morphology & geological distribution of Trilobite and Graptolite fossils.

Unit-3

(1) Principles of stratigraphy: Geological time scale.

(2) Basic concept of lithostratigraphic, chronostratigraphic & biostratigraphic units.

(3) Structural & physical subdivision and characteristic features of Indian subcontinent.

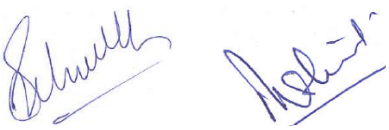
(4) Distribution, classification & economic importance of Archaeozoic rocks of India (Dharwar)

(5) Distribution, Stratigraphy & Economic Importance of Bastar & Raoghat group of rocks (Chhattisgarh)

Unit-4

(1) Distribution, stratigraphy & Economic importance of Vindhyan & Chhattisgarh supergroup of rocks.

(2) Stratigraphy, Palaeoclimate, Geographical distribution & economic aspects of Gondwana Supergroup.



(3) Stratigraphy, Distribution & age of Deccan Traps.

(4) Stratigraphy, Distribution & fossil contents of Bagh & Lameta Bed.

(5) Distribution, Stratigraphy & Palaeontology of Salt Range group of rocks.

Unit-5

(1) Distribution, Stratigraphy & Economic importance of Palaeozoic rocks of Spiti Valley.

(2) Stratigraphy, Distribution, Fossil content of Cretaceous rocks of Tiruchirapalli.

(3) Stratigraphy, Distribution, Fossil content & Economic importance of Jurassic rocks of Kutch-Region.

(4) Distribution, Stratigraphy, Economic importance of Tertiary rocks of Assam-Region.

(5) Distribution, Stratigraphy & Vertebrate Palaeontological importance of Siwalik group of rocks.

Practicals:-

(1) Study of morphology of fossils belonging to various phyla mentioned in theory curriculum.

(2) Study of Important plant fossils.

(3) Representation of Litho-units & Stratigraphic Units in outline map of India.

(4) Sketching of physiographic and tectonic divisions of India.

(5) Geological excursion for seven days.

Suggested Readings

(1) जीवाश्म विज्ञान के सिद्धांत– डॉ.अंबिका प्रसाद अग्रवाल

(2) जीवाश्म विज्ञान– डॉ. आर.पी. मिश्रा

(3) अकशेरूकी एवं कशेरूकीय जीवाश्म विज्ञान– डॉ. दीपक राज तिवारी

(4) भारत वर्ष का भूविज्ञान– डॉ. अंबिका प्रसाद अग्रवाल

(5) प्रायोगिक भू विज्ञान भाग–3– डॉ. गुप्ता, पुनवटकर, रघुवंशी

(6) Invertebrate Palaeontology- H.Woods.

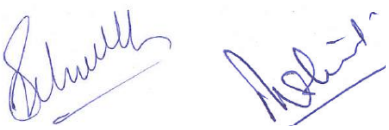
(7) Introduction to Palaentology- A.N. Davis.

(8) An Introduction to Invertebrate Palaeontology- P.C. Jain & M.S. Anantha Raman

(9) Historical Geology of India- Ravidra Kumar

(10) Geology of India- R. Vidhyanathan & M. Ramkrishne (GSI Publication)

(11) Geology of India & Burma- M.S. Krishnan.



कक्षा / Class- B.Sc-III

Paper –II

भूसंसाधन एवं व्यावहारिक भूविज्ञान

(Earth Resources & Applied Geology)

इकाई–01

(1) आर्थिक भूविज्ञान परिचय एवं परिप्रेक्ष्य : वैश्विक खनिज निचय एवं संसाधन, दिक्काल में खनिज निक्षेपों का वितरण।

(2) खनिज निक्षेपों का वर्गीकरण। भूवैज्ञानिक तापमापी।

(3) अयस्क निर्माण की मैग्मीय सांद्रण विधि। उष्णजलीय प्रक्रियायें।

(4) अपक्षय उत्पाद एवं अवशिष्ट निक्षेप। आक्सीकरण एवं सल्फाइड समृद्धि प्रक्रम।

(5) अयस्क निर्माण की अवसादी प्रक्रिया। बलकृत सांद्रण।

इकाई–02 भारत के संदर्भ में निम्नलिखित धात्विक/अधात्विक खनिज निक्षेपों की प्राप्ति अवस्था, खनिजकीय विशेषता, भूवैज्ञानिक एवं भौगोलिक वितरण एवं आर्थिक उपयोगों का वितरण।

(1) लौह, मैगनीज, क्रोमियम।

(2) ताम्र, सीसा, जस्ता।

(3) सोना, अल्युमिनियम।

(4) तापसह एवं उर्वरकखनिज।

(5) सीमेंट एवं केमिकल उद्योग में प्रयुक्त खनिज।

इकाई–03

(1) कोयला निक्षेपों की उत्पत्ति, परिभाषा एवं संस्तर विज्ञान।

(2) कोल शैलिकी के मूलभूत तथ्य। पीट, लिग्नाइट, बिटूमिनस, एंथ्रासाइट कोल, भारतीय कोल निक्षेपः विशेष संदर्भ में छत्तीसगढ़।

(3) प्राकृतिक हाइड्रोकार्बन की उत्पत्ति, स्थानांतरण एवं संचयन। आयल ट्रेप के प्रकारः संरचनात्मक, संस्तर विज्ञानी एवं मिश्रित। भारत के तटीय एवं अपतटीय पेट्रोलियम निक्षेप।

(4) रेडियोधर्मी खनिजः खनिजविज्ञान, भूरसायन, पूर्वेक्षण तकनीकी, भारत में रेडियोधर्मी खनिजों का भौगोलिक एवं भूवैज्ञानिक वितरण।

(5) खनिज आर्थिकी के सिद्धान्त, राष्ट्रीय खनिज नीति।

इकाई–04 (1) भूअभियांत्रिकी विज्ञान एवं उसका महत्व। शैलों के अभियांत्रिकी गुण।

(2) वृहद् बांध एवं सुरंग निर्माण के लिये भूवैज्ञानिक परिस्थितियों का अध्ययन।

(3) हवाई छायाचित्रों एवं उपग्रह इमेजियरी का प्रारंभिक अध्ययन। शहरी विकास में सुदूर संवेदन तकनीकी का अनुप्रयोग।

(4) जलचक्र। भूमिगत जल की प्राप्ति अवस्था। भूजल की गुणवत्ता।

(5) शैलों के भूजलीय गुण। जलभृत संस्तरों का वर्गीकरण। भारत का भूजल प्रदेश।

इकाई–05 (1) खनिज अन्वेषण का परिचय। खनिज अन्वेषण की सतही एवं अधोसतही विधियाँ।

(2) आर्थिक खनिजों के लिये पूर्वेक्षण विधियाँ : ड्रीलिंग, प्रतिचयन एवं आमापन।

(3) भूभौतिकीय पूर्वेक्षण तकनीकः गुरूत्वीय, विद्युतीय एवं चुम्बकीय विधियाँ।

(4) हवाई पूर्वेक्षण विधि एवं भूकम्पीय विधियाँ।

(5) खनिज स्त्रोंतों के अत्याधिक दोहन के पर्यावरणीय प्रभाव।

प्रयोगिक कार्यः

(1) सैद्धान्तिक पाठ्यक्रम में दिये प्रमुख धात्विक/अधात्विक खनिजों का भौतिक/प्रकाशीय गुणों के आधार पर अध्ययन।

(2) भारत के रेखा मानचित्र में प्रमुख धात्विक/अधात्विक खनिजों का वितरण दर्शाना।

(3) कोयला एवं उसके विभिन्न प्रकारों के नमूनों का स्थूलदर्शी अध्ययन।

(4) खनिज निष्कर्षण से संबंधित प्रायोगिक अभ्यास कार्यः निक्षेप आकलन, टनेज फेक्टर आकलन, ड्रीलिंग आदि से अभ्यास।

(5) स्टिरियोस्कोप के द्वारा ऐरियल छायाचित्र का अध्ययन एवं विवेचना।

(6) उपग्रह इमेजरी का अध्ययन एवं विवेचना।

(7) शैलों के भौमजलीय गुणों का अध्ययन, भौमजलीय मानचित्रों का बनाना एवं अध्ययन

(8) दस दिवसीय भूवैज्ञानिक क्षेत्रीय अध्ययन

Class- B. Sc. -III

Paper –II

(Earth Resources & Applied Geology)

Unit-1

(i) Economic Geology introduction & its perspectives; Global mineral deposit & resource. Distribution of mineral deposits in time & space.

(ii) Classification of mineral deposits. Geological thermometers.

(iii) Magmatic & Hydrothermal processes of mineral formation.

(iv) Weathering products & Residual deposits. Oxidation & supergene sulphide enrichment processes.

(ii) Sedimentary processes of ore formation. Placer deposits.

Unit-2

Geological, Geographical distribution, mode of occurrence, mineralogy & economic importance of following metallic & nonmetallic deposits of India.

(i) Iron, Manganese, Chromium

(ii) Copper, Lead, Zinc

(iii) Gold, Aluminum

(iv) Refractory and Fertilizer minerals

(v) Minerals used in cement & chemical industries.

Unit-3

(i) Coal deposits: Origin, Definition & stratigraphy

(ii) Fundamentals of coal petrography. Peat, Lignite, Bituminous & Anthracite. Indian coal deposits with special reference to Coal deposits of Chhattisgarh.

(iii) Origin of Natural-hydrocarbons, migration & accumulation. Types of oil traps; Structural, stratigraphic and composite. Offshore & Onshore oil deposits of India.

(iv) Radioactive minerals: Mineralogy, Geochemistry, Prospecting techniques, Geological & Geographical distribution of atomic-minerals.

(v) Principles of mineral economics. National mineral policy.

Unit-4

(i) Engineering Geology & its importance, engineering properties of rocks

(ii) Geological conditions for construction of large Dams and Tunnels.

(iii) Elementary study of Aerial photographs & satellite imageries. Application of remote sensing techniques in town-planning.

(iv) Hydrologic cycle. Mode of occurrence of ground water, quality of ground water.

(v) Hydrologic properties of rocks. Classification of Aquifers. Ground water provinces of India.

Unit-5

(i) Introduction to mineral exploration, Surface & subsurface methods of mineral Exploration.

(ii) Prospecting methods; Drilling, Sampling & Assaying.

(iii) Geophysical prospecting techniques: Gravity, Electrical & Magnetic methods.

(iv) Aerial and seismic prospecting methods.

(v) Environmental impact of over exploitation of mineral resources.

Practical-

(1) Study of important metallic and nonmetallic minerals on the basis of physical & optical properties.

(2) Distribution of important metallic and nonmetallic deposits within outline map of India.

(3) Magascopic studies of coal & its varieties.

(4) Exercises related to mineral exploration; Reserve calculation, Tonnage factor calculation, Exercises related to drilling.

(5) Study of Aerial photographs with the help of stereoscope.

(6) Study of satellite imageries.

(7) Study of hydrologic properties of rocks, Preparation of hydrogeological maps.

(8) Geological excursion for ten days.

Suggested Readings:

(1) आर्थिक भूविज्ञान– कृष्ण गोपाल व्यास

(2) आर्थिक एवं व्यावहारिक भूविज्ञान– आर.पी. मांजरेकर

(3) भौमजल विज्ञान– एल.के. रिछारिया

(4) प्रारंभिक खनिकी– बी.के. सिंह

(5) प्रायोगिक भूविज्ञान भाग–3– गुप्ता, पुनवटकर एवं रघुवंशी

(6) Economic mineral deposits of India- Umeshwar Prasad.

(7) Economic mineral deposits- A.Bateman

(8) Ore-deposit of India- Gokhale & Rao

(9) India's Mineral Resource- S. Krishnaswami

(10) Principles of Engineering Geology & Geo techniques- Krynine & Judd.

(11) Groundwater Hydrology- D.K. Todd

(12) Courses in Mining Geology- R.N.P. Arogyaswami

(13) Principles & Applications of photogeology- S.N. Pandey.

(14) Ground water- Assessment, Development & Management- K.R. Karanth

(15) Geophysical methods in Geology- P.V. Sharma.

(16) Environmental Geology- K.S. Valdiya (1987)

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HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2021-22
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A./B.Sc. –III
Subject: Statistics
Paper-I
Applied Statistics

Unit I

Indian Applied Statistics System: Present official statistical System in India, Methods of collection of Official Statistics, their reliability and limitations, and the principal publications containing such statistics on the topics-population agriculture, industry, trade, price, labour and employment, transport and communications, Banking and Finance.

Unit II

Demographic Methods: **S**ources of demographic data: Census, register and-hoc surveys, hospital records, demographic profiles of the Indian Census, Measurement of mortality, and life table,: crude death rate, age specific death rates, infant mortality rates, infant death rate, death rate by cause, standardized death rate, direct & indirect method of standardized death rate, Complete life tables- its main features,mortality rate and probability of dying , uses of survival tables

Measurement of fertility,: crude birth rate,, general fertility rate, age specific birth rate, total fertility rate, gross reproduction rate, net reproduction rate.

Unit III

Economic Statistics: Index number- definition, application of index numbers. Price relatives and quantity or volume relatives. Link and chain relatives, problems involved in computation of index numbers, uses of averages, simple aggregative and weighted average methods, Laspeyre's, Paasche's, Marchal-edgeworth's and Fisher's index numbers, Time and Factor reversal tests. Chain base index number, Consumer price –index numbers.

Unit IV

Static laws of demand and supply, Price elasticity of demand, Forms of demand functions, Engel's curves, Income elasticity of demand.

Analysis of income and allied distributions-Pareto distribution, graphical test, fitting of Pareto's Law, log normal distributions and its properties, Lorenz curve and estimation of elasticity from time series data, Gini's coefficient.

Unit V

Time series analysis- economic time series, different components, illustrations, additive and multiplicative models, determination of trend, growth curves, analysis of seasonal fluctuations, construction of seasonal indices.

REFERENCES

1. Croxton F.E. and Cowden D.J. (1969): Applied General Statistics, Prentice Hall of India.

2.Chatfield, C.(1980): The Analysis of Time Series-An Introduction ,Second Edition Chapman and Hall.

3.Goon A.M.;Gupta,M.K. and Dasgupta ,B(1986):Fundamentals of Statistics, Volume-Two, World Press,Calcutta

4. Guide to Current Indian Official Statistics: Central Statistical Organization, Govt. of India, New Delhi.

5. Mukhopadhyay ,P.(1999) : Applied Statistics, New Central Book agency Pvt. Ltd., Calcutta.

6. Srivastava O.S. (1983): A Text Book of Demography, Vikas Publishing.

ADDITIONAL REFERENCES

1. Cox,P.R.(1970):Demography,Cambridge University Press.

2. Pressat R. (1978): Statistical Demography, Methuen and Co. Ltd.

Paper-II
Statistical Quality Control and Computational Techniques

Unit I
Importance of statistical methods in industrial research and practice, specification of items and lot qualities corresponding to visual gauging, count and measurements, types of inspection, determination of tolerance limits. General theory of control charts, causes of variation in quality, control limits, sub-grouping, summary of out of control criteria. Charts for attributes, np chart, p-chart, c-chart, u- chart. Charts for variables, $\bar{X}$ and R charts, design of $\bar{X}$ and R charts, versues p chrts, process cabability of studies.

Unit II
Principle of acceptance sampling-problem of lot acceptance, stipulation of good and bad lots, Producer's and consumers risks, single and double sampling plans for all attributes , their OC functions, concepts of AQL, LTPD, AOQL, Average amount of inspection and ASN function, rectifying inspection plans, sampling inspection plans for variables, Indian Standard Tables Part-I(including applications), IS 2500 Part I.

Unit III
Computational Techniques: Difference tables and methods of interpolation: Newton's forward and backward interpolation formula, Lagranges method of interpolation, divided difference interpolation formula. Numerical differentiation and integration. Trapezoidal, Simpson's one – third formulae, iterative solutions of non-linear equations.

Unit IV
Linear Programming: Elementary theory of convex sets, definition of general linear programming problems (LPP), formulation problems of LPP, examples of LPP. Problems occurring in various fields, Graphical and Simplex methods of solving an LPP, artificial variables, duality of LPP, Transportation Problem (non-degenarate and balanced cases only), Assignment Problems.

Unit V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1.Brownless K.A. (1960): Statistical Theory and Methodology in Science and Engineering, John Wiley and Sons.
2.Grant E.L. (1964): Statistical Quality Control, McGraw Hill.
3. Ducan A.J. (1974): Quality Control and Industrial Statistics, Traporewala and Sons.
4. Gauss S.I. (1975) : Linear Programming Methods and Applications, McGraw Hill.
5. Montgomery, D.C. (1985): Introduction to Statistical Quality Control; Wiley.
6. Rajaraman, V. (1981) : Computer Oriented Numerical Methods, Prentice Hall.
7.Shanti Narayan (1993). Mathematical Analysis, S. Chand and Co.

8. Sastry S.S. (1987): Introductory Methods of Numerical Analysis, Prentice Hall
9. Taha H.A.(1982) Operational research :An Introduction ;Macmillan

ADDITIONAL REFERENCES:

1. Biswas Suddhendu (1996): Statistics of Quality Control,Sampling Inspection and Reliability,new Age international Publishers,New delhi.
2. Browker H.A. and Liberman G.T. (1962): Engineering Statistics, Prentece Hall.
3.Despande J.V. (1981). Text Book of Mathematical Analysis, Tata McGraw Hill.

4. Crowden, D.J. (1960): statistical Methods in Quality Control, Asia publishing Society
5. Garwin W.W. (1960): Introduction to Linear Programming, McGraw Hill.
6. Kanti Swarup,Gupta,P.K. and Singh,M.M. (1985):Operations Research;Sultan chand & sons.

7. Mahajan M. (2001) Statistical Quality Control, Dhanpat Rai & Co. (P. Ltd.).
8. Rao S.S. (1984) : Optimization Theory and Applications, Wiley Eastern.
9.Somasundaram, D. and Choudhari, B.(1996). A First Course in Mathematical Analysis, Narosa Publishing House.
10.Wagner H.M. (1973) Principle of O.R. with Applications to Managerial Decisions; Prentice Hall.
11.Wetherill ,G.B (1977) Sampling Inspection and Quality Control; Halsted Press.

Paper III:

Practical : Practical Based on Paper I & II

1. Computing measures of mortality and fertility, construction of life tables, graduation of mortality rates by Gompertz curve, fitting of Logistic curve.
2. Construction of index numbers by Laspeyre's, Paasche's, Marshell,-Edgeworth and Fisher method.
3. Determination of trend in a time series, construction of seasonal indices.
4. Fitting of Pareto curve to income data, Lorenz curve of concentration, Estimation of price elasticity of demand from time series data.
5. Drawing of $\bar{X}$ -R, np, p anf c –charts. Drawing of OC curve for single and double sampling plans.
6. Construction of difference tables. Use of Newton's, Lgrange's methods of interpolation and divided difference formulae, numerical evaluation of integrals using Trapezoidal and Simpon's one-third formulae, solution to non-linear equation by Newton-Raphson iterative method.
7. Formulation of LPPs and their duals. Solving LPPs by graphical and simplex methods, transportation and assignment problems.

DEFENCE STUDIES

PAPER-I

PROBLEMS OF WAR AND PEACE (Paper Code-0921)

Aim : The objective of this paper is to acquaint the students about the multidimensional problems of war and peace and humanitarian laws.

Note : Question will be set from each unit, there will be only internal choice.

Unit-I U.N.O. AND WORLD PEACE

1. Organs and its role.
2. Main specialized agencies of U.N.O.
3. Role of U.N.O. in world peace.
4. Peace keeping forces of the U.N.O.
5. Veto power and Security Council.

Unit-II WAR AND PEACE

1. Sattlement of International Disputes.
2. Diplomatic agents and Consuls.
3. War Crimes.
4. Neutrality.
5. Intervention.

Unit-III HUMANITARIAN LAW

1. Basic concepts and development of Humanitarian law.
2. UN General Assembly declaration of human rights on Dec. 10, 1948.
3. Protection of Victims and defenceless in armed conflict, POWs, wounded and civilians in Armed Forces.
4. Central Human Right Commission : Organisation and Function.
5. State Human Right Commission : Organisation and Function.

Unit-IV REFUGEE LAW

1. Meaning, Concept and causes of Refugee.
2. Refugee and IDPs.
3. Refugee law in India.
4. Refugee Problem in South Asia.
5. Role of International Committee of Red Cross and UNO in Refugee Problems.

Unit-V LAWS OF WAR

1. Law of Land war.
2. Law of Sea war.
3. Law of Air war.
4. Space law.
5. The International Court of Justice.

SELECTED READINGS :

1. Maunce clark, J : Readings in the Economics of War.
2. International Security : Modern political Science series.
3. Rajani Kothari : Word order.
4. Openhem, I : Use of Forces by states and International law.

PAPER - II

MODERN WARFARE

(Paper Code-922)

Aim : To enable students to appreciate the impact of Political, economic and technological developments on the patterns of conflicts between nations.

Note : Question will be set from each unit, there will be only internal choice.

UNIT-I 1. Development of Nuclear weapons.
2. Effects of Nuclear Explosion.
3. Spread of Nuclear Weapons.
4. Missile and their characteristics.
5. Type of Missiles.

UNIT-II 1. Trends in Science and Technology and their impact on war.
2. Role of Research and Development.
3. Development of Weapons and their impat on tactics
4. Command, Control, Communication and Intelligence (C^3I) in Modern Warfare.
5. Elements of National Power.

UNIT-III 1.Military Satellites.
2. Explosive Bombs.
3. War Gases.
4. Micro Organs : as a weapons.
5. Smart Weapons.

UNIT-IV 1. Rocket Technology and India.
2. Missile Technology and India.
3. Nuclear Technology and India.
4. Atomic Minerals and India.
5. Space Technology and India.

UNIT-V 1. New word order - Political, Social and Economical.
2. Alliance and Regional co-operation.
3. Mobilisation of resources for war.
4. War time economics.
5. New trends.

SELECTED READINGS :

1. Halailan Morton : Coutemporary Military strategy
2. Brodue, Y. : Strategy in the Missile Age.
3. Markabi, Y. : Nuclear war and Nuclear peace
4. Osanka. F.M. : Modern Guerilla warfare
5. Gerald. J. : Defence Psychology
6. Know Kalus : Science and Defence
7. Pandey Girishkant : Yudh mein vigyan aven Tachniki.

PRACTICALS

50 marks

There shall be practical examination of 3.5 hours duration carrying.
The division of marks shall be as follows :

(1) Plain Table Survey	:	15	Marks.
(2) Experimental Military Psychology	:	15	Marks.
(3) Group Descussion & Lectring	:	05	Marks.
(4) Viva-Voce :		05	Marks
(5) Sessional work & Record	:	10	Marks.

Section - A

Plain table Survey by inters section methods. (Atleast ten exercises in a session).

Section - B

Military - Psychology Experiment :

(1) Muller-Layer-IIlusion test.

(2) Koh's Block Design Test.

(3) Allexander Pass Along Test.

Section - C

Group Discussion and Lectures based on current topic on any international & national Problems.

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INDUSTRIAL CHEMISTRY

PAPER - I

(Paper Code-0925)

CHEMICAL PROCESS ECONOMICS **M.M. 34**

UNIT-I 1. Factors involved in project cost estimation, methods employed for the estimation of capital investment. 06L

2. Capital formation, elements of cost accounting. 05L

UNIT-II 1. Interest & investment cost, time value of money equivalence. 03L

2. Depreciation, method of determining depreciation, taxes. 04L

3. Some aspects of marketing, pricing policy. 04L

UNIT-III 1. Profitability criteria, economics of selecting alternatives. 03l

2. Variation of costs with capacity, Break-even point, optimum batch sizes, Production, schedulling etc. 05L

3. Sampling of Bulk materials, techniques of sampling of solids, liquids and gasses.

4. Collection & Processing data. 02L

5. Particle size determination. 02L

6. Rheological properties of liquids, plastics and their analysis.03L

INDUSTRIAL ORGANIZATION

UNIT-IV 1. Concept of scientific management in industry. 04L

2. Functions of management, decision making, planning, organising. directing & control. 09L

3. Location of industry. 03L

UNIT-V 1.Materials management. 05L

2. Inventory control. 04L

3. Management of human resources-selection, incentives, welfare & safety. 05L

BOOKS :

1. Economics of Chemical industry, Hempel, E.H.
2. Plant Design & Economics for Chemical Engineers, Peter Time Rhaus, McGraw Hill.
3. I.C.M.A. Booklets-9 & 10.
4. Industrial Organization & Management, Bethel, L.L.
5. Industrial Organization & Management, Tarachand, Vol. I & II.
6. Book on Management, O.P. Khandelwal.
7. Rheology theory & application, Vol. 5, Elrich, R.F.

PAPER - II
(Paper Code-0926)
PHARMACEUTICALS **M.M. 33**

UNIT-I 1. Historical Background & development of pharmaceutical industry in India in brief. 02L

2. Pharmacopoeias - Development of Indian pharmacopoeia & introduction ot B.P., U.S.P., E.P., N.F. & other Important Pharmacopoeias. 02L
3. Introduction to various types of formulations & roots of administration. 02L
4. Aseptic conditions, need for sterilisation, various methods of sterilisation. 02L

UNIT-II 1. Various types of pharmaceutical excipients their chemistry, process of manufacture & quality, specifications Glidants, lubricants, diluants, preservatives, antioxidants, emulsifying agents, coating agents, binders, coloring agents, flavouring agents geletin & other additives, sorbotol, mannitol, viscosity builders etc. 12L

2. Surgical dressing, sutures, ligatures with respect to the process, equipments used for manufacture, method of sterlilization and quality control. 05L

UNIT-III 1.Pharmaceutical packaging introduction, package selection, packaging materials, ancillary materials, packaging machinery, quality control of packaging materials. 05L

2. F.D.A., Important schedules & some legal aspects of drugs. 03L
3. Pharmceutical quality control (other than the analytical methods covered under core-subject) - sterility testing, pyrogenic testing, glass testing, bulk density of powders, etc. 06L

UNIT-IV 1. Evaluation of crude drugs-Moisture content, extractive value, volatile oil content, foreign organic matter, quantitative microscopic exercises, including starch, leaf content, (palisade ratio, stomatal number & index vein, islet number & vein
termination number), crude fiber content, introduction to chromatographic method
of dentification of crude drugs. 06L

2. Chromatography, Paper chromatography, TLC, HPLC, GLC. 04L
3. Ion chromatography. 01L

INSTRUMENTATION

UNIT-V1. UV-Visible spectroscopy. 03L
2. IR-Spectroscopy non-dispersive IR. 03L
3. NMR Spectroscopy. 03L
4. Atomic Absorption & Flame photometry. 03L
5. Neutron diffraction. 01L
6. X-Ray Fluorescence. 01L
7. Ion Selective Electrodes. 01L

BOOKS :

1. Instumental methods of analysis, Willard, Merit, Dean.
2. Introduction to instrumental methods of analysis, Braun, R.D., McGraw Hill.
3. Analytical chemistry, J.B. Dick, McGraw Hill.
4. Quantitative Inorganic analysis, A. Vogel.
5. Instrumental methods of Analysis, Skoog & West.
6. Instrumental Methods of Analysis, B.K. Sharma.

PAPER -III

(Paper Code-0927)

D R U G S M.M. 33

UNIT-I

1. Phyto-chemicals-Introduction to plant classification & crude drugs, cultivation, collection, preparations for the market & storage of medicinal plants.
2. Classification of various types of drugs with examples.
3. Raw meterials, process of manufacture, effluent handling, etc. of the following bulk drugs :-
   (i) Sulpha drugs-sulphaguandine, sulphamethoxazole.

UNIT-II

1. Chemical constitution of plants including carbohydrates, amino acids, proteins, fats, waxes, volatile oils, terpenoids, steroids, saponins flavonoids, tanins, glycosides, alkaloids.
2. Various isolation procedures for active ingredients with examples for alkaloids, reserpine one for steroids sapogenin, diosgenin, diogron.

UNIT-III

1. Antimicrobial :- Chloramphenicol, Furazolidne, Mercurochrome, Isoniazid, Na-PAS.
2. Analgesic-AntiInflammatory :- Salicylic acid and its derivatives, Ibuprofen, Mefenamic acid.
3. Steroidal Harmones :- Progesterone, Testosterone, Methyl testosterne.

UNIT-IV

1. Vitamins :- Vit.-A, Vit.-B6, Vit.-C.
2. Barbiturates :- Pentobarbital.
3. Blockers :- Propranolol, Atenolol.
4. Cardiovascular Agent :- Methyl dopa.
5. Antihistamins :- Chloropheneramine Maleate.

UNIT-V

1. Products based of fermentation processes :- Brief idea of micro-organisma, their structure, growth & usefulness. Enzyme systems useful for transformation, microbial products.
2. General principles of fermentation processes & product processing.
3. Manufacture of antibiotics - Pencillin-G & semi synthetic pencillines, Rifamycin, Vitamin-B12.
4. Bio-transformation process for prednisolone, 11-hydroxylation in steroids.
5. Enzyme catalysed transformation, manufacture of ephidrine.

BOOKS :-

1. Practical Pharmacognosy, T.B. Wllis.
2. Practical Pharmacognosy, T.N. Vasudevan.
3. Modern Pharmacognosy, Remstad, McGraw Hill.
4. Indian Pharmacopoea, 1985.
5. British Pharmacopoea, 1990.
6. Hand Book of Drugs & Cosmetic Act, Mehrotra.
7. Pharmaceutical excipients.
8. Pharmaceutical Dosage forms.
9. Principles of Medicinal Chemistry, W.O. Foye, Lea & Febigen, Publication Phidelphia.
10. Text Book of Organic Medicinal & Pharmaceutical Chemistry, Willson, Gisvold, Derge; Lippinett-Toppan.
11. Essentials of Medicinal Chemistry, Korolkovas & Burkhatter, Wiely Interscience.

PRACTICAL

Marks : 50

The Practical examination will be of 08 Hrs. Duration spread over two days carrying 50 Marks.

Two experiments have to be performed.

1. Synthesis of common industrial compounds involving two step reactions. 4-Bromoaniline, 3-Nitroaniline, Sulphanilamide, 4-Aminoben zoic acid, 4-Nitroben zoic acid, dihalobenzenes, Nitrohal obenzenes.
2. Industial analysis of common raw meterials as per industrial specification :- Phenol, Aniline, Formaldehyde, Hydrogen per Oxide, Acetone, Epoxide, Olefins, Oils etc.
3. Demonstration of various pharmaceutical packaging materials, quality control tests of some materials,-A1 Strips, Cartons, Glass bottles.
4. Limit tests for chlorine, heavy metals, arsenic, etc. of two representative bulk drugs.
5. Demonstration of various pharmaceutical products.
6. Active Ingradient analysis of few types of formulations representing different methodsof analysis-acidimetry, alkalimetry, non-aqueous.
7. Determination of sulphate ash, loss of drying & other tests of bulk drugs, complete I.P. monograph of three drugs representing variety of testing methods.
8. Evaluation of crude drugs-macroscopic examination-determination & identification of starch grannules, calcium oxalate.
9. Palisate ratio, stomatal index-determination & Identification of few drugs. Tlc method for identification.
10. Microbiological testing-determination of mic of some aNtibacterial drugs by zone/cup plate method.

DISTRIBUTION OF MARKS :

1. Experiment No. 1.	20
2. Experiment No. 2.	10
3. Viva	05
4. Sessional	05
5. Project Work	10
Total	**50**

B.Sc.-III
COMPUTER SCIENCE
PAPER - I
COMPUTER HARDWARE PART-C

AIM: The emphasis is on the design concepts & organizational details of the common PC, leaving the complicated Electronics of the system to the computer engineers.

Objective of the Course:

1. To introduce the overall organization of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating software, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardware.

N.B.: Since the computer organization study is very vast & complicated, so the study is restricted only to the description and understanding part, hence the paper-setter is requested to keep this important factor in mind.

UNIT-1: ORGANISATION OF Micro-Processor & MIRCO-COMPUTER:-

1. **Introduction & organization of Micro-Computer :**
   (a) Basic Components of Micro-computer : Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.
   (b) Interconnecting Components in a Micro-computer : Necessary functional block; Bussed architecture for microcomputer; memory addressing; Ad- dressing I/O ports; comparison of I/O mapped and memory mapped I/O.
   (c) Input Output Techniques: Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.
2. **An Introduction to the various as:**
   (a) General understanding of different ? P or CPU:
   Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.
   (b) The Registers of CPU: (Give Example of P -8088) Register organization of 8088, Search pad segment, pointer, Index and Flag, Registers.
   (c) Memory addressing modes of P -8088: Segment offset; Data addressing modes; Addressing for branch instructions.
   (d) I/O Addressing with P -8088: Memory mapped I/O & I/O mapped I/O.

UNIT-2: SYSTEM HARDWARE ORGANISATION OF COMPUTERS:

1. **Hardware Organization of the Personal Computer:**
   (a) Block diagram with various parts of PC.
   (b) The Mother Board of General P.C. : 8088 CPU; ROM & RAM; Keyboard & its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.

(c) The Serial I/O ports, COM-1 & COM-2.
(d) The parallel Port for Printer.
(e) Expansion Slots for RAM.
(f) Disk Controllers : For floppy, Hard disk, CD-ROM & Cassets drives.

2 **The Video Display of PCs :**

(a) Video Monitors; Monochrome and colour.
(b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.
(c) Video Control Through ANSI-SYS.
(d) Video Control Through ROM-BOIS : INT 10H.
(e) Direct Video Control; Monochrom & colour graphics adapters.
(f) Installing Customized Character Sets.

UNIT-3 : ORGANISATION OF OPERTING SYSTEM WITH SYSTEM HARDWARE :

1 **The ROM-BIOS Services :**

(a) Introduction to UNIX, ENIX, SUN, solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs.
(b) The ROM-BIOS Diskette Services, INT 13H.
(c) The ROM-BIOS Serial Port Services, INT 14H.
(d) The ROM-BIOS Keyboard Services, INT 16H.
(e) The ROM-BIOS Printer Services, INT 17H.
(f) Miscellaneous Service Provided by the ROM-BIOS : INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.

2 **The fundamental of Operating System viz. DOS/WINDOWS :**

(a) The loading of DOS & Its Basic Structure ; ROM bootstrap, IO.SYS, DOS.SYS & Command..COM.
(b) The Execution of the programs under DOS ; EXEC functions, program segment prefix; Features of COM & EXE program files.
(c) Device Handling by Dos ; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.
(d) File Structures of DOS ;
(e) The DOS Interrupts : INT 20H-2FH
(f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares.
(g) Installation of windows : Important system files in windows.

UNIT-4 : ORGANIZATION & HANDLING BY OPERATING SYSTEMS :

1 **Disk and Files under DOS :**

(a) Logical Structure of a Disk : Organization of disk for use; Boot record ; FAT files; disk or root directory.
(b) File Organization on a DOS disk : Logical volumes ; Sub directories; Volume labels.
(c) Manipulating Files under DOS : File attributes ; date and time, file Access; FCB functions.

2 **Memory Allocation, Program Loading and Execution :**

(a) Memory Management under DOS : EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.
(b) Loading and Executing Programs under DOS : The EXEC function ; Memory considerations; parameter blocks; calling & returning from EXEC.
(c) Loading the program overlays through EXEC.

UNIT-5: ORGANISATION OF HARDWARE BY OPERATING SYSTEM:

1 **Interrupt Handling through DOS :**

(a) Types of interrupts.
(b) Interrupt Vector Table in PC.
(c) Interrupt Service Routines.
(d) Special Interrupts in PC : Clock Interrupt; The -C or Break Interrupt ; DOS reserved interrupt INT 28H ; Patching memory resident routines.

2 **Filters for DOS :**

(a) Filters in operating systems.
(b) Redirection of I/O under DOS.
(c) The Filters Supplied with DOS.
(d) Writing Filters to run under DOS.

3 **Handling of Various Versions of Windows O.S. :**

(a) Setup Installation
(b) Trouble shooting
(c) Networking features **Text Book :**

1.Hardware and Software of Personal Computers.
By Sanjay K. Bose. (Wiley Eastern Ltd. New
Delhi).

SUPPORTING TEXT BOOKS :

1. Digital System from Gates to Mircoprocessor.
   By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).
2. Computer Fundamentals : Architecture & Organisation. By B. Ram.. (Wiley Eastern Ltd. New Delhi).

REFERENCE BOOKS :

1. IBM PC-XT and Clones : By Govinda Rajalu.
2. Microprocessor and interfacing : By D ouglas Hall.
3. Insight the IBM-PC : Peter Norton.
4. Micriprocessor System : 8086/8088 family architecture, programming & design: By Liu and Gibson.

B.Sc.-III
PAPER - II

Atm : To introduce DBMS and RDBMS using Back-end tool and Front-end tool.

Object of the Course:

1. To introduce Data Base Management System concepts.
2. To introduce the Relational Database Management System and Relational Database Design.
3. To introduce the RDBMS software and utility of query language.
4. To introduce basic concept of GUI Programming and database connectivity using Visual Basic.

UNIT-1: CONCEPT OF D.B.M.S. AND DATA MODELS

(a) Introduction to DBMS :- Purpose of Data base systems, views of data, Data Modeling Database Languages, Transaction management, Storage Management, Database Administrator and User, Database System Structure.

(b) E-R Model: Basic concepts, Constraints, Keys, Mapping Constaint, E-R Diagram, Weak and Strong Entity sets, E-R Database Schema, Reduction of an E-R Schema to Table.

UNIT-2. : RELATIONAL DATABASE MANAGEMENT SYSTEM

(a) Relational Model: Structure of Relational Database, Relational Algebra, Domain Relational Calculus, Extended Relational- Algebra Operation, Modification of database, Views.

(b) Relational Database Design: Pitfalls in Relational Database Design, Decomposition Functional Dependencies, Normalization: 1NF, 2NF, BCNF, 3NF, 4NF, 5NF.

UNIT-3 : INTRODUCTION TO RDBMS SOFTWARE - ORACLE

(a) Introduction: Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS.

(b) DDL and DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table, Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL Sub Queries. Views: What is Views, Create, Drop and Retrieving data from views.

(c) Security: Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges.

(d) PL/SQL : Block Structure in PL/SQL, Variable and constants, Running PL/SQL in the SQL*PLUS, Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.

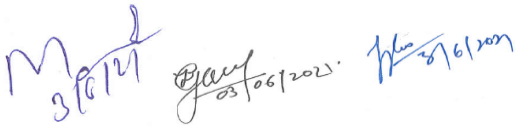
UNIT-4: G.U.I. PROGRAMMING

(a) Introduction to Visual Basic : Event Driven Programming, IDE, Introduction to Object, Controlling Objects, Models and Events, Working with Forms, MDI Form Working with standard Controls.

(b) Overview of Variables, Declaring, Scope, Arrays, User defined data types, Constants, Working with procedures: Function, Subroutine, and Property.

(c) Working with Data, Time, Format, String, and Math's Function. Controlling Program Execution: Comparison and Logical Operators, If...Then statements, Select Case Statement, Looping Structures, Exiting a loop. Error Trapping and Debugging.

(d) File Organization: Saving data to file, Sequential and Random access file, the design and coding.



UNIT-5: V DATA BASE PROGRAMMING IN VB

(a) Introduction :- Concept of DAO, RDO, ADO, input validation : field & form level validation, ADO object model : the ADO object Hierarchy, the connection object, the command object, record set object, parameter object, field object, record object, stream object, Error object, parameter object.

(b) Using Bound control to Present ADO data: Using the ADO data control, ADO data control properties, binding simple controls: Data list, data combo, Data Grid, Data Form Wizard: single form wizard, Grid form, master/Detail form. Programming the ADO data control: Refresh method, Event, Hierarchical flex Grid control.

(c) Data Environment & Data Report: Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data Environment, ADO Events in the Data report, Print Preview, Print, Export, Data report in code: Data reports Events, Binding data reports directly.

REFERENCE BOOKS:

1. Data Base System Concept : By Hery F. Korth, Tata McGraw Hill
2. Fundamental of Data Base System Concept : Nawathe & Elmasri (Pearson educations)
3. Oracle Complete Reference : By Oracle Press
4. Introduction to OOPS & VB : By V.K. Jain, Vikas Publishing House
5. Database Programming VB 6 : By B.P.B. Publication PRACTICALS :

1. **Practicals on Oracle:** At least 20 practicals covering the SQL, PL/SQL, Triggers, Views.
2. **Practicals on Visual Basic :** At least 20 pracricals on VB that covering basic and data controls components.

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INFORMATION TECHNOLOGIES

PAPER - I
AMPLIFIERS AND OSCILLATORS

UNIT-I POWER AMPLIFIER : Classification of amplifiers, requirement of power amplifiers, single ended class A power amplifiersand its efficiency, transformer coupled power amplifiers, power dissipation curve, harmonic dissipation curve, harmonic distortion in push-pull power amplifiers, power and efficiency calculation for push-pull for push-pull power amplifier, Distortion in push-pull power amplifier, Advantages of push-pull power amplifier

UNIT-IIFEEDBACK AMPLIFIERS AND OSCILLATORS :Feedback in amplifiers, types of feedback positive, and negative feedback. Derivation of input and output impedance voltage and current series feedback.Advantages of negative feedback, positive feedback, Berkhauson criteria for sustained oscillators. RF oscillators-Hartley oscillatot, Colpetts oscillators (Qualitative Study) relaxation oscillators, MultivibratorAstable, Monostable

UNIT-III OPERATIONAL AMPLIFIER AND POWER CONTROL DEVICES :Differentialamplifier, operational amplifier, Characteristics of an ideal OPAMP, definition of input bias current input offset current, current driff, impout offset, common mode rejection ratio, slow rate universal biasing technique. Application of OP-Amp, as inverting non-inverting amplifiers, differentiation, Integratior, scal charger and voltage follower, silicon controlled rectifier (SCR), Diac, Traic, and UUT (Only qualitative study)

UNIT-IV THE INTEL8080/8085MICROPROCESSOR: Introduction the 8085 pin diagram and functions, The 8085 architecture, addressing modes, the 8080/8085 instruction set, the 8080/8085 data transfer instructions, the 8080/8085 arithmetic instructions, the 8080/8085 logical instructions the 8080/8085 stack, I/O and machine controlled instructions

UNIT-V PROGRAMMING THE MICROPROCESSOR : Machineand assembling language simplified instruction set, instruction set, arithmetic operation, instructions set logical operations, instruction set data transfer operations, instruction set branch operations, instruction set-subroutine all the return operations, instruction set miscellaneous operations, writing a program, addressing mode, program branching, program looping using subroutines.
Programming the 8080/8085 microprocessor: Introduction straight line programs looping programs, mathematical programs.

B.Sc.-III
INFORMATION TECHNOLOGIES
PAPER – II
FUNDAMENTAL DATA STRUCTURE

UNIT – I Introduction to data structure: The concept of data structure, Abstract data structure, Analyses of Algorithm, The concept of list .
Stacks and Queues: Introduction to stack & primitive operation on stack stack as an abstract data type multiple stack,stacks application : infix, post fix, and Recursion, Introduction to queues, Primitive Operations on the queues , Queue as an abstract data type , Circular Queue Dequeue Priority Queue.

UNIT – II Linked list: Introduction to the linked list of stacks, The linked list of queues, Header nodes, Doubly linked list , Circular linked list Stack & Queues as a Circular linked list Application of linked list.

UNIT – III Tree: Basic Terminology, Binary Trees, Tree Representation as Array & Linked list, Binary tree representation , Traversal of binary trees : In order Preorder & post order.
Application of Binary trees , Threaded binary trees , B - Trees & Heights balanced tree , representation of B + & B* trees , Binary trees representation of trees , Counting binary trees 2 -3 Tree algorithm or manipulating 2 – 3 Trees.

UNIT – IV Searching & Sorting : Sequential Searching , binary search , Insertion sort , Selection sort , Quick sort , Bubble sort , Heap sort , Comparison of sorting methods .

UNIT - V Tables & Graphics: Hash Table, Collision resolution Techniques, Introduction to graphs , Definition , Terminology , Directed. Undirected & Weighted graph ,Representation of graphs , Graph Traversal Depth first & breadth first search , Spanning Trees , minimum Spanning Trees , The basic, Greedy Strategy for computing Algorithm of kruskal and Primes

TEXT & REFERENCE BOOK

Fundamental of Data structure	:	by S. Sawhney & Horowith.
Data Structure	:	By Trembly & Sorrenson
Data Structure Using Pascal	:	By Tannenbaun & Alugenntein
Data Structure	:	By Lipschuists (Schaume`s outline series Mograw Hill Publication)
Fundamental of Computer Algorithm	:	By Ellis Horowitz & Sartaj Sawtney.

Practical Work

1 The sufficient practical work should be done for understanding the date structure with C++
2 The sufficient practical work must be performed on stacks queues linked list treesect.
3 All practical works should prepared in form of print out and valuated while Practical examination.

INDUSTRIAL MICROBIOLOGY

Paper	Title	Time	Marks
First	Agriculture and Food Microbiology	3 hrs.	50
Second	Fermentation Technology & Government Regulations	3 hrs.	50
	PRACTICAL Examination (including sessionals)	4 hrs.	(20+5) 25
	Viva-Voce Exam. based on "Summer Job-Training Report"		25

PAPER-I

(Paper Code-0930)

AGRICULTURE AND FOOD MICROBIOLOGY M.M. : 50

UNIT-I Soil fertility and management of agricultural soils. Influence of available nitrogen on soil-fertility. Importance of crop-rotation. Soil management. Management practices : Pesticides and their impact and effect on soil fertility.

UNIT-II Microbial diseases of crop plants with special reference to Wheat, Rice, Maize, Groundnut, Mustard, Grapes, Potato and Papaya.

UNIT-III Control of plant diseases. Chemical control of plant diseases. Biological Control- its mechanism and importance. Biopesticides. Concept of integrated pest management (IPM). Bacterial insecticides.

UNIT-IV Food spoilage mechanism, Spoilage of stored products, fruits and vegetables. Microbial spoilage of milk and meat. Food borne diseases.

UNIT-V Food preservation methods - Asepsis, Pasteurisation canning, dessication, low temperature, Anaerobiosis, filteration.

Chemical preservation of food - salt and sugar, organic acids. Use of SO_2, ethylene and propylene oxides, wood smoke.

PRACTICALS

1. Study of microbial diseases of crop plants.
2. Study of effect of fungicides and insecticides on microorganisms.
3. Study of antagonistic activities amongst microorganisms.
4. Study of fungal contaminants from stored agricultural products.
5. Study of food spoilage microorganisms from sweets and bakery products.
6. Study of effect of the preservatives on the growth of microorganisms.
7. Study of UV radiations on microorganisms.
8. Study of the effect of agrochemicals on soil inhabiting microorganisms.

RECOMMENDED BOOKS :

1. Modern Plant Pathology by Bilgramy and Dubey.
2. Food Microbiology by Frazier.
3. Microbiology by S.S. Purohit.
4. Microbiology by P.D. Sharma.
5. Agricultural Microbiology by Rangaswami.
6. Plant Pathology by R.S. Mehrotra.

29/7/12 29/7/12

PAPER-II

(Paper Code-0931)

FERMENTATION TECHNOLOGY AND GOVERNMENT REGULATIONS

M.M. : 50

UNIT-I Fermentation equipments and production process. Principal types of fermenters - The batch fermenters, continuous stirred tank fermenters, Tubular fermenter, The fluidised bed fermenter, Solid State fermenters. Computer control of fermentation process. Strain improvement process.

UNIT-II Industrial production of organic acids - Lactic and citric acid.
Enzymes - amylase, protease and amino acids - L-lysine and glutamic acid.

UNIT-III Production of alcohol, wine, beer and acetic acid.
Production of antibiotics - Penicillin and Streptomycine.
Industrial production of vitamins - Vitamin B12 and Riboflavin.

UNIT-IV Importance of microorganisms in dairy industries. Production of cheese, Butter milk; and in bakery industries - leavening of bread, Indian fermented foods. Fungi and bacteria as a source of single cell proteins (SCP) and proteins.

UNIT-V Role of international organisation in biotechnology. Government programmes for biotechnology development. Government regulations of recombinant DNA research. Hazardous industrial wastes, Mycotoxin hazards in the production of fungal products. Regulations for disposal of biohazardous materials. Patenting of the products in Industries.

PRACTICALS

1. Measurement of production of citric acid by Aspergillus niger.
2. Measurement and production of alcohol by yeast.
3. Demonstration of Transformation of steroids.
4. Demonstration of IAA production by microbes.
5. Demonstration of enzyme production by microorganisms.
   (a) Amylase (b) Cellulase
6. Demonstration of mushroom cultivation.

RECOMMENDED BOOKS :

1. Industrial Microbiology by L.E. Casida.
2. Fermentation Technology by Whittakar.
3. General Microbiology, Vol. II, by Powar and Daginawala.
4. Molecular Biology and Biotechnology by H.D. Kumar.
5. Elements of Biotechnology by P.K. Gupta.

29/7/12 29/7/12

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

Session 2021-22

June 2021 onwards

Class: B.Sc. Electronics

Scheme of Examination

Paper Code	Course Opted	Title of Course	Theory	Practical	Grand Total	Minimum Passing Marks
First Year						
ELB-101	Core Course	Network Analysis And Analog Electronics	**50**		**100**	**33**
ELB-102	Core Course	Linear and Digital Integrated Circuits	**50**			
ELB-103P	Core Course Practical/Tutorial	Networks Analysis and Analog Electronics Lab	**25**	**50**	**50**	**17**
ELB-104P	Core Course Practical/Tutorial	Linear and Digital Integrated Circuits Lab	**25**			
Second Year						
ELB-201	Core Course	Communication Electronics	**50**		**100**	**33**
ELB-202	Core Course	Microprocessor and Microcontrollers	**50**			
ELB-203P	Course Practical/Tutorial	Communication Electronics Lab	**25**	**50**	**50**	**17**
ELB-204P	Course Practical/Tutorial	Microprocessor& Microcontroller Lab	**25**			
Third Year						
EL301	**Skill Enhancement Course**	Industrial Electronics	**50**		**100**	**33**
EL302	**Skill Enhancement Course**	Mobile Application Programming and Introduction to VHDL	**50**			
EL303P	**Skill Enhancement Course Practical**	Industrial Electronics Lab	**25**	**50**	**50**	**17**
EL304P	**Skill Enhancement Course Practical**	Mobile Application Programming and Introduction to VHDL Lab	**25**			

B. Sc. Part III

ELECTRONICS

Paper I

ELB 301: Industrial Electronics

Theory: **Max. Marks: 50**

Unit-1

Thyristors: Principles and operations of SCR, voltage amplifier gate characteristics of SCR, characteristics of two transistor models, Thyristor construction, rectifier circuit using SCR, GTO, Operation and characteristics of DIAC, TRIAC, Silicon Controlled Switch, Silicon Unilateral Switch, Silicon Bilateral Switch and Light activated SCR. Turn ON/OFF Mechanism: Basics of turn on and turn off methods.

Unit-2

Applications of SCR: Multiple connections of SCR, Series operation, Triggering of series connected SCR, Parallel operation, Triggering of parallel connected SCR, SCR di/dt calculation, Snubber circuit, dv/dt calculation across SCR, Types of converters, Full wave controlled rectifier with resistive load, FWCR with inductive load, FWCR with freewheeling diode .

Unit-3

Inverters: Types of inverters, Single phase bridge inverter, Mc Murray impulse communication inverter, Single phase half bridge voltage source inverter, Single phase full bridge voltage inverter, Step down choppers, Step up choppers, Chopper classification.

Other Applications: Induction heating, Resistance welding, Over voltage protection, Zero voltage switch, SMPS,UPS, DC circuit breaker, Battery charger, AC static switch, DC static switch, Time delay, Fan regulator using TRIAC .

Unit-4

PCB Fundamentals: PCB Advantages, components of PCB, Electronic components, IC's, Surface Mount Devices (SMD). Classification of PCB - single, double, multilayer and flexible boards, Manufacturing of PCB, PCB standards.

Schematic & Layout Design: Schematic diagram, General, Mechanical and Electrical design considerations, Placing and Mounting of components, Conductor spacing, routing guidelines, heat sinks and package density, Net list, creating components for library, Tracks, Pads, Vias, power plane, grounding, Lead cutting and Soldering Techniques, Testing and quality controls. PCB Technology Trends, Environmental concerns in PCB industry.

Unit-5

Analog/Digital Multimeter : Analog multimeter, AC and DC measurment, conversion of analog output to digital form (A/D), Dual ramp A/D converter, digital measuring system, multimeter block diagram, voltage, current and resistance measurments. Frequency counter: Elements of electronic counter, decade counting assembly temperature compensated prystal oscillator, universal counter, measurement modes; frequency measurement, period measurement, time interval measurement, measurement errors: gating errors, time base error, trigger level error.

Suggested Books:

1. Ramamourthy " Thyristor and their applications" East-West Publishers, 2nd Edition
2. Shamir K Datta " Power Electronics and Controllers" PHI, 3rd Edition
3. Power Electronics: Devices, Circuits and Industrial Applications
4. V.R. MoorthyOxford University Press; First Edition edition
5. Printed circuit Board – Design & Technology by Walter C. Bosshart, Tata McGraw Hill.
6. Printed Circuit Board –Design, Fabrication, Assembly & Testing by R.S.Khandpur, TATA McGraw Hill Publisher
7. Electronics Instrumentation H.S.Kalsi McGraw Hill Education; 3 edition (1 July 2017)
8. Modern Electronic Instrumentation and Measurement Techniques Albert Helfrick and William D Cooper Prentice Hall India Learning Private Limited
9. Electronic Instrumentation and Measurements David A. Bell Oxford University Press India; Third edition (12 April 2013)

Paper II

ELB 302: Mobile Application Programming and Introduction to VHDL

Theory: **Max. Marks: 50**

Unit-1

Introduction: What is mobile Application Programming, different Platforms, architecture and working of Android, iOS and Windows phone 8 operating system, comparison of Android, iOS and Windows phone 8.

Android Development Environment: What is Android, Advantages and Future of Android, Tools and about Android SDK, Installing Java, Eclipse, and Android, Android Software Development Kit for Eclipse, Android Development Tool: Android Tools for Eclipse, AVDs: Smartphone Emulators, Image Editing,

Unit-2

Android Software Development Platform: Understanding Java SE and the Dalvik Virtual Machine, directory Structure of an Android Project, common Default Resources Folders, the Values Folder, Leveraging Android XML, Screen Sizes, Launching your application: The AndroidManifest.xml File, Creating your First Android Application

Android Framework Overview: The Foundation of OOP, the APK File, Android Application Components, Android Activities: Defining the User Interface, Android Services: Processing in the Background, Broadcast Receivers: Announcements and Notifications, Content Providers: Data Management, Android Intent Objects: Messaging for Components, Android Manifest XML: Declaring Your Components

Unit-3

Views and Layouts, Buttons, Menus, and Dialogs, Graphics Resources in Android: Introducing the Drawables, Implementing Images, Core Drawable Subclasses, Using Bitmap, PNG, JPEG and GIF Images in Android, Creating Animation in Android

Handling User Interface (UI) Events: An Overview of UI Events in Android, Listening for and Handling Events, Handling UI Events via the View Class, Event Callback Methods, Handling Click Events, Touchscreen events, Keyboard Events, Context Menus, Controlling the Focus,

Unit-4

Content Providers: An Overview of Android Content Providers, Defining a Content Provider, Working with a Database

Intents and Intent Filters: What is an Intent, Implicit Intents and Explicit Intents, Intents with Activities, Intents with Broadcast Receivers **Advanced Android,** and New Features in Android 4.4**.**

iOS Development Environment: Overview of iOS, iOS Layers, Introduction to iOS application development.

Windows phone Environment: Overview of windows phone and its platform, Building windows phone application.

Unit-5

Introduction to VHDL: Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. VHDL Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format. VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behavior, process statements, process execution, sequential statements, architecture selection, configuration statements

Suggested Books:

1. Beginning Android 4, OnurCinar , Apress Publication
2. Professional Android 4 Application Development, Reto Meier, Wrox
3. Beginning iOS 6 Development: Exploring the iOS SDK, David Mark, Apress
4. Beginning Windows 8 Application Development, IstvánNovák, ZoltanArvai, GyörgyBalássy and David Fulop
5. Professional Windows 8 Programming: Application Development with C# and XML,Allen Sanders and Kevin Ashley, WroxPublication
6. Programming with Mobile Applications: Android, iOS, and Windows Phone 7 ,Thomas Duffy, Course Technology, Cengage Learning 2013
7. A VHDL Primer – J. Bhasker, Prentice Hall, 1999, III Edition. Verilog HDL-A guide to digital design and synthesis-Samir Palnitkar, Pearson, 2nd edition.

ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	**--**	**30**
Viva	**--**	**10**
Sessional	**--**	**10**
Total	**--**	**50**

ELB 303P: INDUSTRIAL ELECTRONICS & PCB Design LAB **MM-25**
(Hardware and Circuit Simulation Software)
Max.Marks:25

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. Study of chopper circuits

Design and Fabrication of Printed Circuit Boards

1. Design automation, Design Rule Checking; Exporting Drill and Gerber Files; Drills; Footprints and Libraries Adding and Editing Pins, copper clad laminates materials of copper clad laminates, properties of laminates (electrical & physical),
2. Study of soldering techniques. Film master preparation, Image transfer, photo printing, Screen Printing, Plating techniques etching techniques,
3. Study of Mechanical Machining operations, Lead cutting and Soldering Techniques, Testing and quality controls.
4. Study of Lead cutting and Soldering Techniques, Testing and quality controls.

Suggested Books:

1. Printed circuit Board – Design & Technology by Walter C. Bosshart, Tata McGraw Hill.

2. Printed Circuit Board –Design, Fabrication, Assembly & Testing by R.S.Khandpur, TATA McGraw Hill Publisher

ELB 304 P: Mobile Application & VHDL Lab M.M. - 25

Mobile communication Lab

1. Develop an application that uses GUI components, Font and Colors.
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multi-threading.
8. Develop a native application that uses GPS location information.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
11. Write a mobile application that creates alarm clock.

Introduction to VHDL

12. Write the VHDL Code & Simulate it for the following gates.
    a. Two I/P AND Gates.
    b. Two I/P OR Gates.
    c. Two I/P NAND Gates
    d. Two I/P NOR Gates.
    e. Two I/P Ex-OR Gates.
    f. NOT Gates
13. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
    a. Half adder b. Full adder

B.A./B.Sc. – Third Year

Session: 2021-22

Name of the Subject	:-	Anthropology
Paper	: -	First
Name of the Paper	:-	"FUNDAMENTALS OF HUMAN GENETICS, HUMAN GROWTH AND NUTRITION"

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT-I	Human Genetics: History, aims, scope and its application to human society Cell Division: Mitosis and Meiosis; Mendelism Chromosomes: Normal and Abnormal chromosomes. Concept of Genes, DNA & RNA. Types of Inheritance: Autosomal (Dominant and Recessive) & Sex linked Inheritance.
UNIT-II	Human Growth: Definition and scope of Human growth, Methods of studying human growth and development, Ageing
UNIT-III	Types of twins and their importance in genetic investigation. Inheritance of ABO Blood groups, P.T.C., Colour blindness and dermatoglyphics. Genetic Counselling, Eugenics. Population Genetics: Hardy- Weinberg Law
UNIT-IV	Nutrition: Nutritional requirement for normal growth. Common Nutritional disorders (Protein, Fat, Carbohydrate, Minerals and Vitamins).
UNIT-V	Ecology: Definition and Scope, Varieties of human ecosystems Environmental Pollution Biological Demography: Definition, nature and scope Demographic Profiles: Fertility, Mortality, Morbidity.

B.A./B.Sc. – Third Year

Session: 2021-22

Name of the Subject	:-	Anthropology
Paper	: -	Second
Name of the Paper	:-	THEORIES IN SOCIAL-CULTURAL ANTHROPOLOGY

Total Marks: 50 Pass Marks: 17

Syllabus

UNIT-I The contributions made by the following Anthropologists to Social-Cultural Anthropology.
(I) E. Durkheim, (II) F. Boas. (Ill) R. Redfield, (IV) A. L. Kroeber. (V) S.C. Dube, (VI) M.N. Shrinivas, (VII) L.P. Vidyarthi,

UNIT-II Evolution: Biological and cultural evolution
Evolutionism: Classical Evolutionism (E.B. Tylor & L.H. Morgan); Neo – Evolutionism (Leslie White & Gordon Childe)
Diffusionism: British, German-Austrian (Kulture kreise) and American diffusionism (Cultural traits, Culture Complex, Culture Area, Culture focus)

UNIT-III Function and structure:
Functionalism (Malinowski)
Structure Functionalism (Radcliff Brown)
Structuralism (Levi - Strauss).

UNIT-IV Personality and Culture:
Basic personality and Model Personality (Cora-du-bois, Abraham Kardinar)
Culture pattern: Configurationalism (Ruth Benedict)
Anthropological study of National character
Contribution of Margret Mead in study of National Character

UNIT-V Field work tradition in Anthropology
Major tools of Research: Schedule, Questionnaire, observation, interview, case study, Geneological Study
Types of Anthropological Methods: Historical Method, Comparative Method and Functional Method.

B.A. /B.Sc. – Third Year

Session : 2021-22

Name of the Subject :- Anthropology

Paper No. : - Practical

Name of the Paper :- SOMATOSCOPY, SOMATOMETRY AND GENETICAL TRAITS

Total Marks: 50 Pass Marks: 17

Syllabus

OBJECTIVES:
The objective of this practical course is to introduce the student about the tools and Method, analysis & statistical methods used in Human Biology. Laboratory procedures in blood grouping and dermatoglyphics would give confidence in dealing with all the applied dimensions.

Part-1 Somatoscopic Observation

1. Skin colour
2. Eye
3. Nose
4. Hair
5. Lips

Part –2 Somatometry:

(a) Measurements on body:

1. Height vertex,
2. Height tragus,
3. Suprasternale height,
4. Biacromial Breadth,
5. Bi-illiocristal breadth,
6. Tibiale height,
7. Upper extremity length,
8. Sitting height,
9. Height dactylion,
10. Body weight.

(b) Head and Face Measurement:

1. Morphological upper facial length.
2. Physiognomic upper facial length.
3. Morphological facial length.
4. Bizygomatic breadth.
5. Max head length.
6. Max head breadth.
7. Nasal length.
8. Nasal breadth.

(c) Somatometry indices:

1. Cephalic index.
2. Nasal index.
3. Facial index.

Part- 3 Genetic Traits:

ABO blood group. Colour blindness, PTC taste sensitivity, Dermatoglyphics: Methods of taking finger and palm prints and their analysis

Part-4 Statistics: Mean, Median, Standard deviation, X^2 test.

ELECTRONICS EQUIPMENT MAINTENANCE

	Max. Marks	Min. pass Marks
Paper - I Trouble shooting and maintenance of audio and video Equipments.	50	17
Practical	50	17
Project	50	17

PAPER-I

(Paper Code - 0913)

TROUBLE SHOOTING AND MAINTENANCE OF AUDIO AND VIDEO EQUIPEMENTS

UNIT-I REMOTE CONTROL AND SPECIAL CIRCUITS:

Remote control, electromechanical control system, electronic touch tuning frequency synthesiser, TV tuner, automatic fone tuning (AFT), booster emplifier, automatic brightness control, instantious circuitry, picture tube boosters.

ALIGNMENT AND SERVICING EQUIPMENTS :

Antistatics and low leakage multimeters, soldering Iron, Vacuum tube voltmeter (VT VM) Cathode Ray Oscillouscope (CRO) single Generation Video pattern Generator Coulor IIur Generation Vector Scope, High voltage probe Cable connectors shielding and Graunding.

UNIT-II TELEVISION:

Trouble shooting procedure, troubles shooting monochrome receivers, servicing of various functional blocks, trouble, shooting colour receivers, servicing circuit modeles, saprets precautions in television servicing.

TELEVISION CAMERA TUBES : Basic principles and maintenance recording.

UNIT-III BLOCK DIGRAM OF VCR :

Requirement of VCR, retaining video drums, helical scan, guard band, frequency response, serva systems, tape tension regulatar, real servo, system control. Different formats, the quacruplex format, type B segmented format, type C formet, the U matic format, the 1/2" V.H.S. format, 3-Max system.

UNIT-IV SINGAL PROCESSING, CHROME PROCESSING :

Colour under technique, recovery of down converted chrome signals, luminance processing. frequency modulation, deviation and band width, autometic gain correction, limited, pre-enphasis, replay of luminance signal, Y/C delay, drop out compensator, block diagram of main requirements, zero guard band system, turners and modulators, the modulator. Servo mechanisms and system control : Recording, playback, tracking, capstan servo system control, loading and tereading and play mode, record mode, auto stops, counter, audio video muting.

UNIT-V CARE OF MECHANICAL SYSTEM:

Cleaning of head and tape path. Lubrication, replacement of parts, replacement of audio CTC head, replacement of video drum, dihedral error, table height, tape tension. drive toungue stop brenks.

ELECTRONIC SYSTEM ALUGNMENTS:

Instruments, fault finding the power supply, free funning speed the servo system, tracking, video system, playback section alignment, amplifier balance and gain, luminance signal adjustment, D.O.C., F.M. demodulator, limited balance, carrier leak, noise canceller, colour processing, up conversion automatic colour correction, autometic face connection recording, luminance, synctip or clamping frequency, deviation set, white clip, chrominance, summary.

NEW TECHNOLOGIES:

Industrial aspects of consumer electronics, jigs and fixture, quality control/ management, production techniques, business cycle new technologies, compact disc, laser disc.

PAPER - II

(Paper Code - 0914)

PRACTICAL

A student is required to do atleast 2 experiments in an acadmic year, and one month summer Training. The scheme of practical examination will be as follows :

(1) On experiment of 3 hours duration and one month summer Training.

(2) The marks for summer training will be awarded by the teachers teaching the students on the basis of the certificate issued by the external supervisor of the summer training.

Marks		
Experiment	25	Marks
Sessional	10	Marks
on month summer training	15	Marks
Total	**50**	**Marsk**

Orientation and connection to TV antenna. Knowledge of booster connection and replacement. Knowledge of bloon Unit - different types (for different TV sets) and replacement of ballon, Replacement of front end.

Power supply and resistance cold tests. Voltage measurement at different points.

Horizantal and vertical oscilator checking and testing using CRO.

To see and read circuit diagram and to identity (Locate) various block on p/s, H and V deflection, video amplifier, audio, section, chroma section, IF section, tuner, tube and direction yokes (connecting and

adjustment).

Audio section wave form testing step by step-sound separator, sound take off from IF section and tenonwards to detector amplifier, IF alignment and loud speaker. (intercarrier sound take off).

If stage testing : IF alignment, tunner and band select.

Chroma processor : testing singals at various IC's.

Remote control studies-range, direction various, controls, IR transmitter and receiver, coding of signal.

Fault finding: cold testing and voltage testing of various parts. (Revision of parts

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

B.Sc. III

BIOTECHNOLOGY

PAPER – I

PLANT, ENVIRONMENTAL AND INDUSTRIAL BIOTECHNOLOGY

MM-50

UNIT-I

1. Introduction to Plant cell and Tissue culture: History, Scope and Application.
2. Tissue culture Media and Cellular Differentiation.
3. Protoplast Isolation and Fusion, Organogenesis, Embryogenesis, Anther and Ovary culture.

UNIT-II

1. Agrobacterium Mediated Transformation, Ti and Ri Plasmid.
2. Bt Gene and Bt Cotton, Edible vaccines and Genetically modified plants- Golden Rice, Herbicide Resistance, Drought Resistance.
3. Germplasm storage and Cryopreservation.

UNIT-III

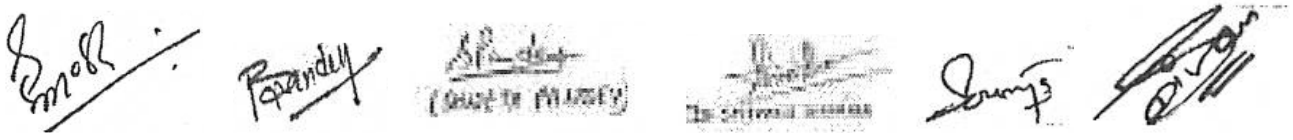
1. General Introduction and Scope of Environmental Biotechnology.
2. Environmental Pollution and its type.
3. Solid Waste Management: Principle of management, Types of Sources, Effect of Solid waste, Concept of composting and Vermi composting.
4. Wastewater Treatment: Physical, Chemical, and Biological.

UNIT-IV

1. Biofertilizer and Biopesticides- Cyanobacteria, Bacteria, Fungi; Significance and Practices.
2. Bioremediation of Xenobiotics compounds.
3. Types of IPR-Patents, Copyright, Trademark, G.I., Patenting Genes and Life form.

UNIT-V

1. Types of Bioreactor: Design of Stirred tank, Fluidized bed.
2. Fermentation: Lactic acid and Alcohol.
3. Industrially important Microorganisms: Isolation, Preservation (Slant, Mineral Oil and Lyophilize) and its application.
4. Food Technology: Food spoilage. Canning, Packing and Food Preservation.



B.Sc. III
BIOTECHNOLOGY

PAPER – II

IMMUNOLOGY, ANIMAL AND MEDICAL BIOTECHNOLOGY

MM-50

UNIT-I

1. Concept of Immunity: Innate and Acquired, Humoral and Cell mediated Response.
2. Cells and Organs involved in Immune system-Structure and Function.
3. Antigen, Antibody: Types, Structure and Functions.

UNIT-II

1. Cytokines
2. Autoimmune diseases- Hemolytic Anemia, Rheumatoid arthritis, Insulin dependent diabetes.
3. Immuno deficiencies. Diseases-SCID, AIDS.

UNIT- III

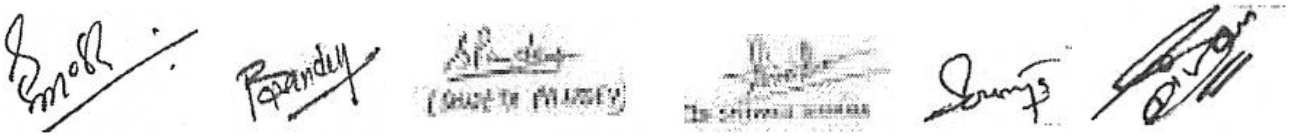
1. Antigen-Antibody Interaction: Agglutination, Precipitation, RIA, ELISA, Immuno Electrophoresis and Immunofluorescence.
2. Immunity of Infectious Diseases: Protozoa (Malaria, Kalaazar), Bacteria (T.B., Typhoid) and Virus (Influenza, Pox).
3. Fundamental of Epidemic Diseases: Swine flu and Dengue.

UNIT-IV

1. Animal Cell Culture and Growth Media.
2. Primary, Secondary culture and Established Cell line Culture.
3. Tissue engineering: Basic Concept, Transgenic animal: Mice and Sheep.

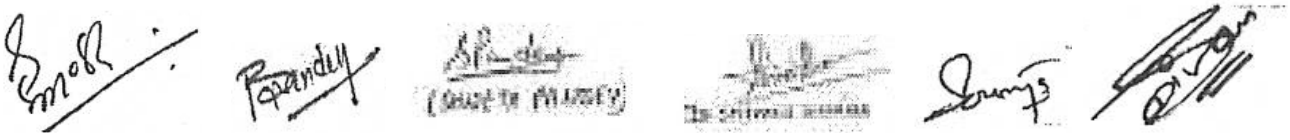
UNIT-V

1. Hypersensitivity, Interferon and Monoclonal antibody.
2. Organ Transplantation, Biology of Cancer.
3. *In vitro* fertilization and Embryo Transfer.



List of Books-

1. A test Book of Biotechnology: Indu Shekher Thakur, 2nd edition. I.K. International Pvt. Ltd., New Delhi.
2. Biotechnology (Fundamentals and Applications): S.S. Purohit - Agrobios (India), Jodhpur.
3. Fundamentals of Microbiology and Immunology: Ajit Kr. Banerjee, Nirmalya Banerjee -New central Book Agency (P) Ltd., Kolkata.
4. Plant Biotechnology: H.S. Chawla - Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Plant Biotechnology: B.D. Singh - Kalyani Publication, New Delhi.
6. Biotechnology: Fundamental &Application (2005) S.S. Purohit
7. Immunology: J. Kubey et al. 7th edition.
8. Immunology: Roitt et al.
9. Fundamental of Immunology: W. Paul.
10. Plant Tissue culture: K.K.De.
11. Plant Tissue Culture (Practical): H.S. Chawla.
12. Biochemistry & Molecular Biology of Plant: Buchanan, Gruissemen& Jones 2nd edition.
13. Tools and Techniques in Biotechnology (2011) M. Debnath



List of Practical's

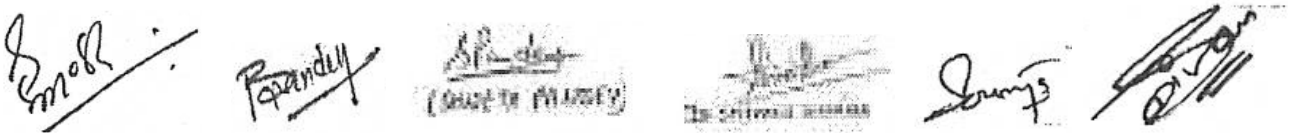
PLANT, ENVIRONMENTAL, INDUSTRIAL AND MEDICAL BIOTECHNOLOGY

1. Preparation of Tissue culture media.
2. Sterilization of plant material.
3. Seed Germination, Root, Shoot and Callus Culture.
4. Determination of total dissolved solids of water.
5. Determination of DO, BOD, COD of water.
6. Determination of Coliform by MPN Test.
7. Production of Enzymes/Antibiotics/Acids.
8. Effect of Biopesticides on microorganism
9. Antigen Antibody interaction- Determination of Blood Group and Rh factor.
10. Widal Test
11. VDRL Test.
12. ELISA Test.
13. Perform of Immuno-diffusion

SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. **MM-50**

1. Experiment based on Paper - I	
(i) Plant tissue culture	08 marks
(ii) Environment / Industrial	07marks
2. Experiment based on Paper - II	15 marks
3. Spots	10marks
4. *Viva-voce*	05marks
5. Sessional/ Record	05marks



BIOCHEMISTRY

PAPER - I

MOLECULAR BIOLOGY

UNIT-I BASIC CONCEPTS OF GENETIC INFORMATION

a. Nucleic acids as genetic information carriers, experimental evidence e.g. bacterial genetic transformation, Hershey - Chase Experiment, TMV reconstitu-tion rexperiment.

b, Central dogma of molecular genetics - current version, reverse transcription and retroviruses.

c. Primary structure of nucleic acids and their properties, silent features of eukaryotic, prokaryotic and viral genome; highly repetitive, moderately repretitive and unique DNA sequences.

d. Basic concepts about the secondary structures of nucleic acids, 5' 3' direction antiparallel strands, base composition, base equivalence, bae pairing and base stacking in DNA molecule. and buoyant density and there.

UNIT-II STRUCTURAL LAVELS OF NUCLEIC ACIDS AND SEQUENCING

a. Secondary and tertiary structure of DNA : Watson and Crick model, A.B. and Z types of DNA major and minor grooves, chirality of DNA, tertiary structure of DNA.

b. Structure and properties of RNA; Classes of RNA secondary and tertiary structures.

c. Nucleic acid hybridization : Cot value and satellite DNA.

d. Sequencing : Restriction and modification system; sequencing of DNA and RNA.

UNIT-III a. DNA REPLICATION

DNA replication in prokaryotes - conservative, semi conservative and dispersive types, experimental evidence for semi conservative replication. DNA poly-merases, other enzymes and protein factors involved in replication. Mechanism of replication. Inhibitors of DNA replication.

b. TRANSCRIPTION

Transcription in prokaryotes RNA polymerase, promoters, initiation, elongation and termination of RNA synthesis, inhibitors of transcription. Reverse tran-scriptase, post transcriptional processing of RNA in eukaryotes.

UNIT-IV TRANSLATION AND REGULATION OF GENE EXPRESSION

a. Genetic code : Basic feature of genetic code, biological significance of degeneracy. Wobble hypothesis, gene within genes and overlapping genes.

b. Mechanism of translation : Ribosome tructure, A and P sites, charged tRNA, f-mat-tRNA initiator codon, Shine Dalgarno consensus sequence (AGGA), formation of 70S initiation complex, role of EF-Tu, EF-Ts, EF G and GTP, nonsense codons and release factors RF 1 and RF 2.

c. Regulation of gene Expression in prokaryotes : Enzyme induction and repression, operon concepts, Lac operon, Trp operon.

UNIT-V MUTATION AND REPAIR

a. Mutation: Molecular basis of mutation, types of mutation, e.g. transition, transversion frame shift, insertion, deletion, suppresser sensitive, germinal and somatic, backward and forward mutations, true reversion and suppresion, dominant and recessive mutation, spontaneous and induced mutations = Ledergerg's replica plating experiment.

b. Mutagenecity testing : Correlation of mutagenecity and carcinogenicity : Ames testing, Random and site directed mutagenesis.

c. DNA Rapair : UV repair system in E.Coli, Significance of thymine in DNA.

RECOMBINATION AND TECHNOLOGY

Restriction endonucleases, brief discussion of steps in DNA cloning. Application of recombinant DNA technology.

Books:

1. Biochemistry J David Rawn, Neil Patterson Publisher, North Carolina.
2. Molecular biology of the gene JD Watson, NH Hopkins, JW Robert, JP Stretz, AM Weiner, Freeman San Francisco.
3. Fundamental of biochemistry by D Voet and CW Pratt, John Wiley & Sons, NY.
4. Text book of biochemistry Thomas M Devin, John Weley & Sons, NY.

PAPER - II

NUTRITIONAL, CLINICAL & ENVIRONMENTAL BIOCHEMISTRY

M.M.-50

UNIT-I NUTRITIONAL BIOCHEMISTRY

Nutrition and dietary habits

a. Introduction and definition of foods and nutritiori. Factors determining food acceptance, physiological, energy, body building (growth and development).

Regulation of body temperature. Physiology and nutrition of carbohydrates, fats, proteins and water. Vitamins A,D,E,K, Vit B-Complex and Vit C and minerals like Ca, Fe and Iodine and their biological functions. Basic food groups : energy giving foods, body building foods and protective foods.

b. Composition of balanced diet, recommended dietary allowances (RDA) for average indian, locally available foods, inexpensive quality foods and food stuff's rich in mor ethan one nutrients. Balanced vegetarian diet, emphasis on nutritional adequacy.

UNIT-II NUTRITATINE AND CALORIFIC VALUES OF FOODS

a. Basic concepts of energy expenditure, units of energy, measurement of energy expenditure by direct or indirect calorimetry, calculation of non protein RQ with respect to carbohydrates and lipids. Determination of heat production of the diet. The basal metabolism and method of measuring basal metabolic rate (BMR) energy requirements during growth, pregnancy, lactation and various physiologi-cal activities. Calculation of energy expenditure of average man and women.

b. Specific dynamic action (SDA) of foods, naturitive value of various kinds of foods generally used by Indian population. Planning of dietary regimes for infants, during pregnancy and old age. Malnutrition, its implications and relationship with dietary habits and prevention of malnutrition pecially protein-calories malnutrition (Kwashiorkor and Marasmus) by improvements of diets. Human milk and its virtues, breast vs formulated milk feeding. Food preservation standards, food adulterations and precautions, government regulations on poreservation and quality of food.

UNIT-III CLINICAL BIOCHEMISTRY

i) Basic concepts of clinical biochemistry

a. Definition and scope of clinical biochemistry in diagnosis, a brief review of units and abbreviation used in expression concentration and standard solutions. Quality control. Manual vs automation in clinical laboratory.

b. Collection and preservation of biological fluids (blood, serum, plasma, urine and CSF) Chemical analysis of blood, urine and CSF. Normal values for important constitutes (in SI units) in blood (plasma / serum), CSF and urine, clearance tast for urea.

UNIT-IV (i) CLINICAL ENZYMOLOGY

a. Definition of functional and non- functional plasma enzymes. Isozymes and diagnostics Tests. Enzymes pattern in health and diseases with special mention of plasma lipase, amylase, cholinesterase, alkaline and acid phosphatase, SGOT, SGPT, LDH and CPK.

b. Functional tests of kidney, liver and gastric fluids.

(i) Hypo and hyper-gylcemia, glycogen storage diseases, lipid mal-absorption and steatorrhea, sphingolipidosis, role of lipoproteins. Inborn errors of amino acid metabolism alkaptonuria, phenyl-ketonuria, albinism, gout and hyper-uricemia.

UNIT-V ENVIRONMENTAL BIOCHEMISTRY

(i) Air pollution : Particulate matter, compounds of carbon, sulphur, nitrogen and their interactions, methods of their estimation, their effect on atmosphere.

(ii) Water pollution : Types of water boides and their general characteristic, major pollutants in domestic, agricultural and industrial wastes, methods of their estimation, effects of pollutants on plants and animals, treatment of domestic and industrial wastes, solid-wastes and their treatment.

Books :

1. Modern nutrition in health and diseaser by Whol and Goodhart.
2. Human nutrition and Dietetics-S. Davidson and passmore-ELBS Zurich.
3. Tietz fundamental of clinical Chemistry by Cart A Burits & ER Ashwood Saunders WB Co.
4. Leacture Notes on Clinical Biochemistry-LG Whitby, AF Smith, GJ Beckett.

PRACTICAL FOR IIIrd YEAR

LABORATORY - III (BCH 305)

1. Estimation of DNA by diphenylamine method.
2. Effect of temperature on the viscosity of DNA using Ostwald's Viscometer.
3. Extraction of RNA and its estimation by Orcinol method.
4. Estimation of hemoglobin by measuring total iron in blood.
5. Estimation of calcium and phosphorus in serum & urine.
6. Estimation of creatine and creatinine in urine.
7. Estimation of immunoglobulins by precipitation with saturated ammonium sulphate.
8. Denaturation fo enzyme, studies on DNA.
9. a. Separation of proteins by column chromatography. b. Determination of proteins by dye binding assay.
10. Separation of proteins by SDS-polyacrylamide gel electrophoresis.

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. १५६० /अका./2019 दुर्ग, दिनांक 04/07/2019

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–एक के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

————00————

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–एक के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2019–20 से लागू किये जाते हैंः–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी, प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान, लाईब्रेरी साईंस
2. बी.एस–सी. – आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.एस.सी– (गृह विज्ञान) आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।
4. विधि – एल.एल.बी.
5. प्रबंध – बी.बी.ए.

उपरोक्त विषयों को शिक्षा सत्र 2019–20 से संशोधित रूप में स्नातक स्तर भाग–एक के लिए लागू किया जाता है स्नातक स्तर भाग दो एवं तीन के पाठ्यक्रम यथावत रहेंगे।

अतः आपसे अनुरोध है कि पाठ्यक्रम परिवर्तन/संशोधन से महाविद्यालय के शिक्षकों एवं छात्र–छात्राओं को अवगत कराने का कष्ट करेंगे।

टीप :– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय की वेबसाईट पर उपलब्ध है।

संलग्न : उपरोक्तानुसार।

कुलसचिव

B.Sc.Part-I
विषय–सूची

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-Ii examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the third year.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognized by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-I examination.

3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognized by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-II examination.

4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-III examination.

5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department or College.

6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in-

   (i) Foundation Course:

   (ii) Any one of the following combinations of three subjects:-

      1. Physics, Chemistry &Mathematics.
      2. Chemistry, Botany &Zoology.
      3. Chemistry, Physics &Geology.
      4. Chemistry, Botany &Geology.
      5. Chemistry, Zoology &Geology.
      6. Geology, Physics &Mathematics.
      7. Chemistry, Mathematics &Geology.
      8. Chemistry, Botany & Defense Studies.
      9. Chemistry, Zoology & Defense Studies
      10. Physics, Mathematics & Defense Studies.
      11. Chemistry, Geology & Defense Studies

12. Physics, Mathematics &Statistics
13. Physics, Chemistry &Statistics
14. Chemistry, Mathematics &Statistics.
15. Chemistry, Zoology &Anthropology.
16. Chemistry, Botany &Anthropology.
17. Chemistry, Geology &Anthropology.
18. Chemistry, Mathematics &Statistics.
19. Chemistry, Anthropology & Defense Studies.
20. Geology, Mathematics &Statistics.
21. Mathematics, Defense Studies &Statistics
22. Anthropology, Mathematics &Statistics
23. Chemistry, Anthropology & Applied Statistics
24. Zoology, Botany &Anthropology
25. Physics, Mathematics &Electronics.
26. Physics, Mathematics & Computer Application
27. Chemistry, Mathematics & Computer Application
28. Chemistry, Bio-Chemistry &Pharmacy
29. Chemistry, Zoology &Fisheries.
30. Chemistry, Zoology &Agriculture
31. Chemistry, Zoology &Sericulture
32. Chemistry, Botany & Environmental Biology
33. Chemistry, Botany &Microbiology
34. Chemistry, Zoology &Microbiology
35. Chemistry, Industrial Chemistry &Mathematics
36. Chemistry, Industrial Chemistry &Zoology
37. Chemistry, Biochemistry, Botany
38. Chemistry, Biochemistry, Zoology
39. Chemistry, Biochemistry, Microbiology
40. Chemistry, Biotechnology, Botany
41. Chemistry, Biotechnology, Zoology
42. Geology, Chemistry &Geography
43. Geology, Mathematics &Geography
44. Mathematics, Physics &Geography
45. Chemistry, Botany &Geography

(iii) Practical in case prescribed for core subjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to that effect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/ group of subjects. In subject/ group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examination separately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementary examination.

10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.

SCHEME OF EXAMINATION

Subject	Paper	Max. Mark	Total Marks	Min. Marks
Environmental Studies		**75**	**100**	**33**
Field Work		**25**		
Foundation Course				
Hindi Language	I	75	75	26
English Language	I	75	75	26

नोट– प्रत्येक खंड में से 2 दो प्रश्न हल करने होंगे। सभी प्रश्नपत्र समान अंक के होगें।

Three Elective Subject:

1.	Physics	I	50		
		II	50	100	33
		Practical		50	17
2.	Chemistry	I	33		
		II	33	100	33
		III	34		
		Practical		50	17
3.	Mathematics	I	50		
		II	50	150	50
		III	50		
4.	Botany	I	50		
		II	50	100	33
		Practical		50	17
5.	Zoology	I	50		
		II	50	100	33
		Practical		50	17
6.	Geology	I	50		

	II	50	100	33
	Practical		50	17
7. Statistics	I	50		
	II	50	100	33
	Practical		50	17
8. Anthropology	I	50		
	II	50	100	33
	Practical		50	17

Subject	Paper	Max. Marks	Total Marks	Min. Marks
9. Defense Studies	I	50		
	II	50	100	33
	Practical		50	17
10. Micro Biology	I	50		
	II	50	100	33
	Practical		50	17
11. Computer Science	I	50		
	II	50	100	33
	Practical		50	17
12. Information Technology	I	50		
	II	50	100	33
	Practical		50	17
13. Industrial Chemistry	I	34		
	I	33	100	33
	II	33		
	Practical		50	17
14. Bio Chemistry	I	50		
	II	50	100	33
	Practical		50	17
15. Bio Technology	I	50		
	II	50	100	33
	Practical		50	17

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986.

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the University or examination centres.
3. Calculators with, memory and following variables be permitted +, –, x, , square, reciprocal, exponentials log, square root, trigonometric functions, wize, sine, cosine, tangent etc. factorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

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Part - I

SYLLABUS FORENVIRONMENTAL STUDIES AND HUMAN RIGHTS
(Paper code-0828)

MM. 75

इन्वायरमेंटल साईंसेस के पाठ्यक्रम को स्नातक स्तर भाग–एक की कक्षाओं में विश्वविद्यालय अनुदान आयोग के निर्देशानुसार अनिवार्य रूप से शिक्षा सत्र 2003–2004 (परीक्षा 2004) से प्रभावशील किया गया है। स्वशासी महाविद्यालयों द्वारा भी अनिवार्य रूप से अंगीकृत किया जाएगा।

भाग 1, 2 एवं 3 में से किसी भी वर्ष में पर्यावरण प्रश्न–पत्र उत्तीर्ण करना अनिवार्य है। तभी उपाधि प्रदाय योग्य होगी।

पाठ्यक्रम 100 अंकों का होगा, जिसमें से 75 अंक सैद्धांतिक प्रश्नों पर होंगे एवं 25 अंक क्षेत्रीय कार्य (Field Work) पर्यावरण पर होंगे।

सैद्धांतिक प्रश्नों पर अंक – 75 (सभी प्रश्न इकाई आधार पर रहेंगे जिसमें विकल्प रहेगा)

(अ) लघु प्रश्नोंत्तर – 25 अंक
(ब) निबंधात्मक – 50 अंक

Field Work- 25 अंकों का मूल्यांकन आंतरिक मूल्यांकन पद्धति से कर विश्वविद्यालय को प्रेषित किया जावेगा। अभिलेखों की प्रायोगिक उत्तर पुस्तिकाओं केसमान संबंधित महाविद्यालयों द्वारा सुरक्षित रखेंगे।

उपरोक्त पाठ्यक्रम से संबंधित परीक्षा का आयोजन वार्षिक परीक्षा केसाथ किया जाएगा।पर्यावरण विज्ञान विषय अनिवार्य विषय है, जिसमें अनुत्तीर्ण होने पर स्नातक स्तर भाग–एक के छात्र/छात्राओं को एक अन्य विषय के साथ पूरक की पात्रता होगी। पर्यावरण विज्ञान के सैद्धांतिक एवं फील्ड वर्क के संयुक्त रूप से 33ः (तैंतीस प्रतिशत) अंक उत्तीर्ण होने के लिए अनिवार्य होंगे।

स्नातक स्तर भाग–एक के समस्त नियमित/भूतपूर्व/अमहाविद्यालयीन छात्र/छात्राओं को अपना फील्ड वर्क सैद्धांतिक परीक्षा की समाप्ति के पश्चात् 10 (दस) दिनों के भीतर संबंधित महाविद्यालय/परीक्षा केन्द्र में जमा करेंगे एवं महाविद्यालय के प्राचार्य/केन्द्र अधिक्षक, परीक्षकों की नियुक्ति के लिए अधिकृत रहेंगे तथा फील्ड वर्क जमा होने के सात दिनों के भीतर प्राप्त अंक विश्वविद्यालय को भेजेंगे।

UNIT-I THE MULTI DISCIPLINARY NATUREOF ENVIRONMENTALSTUDIES

Definition, Scope and

Importance Natural Resources:

Renewable and Nonrenewable Resources

(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people and relevant forest Act.

(b) Water resources: Use and over-utilization of surface and ground water, floods drought, conflicts over water, dams benefits and problems and relevant Act.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging ,salinity.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

(f) Land resources: Land as a resource, land degradation, man induced landslides soil erosion and desertification.

(12 Lecture)

UNIT-II ECOSYSTEM

(a) Concept, Structure and Function of and ecosystem

- Producers, consumers and decomposers.
- Energy flow in thee co system
- Ecological succession
- Food chains, food webs and ecological pyramids.
- Introduction, Types, Characteristics Features, Structure and Function of Forest, Grass, Desert and Aquatic Ecosystem.

(b) Biodiversity and its Conservation

- Introduction - Definition: genetic. species and ecosystem diversity
- Bio-geographical classification of India.
- Value of biodiversity: Consumptive use. Productive use, social ethics, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as mega-diversity nation.

- Hot spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wild life conflict.
- Endangered and endemic species of India.
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

(12Lecture)

UNIT- III

(a) Causes, effect and control measures of

- Air water, soil, marine, noise, nuclear pollution and Human population.
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Disaster Management: floods, earthquake, cyclone and landslides.

(12Lecture)

(b) Environmental Management

- From Unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, water shed management.
- Resettlement and rehabilitation of people, its problems and concerns.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.
- Wasteland reclamation
- Environment protection Act: Issues involved in enforcement of environmental legislation.
- Role of Information Technology in Environment and Human Health.

UNIT- IV

General background and historical perspective- Historical development and concept of Human Rights, Meaning and definition of Human Rights, Kind and Classification of Human Rights.

Protection of Human Rights under the UNO Charter, protection of Human Rights under the Universal Declaration of Human Rights, 1948.

Convention on the Elimination of all forms of Discrimination against women.

Convention on the Rights of the Child, 1989.

UNIT-V

Impact of Human Rights norms in India, Human Rights under the Constitution of India, Fundamental Rights under the Constitution ofIndia, Directive Principles of State policy under the Constitution of India, Enforcement of Human Rights in India.

Protection of Human Rights under the Human Rights Act, 1993- National Human Rights Commission, State Human Rights Commission and Human Rights court in India.

Fundamental Duties under the Constitution of India.

Reference/ Books Recommended

1. SK Kapoor- Human rights under International Law and IndianLaw.
2. HO Agrawal- Internation Law and HumanRights
3. एस.के. कपूर —मानव अधिकार
4. जे.एन. पान्डेय — भारत का संविधान
5. एम.डी. चतुर्वेदी —भारत का संविधान
6. J.N.Pandey - Constitutional Law ofIndia
7. Agarwal K.C. 2001 Environmental Biology, Nidi pub. Ltd.Bikaner
8. Bharucha Erach, the Biodiversity of India, Mapin pub. Ltd. Ahmedabad 380013,India, Email:mapin@icenet.net(R)
9. Bruinner R.C. 1989, Hazardous Waste Incineration. McGraw HillInc.480p
10. Clark R.S. Marine pollution, Clanderson press Oxford(TB)
11. Cuningham, W.P.Cooper. T.H.Gorhani, E & Hepworth.M.T,200
12. Dr. A.K.- Environmental Chemistry. Wiley EasternLtd.
13. Down to Earth, Center for Science and Environment(R)
14. Gloick, H.P. 1993 Water in crisis. pacific institute for studies in Deve. Environment& Security. Stockholm Eng. Institute. Oxford University, Press. m473p.
15. Hawkins R.E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Mumbai(R)
16. Heywood, V.H. & Watson, T.T.1995 Global Biodiversity Assessment, Cambridge Univ. Press1140p
17. Jadhav H. & Bhosale, V.H. 1995 Environmental Protection and Law. Himalayapub. House, Delhi284p
18. Mckinney M.L.& School R.M.1996, environmental Science systems & solutions,web enhanced edition,639p
19. Mhadkar A.K. Matter Hazardous, Techno-Sciencepublication(TB)
20. Miller T.G.Jr. Environment Science, Wadsworth publication co.(TB)
21. Odum E.P.1971, Fundamentals of Ecology, W.B. Saunders Co.USA,574p
22. Rao M.N. & Datta, A.K. 1987, Waste water treatment. Oxford & IBH pub.co.pvt.Ltd 345p
23. Sharma B.K. 2001, Environmental chemistry, Goel pub. House,Meerut
24. Survey of the Environment, TheHidu(M)
25. Townsend C. Harper J. And Michael Begon, Essentials of Ecology, Blackwell Science(TB)
26. Trivedi R.K.Handbook of Environment Laws, Rules, Guidlines, Compliancesand Standards, Vol land II, EnvironmentMedia(R)
27. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science publication (TB)
28. Wanger K.D.1998, Environmental Management. W.B. Saunders Co. Philadelphia,USA 499p

संशोधित पाठ्यक्रम

बी.ए. / बी.एस–सी. / बी.कॉम. / बी.एच.एस.–सी.

भाग – एक (आधार पाठ्यक्रम)

प्रश्न पत्र– प्रथम (हिन्दी भाषा)

(पेपर कोड –0101) पूर्णांक– 75

नोट :–

1. प्रश्न पत्र 75 अंक का होगा।
2. प्रश्न पत्र अनिवार्य होगा ।
3. इसके अंक श्रेणी निर्धारण के लिए जोड़े जायेंगे।
4. प्रत्येक इकाई के अंक समान होंगे।

पाठ्य विषय :–

इकाई–1

क. पल्लवन, पत्राचार, अनुवाद, पारिभाषिक शब्दावली एवं हिंदी में पदनाम

ख. ईदगाह (कहानी) – मुंशी प्रेमचंद

इकाई–2

क. शब्द शुद्धि, वाक्य शुद्धि, शब्द ज्ञान–पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी शब्द, समश्रुत शब्द, अनेक शब्दों के लिए एक शब्द एवं मुहावरे–लोकोक्तियाँ

ख. भारत वंदना (कविता)– सूर्यकान्त त्रिपाठी निराला

इकाई–3

क. देवनागरी लिपि – नामकरण, स्वरूप एवं देवनागरी लिपि की विशेषताएँ, हिंदी अपठित गद्यांश, संक्षेपण, हिंदी में संक्षिप्तीकरण

ख. भोलाराम का जीव (व्यंग्य) – हरिशंकर परसाई

इकाई–4

क. कम्प्यूटर का परिचय एवं कम्प्यूटर में हिंदी का अनुप्रयोग

ख. शिकागो से स्वामी विवेकानंद का पत्र

इकाई–5

क. मानक हिन्दी भाषा का अर्थ, स्वरूप, विशेषताएँ, मानक, उपमानक, अमानक भाषा

ख. सामाजिक गतिशीलता – प्राचीन काल, मध्यकाल, आधुनिक काल

मूल्यांकन योजना :–

प्रत्येक इकाई से एक–एक प्रश्न पूछा जाएगा। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमशः 8 एवं 7 होंगे। प्रश्न–पत्र का पूर्णांक 75 निर्धारित है।

पाठ्यक्रम संशोधन का औचित्य :–

व्याकरण के बुनियादी ज्ञान, संप्रेषण, कौशल, सामाजिक संदेश एवं भाषायी दक्षता को ध्यान में रखते हुए यह पाठ्यक्रम प्रस्तावित है।

FOUNDATION COURSE

PAPER - II

ENGLISH LANGUAGE **M.M. 75**

(Paper code - 0792)

UNIT-1 **Basic Language skills : Grammar and Usage.**

Grammar and Vocabulary based on the prescribed text.
To be assessed by objective / multiple choice tests.

(Grammar - 20 Marks
Vocabulary - 15 Marks)

UNIT-2 **Comprehension of an unseen passage.** **05**

This should simply not only (a) an understanding of the passage in question, but also.
(b) a grasp of general language skills and issues with reference to words and usage within the passage and (c) the Power of short independent composition based on themes and issues raised in the passage.
To be assessed by both objective multiple choice and short answer type tests.

UNIT-3 **Composition :** Paragraph writing **10**

UNIT-4 **Letter writing** (The formal and one Informal) **10**

Two letters to be attempted of 5 marks each. One formal and one informal.

UNIT-5 **Texts :** **15**

Short prose pieces (Fiction and not fiction) short poems, the pieces should cover a range of authors, subjects and contexts. With poetry if may sometimes be advisable to include pieces from earlier periods, which are often simpler than modern examples. In all cases, the language should be accessible (with a minimum of explanation and reference to standard dictionaries) to the general body of students schooled in the medium of an Indian language.

Students should be able to grasp the contents of each place ; explain specific words, phrases and allusions; and comment on general points of narrative or argument. Formal Principles of Literary criticism should not be taken up at this stage.

To be assessed by five short answers of three marks each.

BOOKS PRESCRIBED -

English Language and Indian Culture - Published by M.P. Hindi Grant Academy Bhopal.

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Dr. M. Chakraborty DR. S Gupta DR. MERILY ROY

Session:
2019-20

PHYSICS

OBJECTIVES OF THE COURSE

The undergraduate training in physics is aimed at providing the necessary inputs so as to set forth the task of bringing about new and innovative ideas/concepts so that the formulated model curricula in physics becomes in tune with the changing scenario and incorporate new and rapid advancements and multi disciplinary skills, societal relevance, global interface, self sustaining and supportive learning.

It is desired that undergraduate i.e. B.Sc. level besides grasping the basic concepts of physics should in addition have broader vision. Therefore, they should be exposed to societal interface of physics and role of physics in the development of technologies.

EXAMINATION SCHEME:

1. There shall be 2 theory papers of 3 hours duration each and one practical paper of 4 hours duration. Each paper shall carry 50 marks.
2. Numerical problems of at least 30% will compulsorily be asked in each theory paper.
3. In practical paper, each student has to perform two experiments one from each groups as listed in the list of experiments.
4. Practical examination will be of 4 hours duration- one experiment to be completed in 2 hours.

   The distribution practical marks as follows:

Experiment	:	15+15=30
Viva voce	:	10
Internal assessment	:	10
5. The external examiner should ensure that at least 16 experiments are in working order at the time of examination and submit a certificate to this effect.

30/5/19 30/5/19 30/5/19

30/5/19 30/5/19

Session 2019-20

PHYSICS

B.Sc. Part-I

Paper-I

MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER

(Paper code 0793)

Unit- 1 Cartesian, Cylindrical and Spherical coordinate system, Inertial and non-inertial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit-2 Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes, introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations: spring and mass system, simple and compound pendulum, torsional pendulum.

Unit-3 Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit-4 E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field- CRO sensitivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields: velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit-5 Elasticity: Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic- constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity: Poiseulle's equation of liquid flow through a narrow tube, equations of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

TEXT AND REFERENCE BOOKS:

1. E M Purcell, Ed Berkely physics course, vol. Mechanics (Mc. Gr. Hill) R P Feynman.
2. R B Lighton and M Sands, the Feynman lectures in physics, vol I (B) publications, Bombay, Delhi, Calcutta, Madras.
3. D P Khandelwal, Oscillations and waves (Himalaya Publishing House Bombay).
4. R. K. Ghosh, The Mathematics of waves and vibrations (Macmillan 1975).
5. J.C. Upadhyaya- Mechanics (Hindi and English Edition.)
6. D.S. Mathur- Mechanics and properties of matter.
7. Brijlal and Subramanium- Oscillations and waves. Resnick and Halliday- Volume I
8. Physics Part –1: Resnick and Halliday.

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PHYSICS

Paper-II

ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THEORY

Unit-1 Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals, flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant-voltage and Constant-current Sources. Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem.

Unit-2 Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.

Gauss's law and its application: E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet of Charge and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit-3 Dielectric constant, Polar and Non Polar dielectrics, Dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation,

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit-4 Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

Biot-Savart's Law and its applications: B due to (1) a Straight Current Carrying Conductor and (2) Current Loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital law (Integral and Differential Forms).

Unit-5 Electromagnetic induction, Faraday's law, electromotive force, integral and differential forms of Faraday's law Mutual and self inductance, Transformers, energy in a static magnetic field. Maxwell's displacement current, Maxwell's equations, electromagnetic field energy density. The wave equation satisfied by E and B, plane electromagnetic waves in vacuum, Poynting's vector.

TEXT AND REFERENCE BOOKS:

1. Berkeley Physics Course, Electricity and Magnetism, Ed. E.M. Purcell (Mc Graw - Hill).
2. Halliday and Resnik, Physics, Vol. 2.
3. D J Grifith, Introduction to Electrodynamics (Prentice-Hall of India).
4. Raitz and Milford, Electricity and Magnetism (Addison-Wesley).
5. A S Mahajan and A A Rangwala, Electricity and Magnetism (Tata Mc Graw-hill).
6. A M Portis, Electromagnetic fields.
7. Pugh & Pugh, Principles of Electricity and Magnetism (Addison-Wesley).
8. Panofsky and Phillips, Classical Electricity and Magnetism, (India Book House).
9. S S Atwood, Electricity and Magnetism (Dover).

Session 2019-20

PHYSICS

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

GROUP-A

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by inertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillations under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y, k, η by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a cantilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP-B

1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
18. To find the product of two matrices.
19. Numerical solution of equation of motion.
20. To find the roots of quadratic equation.

TEXT AND REFERENCE BOOKs:

1. B saraf et al Mechanical Systems(Vikas publishing House,New Delhi).
2. D.P. khandelwal, A Laboratory Manual of Physics for Undergraduate classes (Vani Publication House,New Delhi).
3. C G Lambe Elements of statistics (Longmans Green and Co London New York, Tprpnto).
4. C Dixon, Numerical analysis.
5. S Lipsdutz and A Poe, schaum's outline of theory and problems of programming with Fortran (MC Graw-Hill Book Company, Singapore 1986).

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
NEW CURRICULUM OF B.Sc. PART I
Session 2019-20
CHEMISTRY

The new curriculam will comprise of three theory papers of 33, 33 and 34 marks each and practical work of 50 marks. The curriculam is to be completed in 180 working days as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.The theory papers are of 60 hrs each duration and the practical work of 180 hrs duration.

PAPER I
INORGANIC CHEMISTRY

60Hrs. M.M.33

UNIT-I

A. ATOMIC STRUCTURE

Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES

Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

a) Atomic and ionic radii,
b) Ionization enthalpy,
c) Electron gain enthalpy,
d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.
e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

UNIT-II

CHEMICAL BONDING I

Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation energy and solubility of ionic solids, polarising power & polarisabilitry of ions, Fajans rule, Ionic character in covalent compounds: Bond moment and dipole moment, Percentage ionic character from dipole moment and electronegatiity difference, Metallic bond-free electron, Valence bond & band theories.

UNIT-III

CHEMICALBONDING II

Covalent bond: Lewis structure, Valence bond theory and its limitations, Concept of hybridization, Energetics of hybridization, equivalent and non-equivalent hybrid orbitals. Valence shell electron pair repulsion theory (VSEPR), shapes of the following simple molecules and ions containing lone pairs and bond pairs of electrons: H_2O, NH_3, PCl_3, PCl_5, SF_6. H_3O^+, SF_4, ClF_3, and ICl_2^- Molecular orbital theory. Bond order and bond strength, Molecular orbital diagrams of diatomic and simple polyatomic molecules N_2, O_2, F_2, CO, NO.

UNIT-IV

A. s-BLOCK ELEMENTS

General concepts on group relationships and gradation properties, Comparative study, salient features of hydrides, solvation & complexation tendencies including their function in biosystems and introduction to alkyl & aryls, Derivatives of alkali and alkaline earth metals

B. p-BLOCK ELEMENTS

General concepts on group relationships and gradation properties. Halides, hydrides, oxides and oxyacids of Boron, Aluminum, Nitrogen and Phosphorus. Boranes, borazines, fullerenes, graphene and silicates, interhalogens and pseudohalogens.

UNIT-V

A CHEMISTRY OF NOBLE GASES

Chemical properties of the noble gases, chemistry of xenon, structure, bonding in xenon compounds

B. THEORETICAL PRINCIPLES IN QUALITATIVE ANALYSIS (H_2S SCHEME)

Basic principles involved in the analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II.

REFERENCE BOOKS:

1. Lee, J. D. Concise Inorganic Chemistry ELBS, 1991.
2. Douglas, B.E. and McDaniel, D.H. Concepts & Models of Inorganic Chemistry Oxford, 1970
3. Atkins, P.W. & Paula, J. Physical Chemistry, 10th Ed., Oxford University Press, 2014.
4. Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications, 1962.
5. Rodger, G.E. Inorganic and Solid State Chemistry, Cengage Learning India Edition, 2002.
6. Puri, B. R., Sharma, L. R. and Kalia, K. C., Principles of Inorganic Chemistry, Milestone Publishers/ Vishal Publishing Co.; 33rd Edition 2016
7. Madan, R. D. Modern Inorganic Chemistry, S Chand Publishing, 1987.

PAPER: II

ORGANIC CHEMISTRY

UNIT-I BASICS OF ORGANIC CHEMISTRY

Hybridization, Shapes of molecules, Influence of hybridization on bond properties. Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment. Electrophiles and Nucleophiles; Nucleophilicity and basicity; Homolytic and Heterolytic cleavage, Generation, shape and relative stability of Carbocations, Carbanions, Free radicals, Carbenes and Nitrenes. Introduction to types of organic reactions: Addition, Elimination and Substitution reactions.

UNIT-II INTRODUCTION TO STEREOCHEMISTRY

Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with two or more chiral-centres, Diastereoisomers, meso compounds, Relative and absolute configuration: Fischer, Newmann and Sawhorse Projection formulae and their interconversions; Erythrose and threose, D/L, d/l system of nomenclature, Cahn-Ingold-Prelog system of nomenclature (C.I.P rules), R/S nomenclature. Geometrical isomerism: cis–trans, syn-anti and E/Z notations.

UNIT-III CONFORMATIONAL ANALYSIS OF ALKANES

Conformational analysis of alkanes, ethane, butane, cyclohexane and sugars. Relative stability and Energy diagrams. Types of cycloalkanes and their relative stability, Baeyer strain theory: Theory of strainless rings, Chair, Boat and Twist boat conformation of cyclohexane with energy diagrams; Relative stability of mono-substituted cycloalkanes and disubstituted cyclohexane.

UNIT-IV CHEMISTRY OF ALIPHATIC HYDROCARBONS

A. Carbon-Carbon sigma (σ) bonds

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reaction, Free radical substitutions: Halogenation-relative reactivity and selectivity.

B. Carbon-Carbon Pi (л) bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations.

Reactions of alkenes: Electrophilic additions and mechanisms (Markownikoff/Anti -Markownikoff addition), mechanism of oxymercuration-demercuration, hydroboration-oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation (oxidation). 1,2-and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene.

Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes.

UNIT-V AROMATIC HYDROCARBONS

Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/ carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directive effects of the groups.

REFERENCE BOOKS:

1. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd.(Pearson Education).
2. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
4. Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds, Wiley: London, 1994.
5. Kalsi, P. S. Stereochemistry Conformation and Mechanism, New Age International, 2005.
6. McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.
7. Organic Chemistry, Paula Y. Bruice, 2nd Edition, Prentice-Hall, International Edition (1998).
8. A Guide Book of Reaction Mechanism by Peter Sykes.

PAPER - III
PHYSICAL CHEMISTRY

M.M.34

UNIT-I
MATHEMATICAL CONCEPTS FOR CHEMIST

Basic Mathematical Concepts: Logarithmic relations, curve sketching, linear graphs, Properties of straight line, slope and intercept, Functions, Differentiation of functions, maxima and minima; integrals; ordinary differential equations; vectors and matrices; determinants; Permutation and combination and probability theory, Significant figures and their applications.

UNIT-II
GASEOUS STATE CHEMISTRY

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path; Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Joule Thomson effect, Liquification of Gases.

Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor (Z), and its variation with pressure and temperature for different gases. Causes of deviation from ideal behaviour. van der Waals equation of state, its derivation and application in explaining real gas behaviour, calculation of Boyle temperature. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state, relation between critical constants and van der Waals constants, law of corresponding states.

UNIT-III

A. LIQUID STATE CHEMISTRY

Intermolecular forces, magnitude of intermolecular force, structure of liquids, Properties of liquids, viscosity and surface tension.

B. COLLOIDS and SURFACE CHEMISTRY

Classification, Optical, Kinetic and Electrical Properties of colloids, Coagulation, Hardy Schulze law, flocculation value, Protection, Gold number, Emulsion, micelles and types, Gel, Syneresis and thixotrophy, Application of colloids.

Physical adsorption, chemisorption, adsorption isotherms (Langmuir and Freundlich). Nature of adsorbed state. Qualitative discussion of BET.

UNIT-IV

SOLID STATE CHEMISTRY

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, qualitative idea of point and space groups, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Crystal defects.

UNIT-V

A. CHEMICAL KINETICS

Rate of reaction, Factors influencing rate of reaction, rate law, rate constant, Order and molecularity of reactions, rate determining step, Zero, First and Second order reactions, Rate and Rate Law, methods of determining order of reaction, Chain reactions.

Temperature dependence of reaction rate, Arrhenius theory, Physical significance of Activation energy, collision theory, demerits of collision theory, non mathematical concept of transition state theory.

B. CATALYSIS

Homogeneous and Heterogeneous Catalysis, types of catalyst, characteristic of catalyst, Enzyme catatysed reactions, Micellar catatysed reactions, Industrial applications of Catalysis.

REFERENCE BOOKS:

1. Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 10th Ed., Oxford University Press (2014).
2. Ball, D. W. Physical Chemistry Thomson Press, India (2007).
3. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
4. Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
5. Engel, T. & Reid, P. Physical Chemistry 3rd Ed. Pearson (2013).
6. Puri, B.R., Sharma, L. R. and Pathania, M.S., Principles of Physical Chemistry, Vishal Publishing Co., 47th Ed. (2016).
7. Bahl, A., Bahl, B.S. and Tuli, G.D. Essentials of Physical Chemistry, S Chand Publishers (2010).
8. Rakshit P.C., Physical Chemistry, Sarat Book House Ed. (2014).
9. Singh B., Mathematics for Chemist, Pragati Publications.

PAPER - IV
LABOBATORY COURSE

INORGANIC CHEMISTRY

A. Semi-micro qualitative analysis (using H_2S or other methods) of mixtures - not more than four ionic species (two anions and two cations, excluding interfering, insoluble salts) out of the following:
Cations : NH_4^+, Pb^{2+}, Bi^{3+}, Cu^{2+}, Cd^{2+}, Fe^{3+}, Al^{3+}, Co^{2+}, Ni^{2+}, Mn^{2+}, Zn^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Na^+
Anions : CO_3^{2-} , S^{2-}, SO_3^{2-}, $S_2O_3^{2-}$, NO_2^-, CH_3COO^-, Cl^-, Br^-, I^-, NO_3^-, SO_4^{2-}
(Spot tests may be carried out wherever feasible)

B. Acid-Base Titrations

- Standardization of sodium hydroxide by oxalic acid solution.
- Determination of strength of HCl solution using sodium hydroxide as intermediate.
- Estimation of carbonate and hydroxide present together in mixture.
- Estimation of carbonate and bicarbonate present together in a mixture.
- Estimation of free alkali present in different soaps/detergents

C. Redox Titrations

- Standardization of $KMnO_4$ by oxalic acid solution.
- Estimation of Fe(II) using standardized $KMnO_4$ solution.
- Estimation of oxalic acid and sodium oxalate in a given mixture.
- Estimation of Fe(II) with $K_2Cr_2O_7$ using internal (diphenylamine, anthranilic acid) and external indicator.

D. Iodo / Iodimetric Titrations

- Estimation of Cu(II) and $K_2Cr_2O_7$ using sodium thiosulphate solution iodimetrically.
- Estimation of (a) arsenite and (b) antimony iodimetrically.
- Estimation of available chlorine in bleaching powder iodometrically.
- Estimation of Copper and Iron in mixture by standard solution of $K_2Cr_2O_7$ using sodium thiosulphate solution as titrants.

ORGANIC CHEMISTRY

1. Demonstration of laboratory Glasswares and Equipments.
2. Calibration of the thermometer. 80^o–82^o (Naphthalene), 113.5^o–114^o (Acetanilide), 132.5^o-133^o (Urea), 100^o (Distilled Water).)

3. Purification of organic compounds by crystallization using different solvents.
   - Phthalic acid from hot water (using fluted filter paper and stemless funnel).
   - Acetanilide from boiling water.
   - Naphthalene from ethanol.
   - Benzoic acid from water.

4. Determination of the melting points of organic compounds.

   Naphthalene 80°–82°, Benzoic acid 121.5°–122°, Urea 132.5°–133° Succinic acid 184.5°–185°, Cinnamic acid 132.5°–133°, Salicylic acid 157.5°–158°, Acetanilide 113.5°–114°, m-Dinitrobenzene 90°, p-Dichlorobenzene 52°, Aspirin 135°.

5. Effect of impurities on the melting point – mixed melting point of two unknown organic compounds.
   - Urea – Cinnamic acid mixture of various compositions (1:4, 1:1, 4:1).

6. Determination of boiling point of liquid compounds. (boiling point lower than and more than 100 °C by distillation and capillary method).
   - Ethanol 78°, Cyclohexane 81.4°, Toluene 110.6°, Benzene 80°.

i. Distillation (Demonstration)
   - Simple distillation of ethanol-water mixture using water condenser.
   - Distillation of nitrobenzene and aniline using air condenser.

ii. Sublimation
   - Camphor, Naphthalene, Phthalic acid and Succinic acid.

iii. Decolorisation and crystallization using charcoal.
   - Decolorisation of brown sugar with animal charcoal using gravity filtrations crystallization and decolorisation of impure naphthalene (100 g of naphthalene mixed with 0.3 g of Congo red using 1 g of decolorizing carbon) from ethanol.

7. Qualitative Analysis

   Detection of elements (N, S and halogens) and functional groups (Phenolic, Carboxylic, CarbonyI, Esters, Carbohydrates, Amines, Amides, Nitro and Anilide) in simple organic compounds.

PHYSICAL CHEMISTRY

1. Surface tension measurements.
   - Determine the surface tension by (i) drop number (ii) drop weight method.
   - Surface tension composition curve for a binary liquid mixture.

2. Viscosity measurement using Ostwald's viscometer.
   - Determination of viscosity of aqueous solutions of (i) sugar (ii) ethanol at room temperature.

- Study of the variation of viscosity of sucrose solution with the concentration of solute.
- Viscosity Composition curve for a binary liquid mixture.

3. Chemical Kinetics
    - To determine the specific rate of hydrolysis of methyl/ethyl acetate catalysed by hydrogen ions at room temperature.
    - To study the effect of acid strength on the hydrolysis of an ester.
    - To compare the strengths of HCl & H_2SO_4 by studying the kinetics of hydrolysis of ethyl acetate.
4. Colloids
    - To prepare colloidal solution of silver nanoparticles (reduction method) and other metal nanoparticles using capping agents.

Note: Experiments may be added/ deleted subject to availability of time and facilities

PRACTICAL EXAMINATION

05 Hrs. M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry) **12 marks**
2. Detection of functional group in the given organic compound and determine its MPt/BPt. **8 marks**

   O R

   Crystallization of any one compound as given in the prospectus along with the Determination of mixed MPt.

   O R

   Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.
3. Any one physical experiment that can be completed in two hours including calculations. **14 marks**
4. Viva **10 marks**
5. Sessionals **06 marks**

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.
3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

Hemchand Yadav Vishwavidyala, Durg (C.G.)

Zoology

B.Sc. Part I (2019-20)

Paper I

(Cell Biology and Non-chordata)

Unit:I

1. The cell (Prokaryotic and Eukaryotic)
2. Organization of Cell: Extra-nuclear and nuclear
   Plasma membrane, Mitochondria, Endoplasmic reticulum, Golgi body, Ribosome and Lysosome).
3. Nucleus, Chromosomes, DNA and RNA

Unit:II

1. Cell division (Mitosis and Meiosis).
2. An elementary idea of Cancer cells And Cell transformation.
3. An elementary idea of Immunity: Innate & Acquired Immunity, Lymphoid organs, Cells of Immune System, Antigen, antibody and their interactions

Unit:III

- General characters and classification of Phylum Protozoa, Porifera, and Coelenterata up to order.

2. Protozoa: Type study - Paramecium,
2. Porifera: Type study - Sycon.
3. Coelenterata: Type study - Obelia

.

Unit: IV

- General characters and classification of Phylum Platyhelminthes, Nemathelminthes, Annelida and Arthropoda up to order.

2. Platyhelminthes and Nemathelminthes: Type Study – Fasciola, Ascaris
3. Annelida: Type Study - Pheretima.
4. Arthropoda: Type Study - Palaemone.

Unit:V

- General characters and classification of Phylum Mollusca and Echinodermata up to order.

2. Mollusca: Type Study - Pila.
3. Echinodermata- Type Study- Asterias (Starfish).

14.6.19

14.06.19

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Zoology
B.Sc. Part I (2019-20)
Paper II
(Chordata and Embryology)

Unit:I

1. Classification of Hemichordata
2. Hemichordata- Type study-Balanoglossus
3. Classification of Chordates upto orders..
4. Protochordata-Type study - Amphioxus.
5. A comparative account of Petromyzon and Myxine.

Unit-II

1. Fishes-Skin & Scales, migration in fishes, Parental care in fish.
2. Amphibia-Parental care and Neoteny.
3. Reptilia- Poisonous & Non-poisonous Snakes, Poison apparatus, snake venom and Extinct Reptiles

Unit-:III

1. Birds- Flight Adaptation, Migration, and Perching mechanism, Discuss-Birds are glorified reptiles.
2. Mammals-Comparative account of Prototheria, Metatheria, Eutheria and Affinities.
3. Aquatic Mammals and their adaptations.

Unit:IV

1. **Fertilization**
2. Gametogenesis, Structure of gamete and Typesof eggs
3. Cleavage
4. Development of Frog up to formation of three germ layers.
5. Parthenogenesis

Unit:V

1. Embryonic induction, Differentiation and Regeneration.
2. Development of Chick (a) up to formation of three germ layers, (2) Extra-embryonic membranes.
3. Placenta in mammals.

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Zoology
B.Sc. Part I (2019-20)
Practical

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-

- Dissection of Earthworm, Cockroach, Palaemon and Pila
- Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.

(Alternative methods: By Clay/Thermacol/drawing/Model etc.)

- Adaptive characters of Aquatic, terrestrial, aerial and desert animals.
- Museum specimen invertebrate
- Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme of Practical Exam	**Time: 3hrs**
1. Major Dissection	10 Marks
2. Minor Dissection	05 Marks
3. Comments on Excersice based on Adaptation	04 Marks
4. Cytological Preparation	05 Marks
5. Spots-8 (Slides-4, Specimens-4)	16 Marks
6. Sessional	10 Marks

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B.Sc.– I (BOTANY) PAPER-I

BACTERIA, VIRUSES, FUNGI, LICHENS AND ALGAE

UNIT-I

VIRUSES: General characteristics, types of viruses based on structure and genetic material. Multiplication of viruses (General account), Lytic and Lysogenic cycle. Economic importance. Structure and multiplication of Bacteriophages. General account of Viroids, Virusoids, Prions, and Cyanophages. Mycorrhiza-Types and Significance.

UNIT –II

BACTERIA: General characteristics and classification (on the basis of morphology), fine structure of bacterial cell, Gram positive and Gram negative bacteria, mode of nutrition and reproduction vegetative, asexual and recombination (Conjugation, transformation and transduction), Economic importance. Microbial Biotechnology, *Rhizobium, Azatobactor, Anabena.*

UNIT-III

FUNGI: General account of habit and habitat, structure (range of thallus organization), cell wall composition, nutrition and reproduction in fungi. Heterothallism and Parasexuality. Outlines of classification of fungi. Economic importance of fungi. Life cycles of *Saprolegnia, Albugo,, Aspergillus, Peziza, Agaricus, Ustilago, Puccinia, Alternaria and Cercospora*. VAM Fungi

UNIT-IV

ALGAE: Algae: General characters, range of thallus organization, Gaidukov phenomenon, reproduction, life cycle patterns and economic importance.Classification, Systematic position, occurrence, structure and life cycle of following genera : *Nostoc, Gloeocaspsa, Volvox,, Oedogonium, Vaucheria, Chara, Ectocarpus, Polysiphonia.*

UNIT –V

Lichens- General account, types, structure, nutrition, reproduction and economic importance. Mycoplasma: Structure and importance. Blue Green Algae (BGA) in nitrogen economy of soil and reclamation of Ushar land.Mushroom Biotechnology

Books Recommended:

Dubey R.C. and Maheshwari D.K. ***A text book of Microbiology,*** S. Chand Publishing, New Delhi

Presscott, L. Harley, J.and Klein, D. ***Microbiology***, 7th edition, Tata Mc Graw-Hill Co.New Delhi.

Sharma P.D., ***Microbiology and Plant pathology,*** Rastogi Publication. New Delhi.

13.6.19 13.6.19 13/6/19 13.6.19

Alexopolous, C.J. Mims, C.W. and Blackwell, MM. ***Introduction to Mycology,*** John Wiley & Sons.

Dubey H.C. ***An Introduction to Fungi,*** Vikas Publishing, New Delhi

Mehrotra R.S. & Agrawal A., ***Plant Pathology,*** Tata McGraw, New Delhi

Sharma P.D. ***Plant Pathology***, Rastogi Publishers, Meruth.

Sristava, H.N. ***Fungi***, Pradeep Publications, Jalandhar

Webster, J. & Weber, R. ***Introduction to Fungi***, Cambridge University Press, Cambridge

Kumar H.D. ***Introduction to phycology***, Aff. East-west Press, New Delhi

Lee RE, ***Phycology***, Cambridge University Press U.K.

Srivastava, H.N., ***Algae***, Pradeep Publications, Jalandhar

Pandey S.K. Quick ***Concept of Botany***, Lambert Academic publishing, Germany

Pandey S.N., Mishra S,P. & Trivedi P.S. ***A Text Book of Botany*** (Vol.-I), Vikas Publishing, New Delhi

Singh, Pandey and Jain, ***A Text book of Botany,*** Rastogi Publication, Meerut.

(Dr. J.N. Verma)
Proff. & Head
Govt. D.B. Girls PG College
Raipur, (C.G.)

(Dr. Rekha Pimpalgaonkar)
Proff. & Head
Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

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B.Sc.-I (BOTANY) PAPER –II

(BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY)

UNIT –I

BRYOPHYTA: General characteristics, affinities, range of thallus organization, general classification and economic & ecological importance, Systematic position, occurrence, morphology anatomy and reproductive structure in *Riccia, Marchantia, Pellia, Anthoceros, Funaria.* Vegetative reproduction in Bryophytes, Evolution of sporophytes.

UNIT-II

PTERIDOPHYTES: General characteristics, affinities, economic importance and classification, Heterospory and seed habit, stellar system in Pteridophytes, Aposory and apogamy, Telome theory, *Azolla* as Biofertilizer.

UNIT-III

Systematic position, occurrence. Morphology, anatomy and reproductive structure of *Psilotum, Lycopodium, selaginella, Equisetum, Marsilea.*

UNIT-IV

Gymnosperm: General characteristics, affinities, economic importance and classification, Morphology, anatomy and reproduction in *Cycas, Pinus* and *Ephedra.*

UNIT-V

PALAEOBOTANY: Geological time scale, types of fossils and fossilization, Rhynia, study of some fossil gymnosperms. *Lygenopteris*

Books Recommended:

Parihar, N.S. ***The Biology and Morphology of Pteridophytes,*** Central Book Depot, Allahabad.

Parihar,N.S. ***An introduction to Bryophyta Vol.I:Bryophytes*** Central Book Depot, Allahabad.

Sambamurty,AVSS, ***A textbook of Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany***, IK International Publishers.

13.6.19 13.6.19 13/6/19 13.6.19

Pandey SN, Mishra SP and Trivedi PS ***A text Book of Botany (Vol.II)***, Vikas Publishing, New Delhi

Bhatanagar, SP and Moitra, A. ***Gymnosperm***, New Age International (P) Ltd., Publishers, New Delhi

Biswas C. and Johri BM, ***The Gymnosperms***, Springer-Verlag, Germany.

Srivastava, HN, ***Palaeobotany***, Pradeep Publications Jalandhar

Srivastava, HN, Bryophyta, Pradeep Publications Jalandhar

Singh, Pandey and Jain, ***A Text Book of Botany***, Rastogi Publication, Meerut

Sristava, HN, ***Fundamentals of Pteridophytes,*** Pradeep Publications, Jalandhar

B.Sc. I (BOTANY)

PRACTICAL

Study of external (Morphorgical) and internal (microscopic/anatomical) features of representative gerera given in the theory.

1. Algae: Gloeocapsa, Scytonema, Gloeotrichia, Volvox, Oedogonium, Vaucheria, Chara, Ectocarpus, Sargassum, Batrachosperrmum
2. Gram staining
3. Fungi: Albugo, Aspergillus, Peziza, Agaricus, Puccinia, Alternaria and Cercospora
4. Bryophyta: Riccia, Marchantia, Pellia, Anthoceros, Sphagnum, Funaria
5. Pteridophyta: Lycopodium, Selaginella, Equsetum, Marsilea.
6. Gymnosperm: Cycas, Pinus, Epherda.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Algae/Fungi/Gram Staining	10
2.	Bryophyta/Pteridophyta	10
3.	Gymnosperm	10
4.	Spotting	10
5.	Viva-Voce	05
6.	Sessional	05

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(Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

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MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.Sc. Part-I
MATHEMATICS
PAPER - I
ALGEBRA AND TRIGONOMETRY

UNIT-I Elementary operations on matrices, Inverse of a matrix. Linear independence of row and column matrices, Row rank, column rank and rank of a matrix. Equivalence of column and row ranks. Eigenvalues, eigenvectors and the characteristic equations of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix.

UNIT-II Application of matrices to a system of linear (both homogeneous and nonhomogeneous) equations. Theorems on consistency of a system of linear equations. Relation between the roots and coefficients of general polynomial equations in one variable. Transformation of equations. Descarte's rule of signs. Solutions of cubic equations (Cardons method), Biquadratic equation.

UNIT-III Mappings, Equivalence relations and partitions. Congruence modulo n. Definition of a group with examples and simple properties. Subgroups, generation of groups, cyclic groups, coset decomposition, Lagrange's theorem and its consequences. Fermat's and Euler's theorems. Normal subgroups. Quotient group, Permutation groups. Even and odd permutations. The alternating groups An. Cayley's theorem.

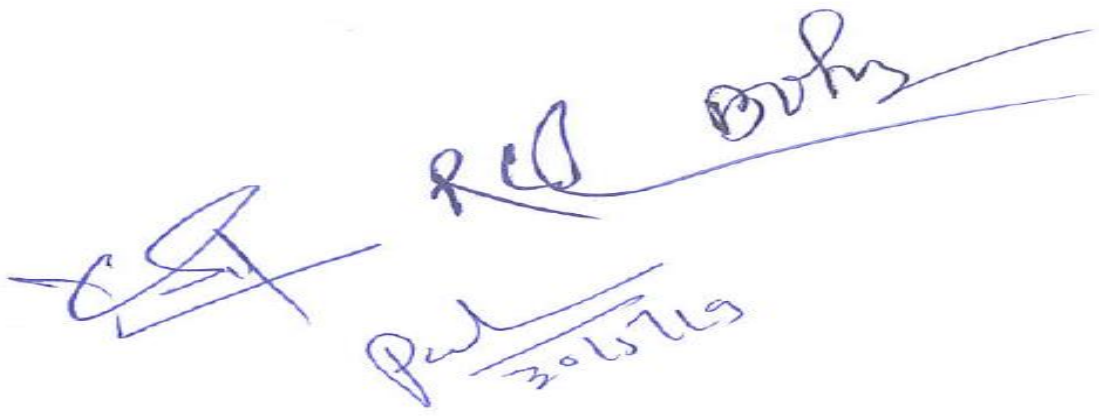
UNIT-IV Homomorphism and Isomorphism of groups. The fundamental theorems of homomorphism. Introduction, properties and examples of rings, Subrings, Integral domain and fields Characteristic of a ring and Field.

TRIGONOMETRY :

UNIT-V De-Moivre's theorem and its applications. Direct and inverse circular and hyperbolic functions. Logarithm of a complex quantity. Expansion of trigonometrical functions. Gregory's series. Summation of series.

TEXT BOOK :

1. I.N. Herstein, Topies in Algebra, Wiley Eastern Ltd., New Delhi, 1975
2. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd.New Delhi, 2000.
3. Chandrika Prasad, Text-Book on Algebra and Theory of equations, Pothishala Private Ltd., Allahabad.
4. S.L. Loney, Plane Trigonometry Part II, Macmillan and Company, London.



REFERENCES :

1. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, First Course in linear Algebra, Wiley Eastern, New Delhi, 1983.
2. P.B. Bhattacharya, S.K.Jain and S.R. Nagpaul, Basic Abstract Algebra (2 edition), Cambridge University Press, Indian Edition, 1997.
3. S.K. Jain, A. Gunawardena and P.B. Bhattacharya, Basic linear Algebra with MATLAB, Key College Publishing (Springer-Verlag), 2001.
4. H.S. Hall and S.R. Knight, Higher Algebra, H.M. Publications, 1994.
5. R.S. Verma and K.S. Shukla, Text Book on Trigonometry, Pothishala Pvt. Ltd., Allahabad.

B.Sc. Part-I

MATHEMATICS

PAPER - II

CALCULUS

DIFFERENTIAL CALCULUS :

UNIT-I $\varepsilon - \delta$ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuties. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

UNIT-II Asymptotes. Curvature. Tests for concavity and convexity. Points of inflexion. Multiple points. Tracing of curves in cartesian and polar coordinates.

INTEGRAL CALCULUS:

UNIT-III Integration of transcendental functions. Reduction formulae. Definite integrals. Quadrature. Rectification. Volumes and surfaces of solids of revolution.

ORDINARY DIFFERENTIAL EQUATIONS :

UNIT-IV Degree and order of a differential equation. Equations reducible to the linear form. Exact differential equations. First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations.

UNIT-V Linear differential equations of second order. Transformation of the equation by changing the dependent variable/the independent variable. Method of variation of parameters. Ordinary simultaneous differential equations.

TEXT BOOK :

1. Gorakh Prasad, Differential Calculaus, Pothishala Private Ltd. Allahabad.
2. Gorakh Prasad, Integral Calculus, Pothishala Private Ltd. Allahabad.
3. D.A. Murray Introductory Course in Differential Equations, Orient Longman (India), 1976.

REFERENCES :

1. Gabriel Klambauer, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum's outline series, Schaum Publishing Co. New York.
3. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
4. P.K. Jain and S.K. Kaushik, An Introduction to Real Analysis, S. Chand & Co. New Delhi, 2000.
5. G.F. Simmons, Differential Equations, Tata Mc Graw Hill, 1972.
6. E.A. Codington, An Introduction to Ordinary Differential Equations, Prentics Hall of India, 1961.
7. H.T.H. Piaggio, Elementary Treatise on Differential Equations and their Applications, C.B.S. Publishe & Distributors, Dehli, 1985.
8. W.E. Boyce and P.O. Diprima, Elementary Differential Equations and Boundary Value Problems, John Wiley, 1986.
12. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley and Sons, 1999.

B.Sc. Part-I

MATHEMATICS

PAPER - III

VECTOR ANALYSIS AND GEOMETRY

VECTOR ANALYSIS :

UNIT-I Scalar and vector product of three vectors. Product of four vectors. Reciprocal Vectors. Vector differentiation. Gradient, divergence and curl.

UNIT-II Vector integration. Theorems of Gauss, Green, Stokes and problems based on these.

UNIT-III General equation of second degree. Tracing of conics. System of conics. Confocal conics. Polar equation of a conic.

UNIT-IV Sphere. Cone. Cylinder.

UNIT-V Central Conicoids. Paraboloids. Plane sections of conicoids. Generating lines. Confocal Conicoids. Reduction of second degree equations.

TEXT BOOKS :

1. N. Saran and S.N. Nigam, Introduction to vector Analysis, Pothishala Pvt. Ltd. Allahabad.
2. Gorakh Prasad and H.C. Gupta, Text Book on Coordinate Geometry, Pothishala Pvt. Ltd., Allahabad.
3. R.J.T. Bell, Elementary Treatise on Coordinate Geometry of three dimensions, Machmillan India Ltd. 1994.

REFERENCES :

1. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Company, New York.
2. Murray R. Spiegel, Vector Analysis, Schaum Publishing Company, New York.
3. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, 1999.
4. Shanti Narayan, A Text Book of Vector Calculus, S. Chand & Co., New Delhi.
5. S.L. Loney, The Elements of Coordinate Geometry, Macmillan and Company, london.
6. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of two Dimensions, Wiley Eastern Ltd., 1994.
7. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of three Dimensions, Wiley Eastern Ltd., 1999.
8. N. Saran and R.S. Gupta, Analytical Geometry of three Dimensions, Pothishala Pvt. Ltd. Allahabad.

MICROBIOLOGY

BSc-1st

Paper- I: General Microbiology & Basic Technique

UNIT-1: Fundamental, History & Developments

Introduction to major groups of microorganisms and fields of Microbiology; Historical development, Contributions of Pioneers (Louis Pasteur, Edward Jenner, Anton Von Leewenhoeck and Alexander Flemming). Beneficial and harmful microbes and its role in daily life.

UNIT-2: Basic Microbial Techniques

Methods of studying microorganism; Sterilization Techniques (Physical & Chemical Sterilization). Pure culture isolation Technique: Streaking,Waksman serial dilution and plating methods. cultivation, maintenance and preservation of pure cultures. Culture media & conditions for microbial growth. Staining technique: simple staining, Differential (gram staining), negative staining and acid fast staining.

UNIT-3: Virology & Bacteriology

Diversity of microbial world; Principle and classification of Viruses and Bacteria. Structure, Multiplication and Economic importance of viruses (TMV, Influenza virus & T_4-Phage). Structure & Functional organization of Bacteria, Cell wall of Gram Positive & Gram Negative bacteria; Economic importance of Bacteria.

UNIT-4: Mycology

General characteristics and classification of Fungi; Structure and Reproduction of fungi (*Rhizopus, Penicillium, Aspergillus, Yeast & Agaricus*). Common fungal disease of crops (Late & Early blight of potato, Smut of Rice, Tikka and Red rot of Sugarcane). Structure, reproduction and economic aspect of Lichens.

UNIT-5: Phycology & Protozoology

General characteristics and classification of Algae and Protozoa; General account & economic importance of Cyanobacteria (*Microcystis, Ocillitoria, Nostoc & Anabaena)* and Protozoa *(Amoeba, Paramoecium, Euglena and plasmodium).*

Oscillatoria

Text Books Recommended:

1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey &Maheshwari.
3. Microbiology: An Introduction; G. Tor tora, B. Funke, C. Benjamin Cummings.
4. General Microbiology; Seventh edition by Hans G Schlegel, CambridgeUniversity Press.
5. Practical Microbiology; Dubey and Maheshwari.
6. Handbook of Microbiology; Bisen P.S., Varma K., CBS Publishers and Distributors, Delhi. General Microbiology by Brock.
7. General Microbiology by Pelzar et al.
8. Introduction on Microbial Techniques by Gunasekaran.

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Paper- II: Biochemistry and Physiology

UNIT-1: CARBOHYDRATES AND PROTEINS

Structure, classification and properties of Carbohydrates – Monosaccharide, Oligosaccharides (Disaccharides) and Polysaccharides. Structure, classification and properties of Protein - Amino acids, peptides and Proteins (Primary, Secondary, Tertiary and Quaternary structure).

UNIT-2: LIPIDS AND NUCLEIC ACIDS

Structure, classification and properties of Lipids; Saturated and Unsaturated fatty acids. Structure and properties of Nucleotides. Structure and forms of DNA; Replication of DNA. Types, Structure and Function of RNA.

UNIT-3: ENZYMES

Structure, Nomenclature, Classification and Properties of Enzymes. Mechanism of enzyme action, Enzyme kinetic: Michaelis-Menten. Equation & derivation, Enzyme inhibition, Lineweaver-Burk Plot (LB plot). Co-enzymes and their role; Allosteric enzymes and Isoenzyme. Extracellular enzymes and their role.

UNIT-4: MICROBIAL METABOLISM

Bacterial photosynthesis and Chemosynthesis: Glycolysis, TCA cycle and Oxidative Phosphorylation. Anaerobic catabolism of glucose; Fat Biosynthesis,alpha and beta oxidation of fatty acids. Deamination, trasns-amination and Urea cycle.

UNIT-5: GROWTH PHYSIOLOGY & TRANSPORT SYSTEM

Bacterial cell division, Genome replication and Growth Phases, Conditions for growth. Plasma membrane & Transport system, types of transport (Passive and active). Diffusion (simple & facilitated), Concept of Uniport, Antiport and Symport;

Text Books Recommended:

1. General Biochemistry by A.C. Deb.
2. Biochemistry by Lehninger (Kalyani publication)
3. Biochemistry by U. Satyanarayan.
4. Microbiology by Anantanarayan and Panikar.
5. Fundamentals of Biochemistry; J L Jain, Sunjay Jain, Nitin Jain; S. Chand & Company Ltd
6. Practical Biochemistry: Principles and Techniques; *5th Edition*; Keith Wilson and John Walker
7. Biophysical Biochemistry: Principles and Techniques; AvinashUpadhyay, KakoliUpadhyay and Nirmalendu Nath; Himalaya Publishing House.

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PRACTICAL

M. M. 50

Basic information about autoclave, hot air oven, laminar air flow and other laboratory instruments
Preparation of solid/liquid culture media.
Isolation of single colonies on solid media.
Enumeration of bacterial numbers by serial dilution and plating.
Simple and differential staining.
Measurement of microorganism (micrometry) and camera Lucida drawing of isolated organism.
Determination of bacterial growth by optical density measurement.
General and specific qualitative test for carbohydrates
General and specific qualitative test for amino acids
General and specific qualitative test for lipids
Estimation of protein
Estimation of blood glucose
Assay of the activity of amylases
Assay of the activity of Phosphates

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on Microbiological methods	10
2. Exercise on Biochemical tests	10
3. Exercise on staining method	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
Total	50

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Scheme of Examination

B.Sc. Part-01 Geology

कक्षा	प्रश्नपत्र	विषय समूह	सैद्धा. अंक	प्रायो. अंक	योग
BSc. I year	I	भूगतिकी एवं भू–आकृति विज्ञान (Geodynamics & Geomorphology)	50	50	150
	II	खनिज एवं क्रिस्टल विज्ञान (Mineralogy & Crystallography)	50		
BSc. II year	I	शैलिकी (Petrology)	50	50	150
	II	संरचनात्मक भूविज्ञान (Structural Geology)	50		
BSc. III year	I	जीवाश्म विज्ञान एवं संस्तर विज्ञान (Palaeontology & Stratigraphy)	50	50	150
	II	भूसंसाधन एवं व्यावहारिक भूविज्ञान (Earth Resources & Applied Geology)	50		

-: Note :-

प्रत्येक वर्ष के विद्यार्थियों हेतु पाठ्यक्रम में उल्लेखित भूवैज्ञानिक क्षेत्रीय अध्ययन अनिवार्य होगा।

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कक्षा / Class - B. Sc. – I
Session 2019-20
Paper –I
भूगतिकी एवं भूआकृति विज्ञान
(Geodynamics & Geomorphology)

इकाई– 01 (i) भूविज्ञान एवं परिप्रेक्ष्य; सौरमण्डल में सूर्य की स्थिति ; परिमाण, आकार, संहति, घनत्व।

(ii) पृथ्वी की उत्पत्ति

(iii) पृथ्वी की आंतरिक संरचना, भूपर्पटी, प्रवार एवं क्रोड

(iv) पृथ्वी की आयुः निर्धारण की विधियाँ, रेडियोधर्मी विधि

(v) वायुमण्डल, जलमण्डल एवं जैवमण्डल का निर्माण एवं संगठन

इकाई– 02 (i) प्लेटविवर्तनिकी का प्रारंभिक अध्ययन

(ii) महाद्वीपीय विस्थापन की अवधारणायें एवं सिद्धान्त

(iii) समस्थैतिकी की अवधारणायें एवं सिद्धान्त

(iv) समुद्रतल विस्तारण का साक्ष्य

(v) समुद्र, महाद्वीप एवं पर्वतों की उत्पत्ति

इकाई– 03 (i) भूकम्पः भूकम्प की पट्टियाँ, भूकम्प की तीव्रता

(ii) ज्वालामुखीः प्रकार एवं वितरण

(iii) अंतः समुद्रीपर्वतों, चापाकार द्वीपमालाओं एवं खाइयों का उद्भव, वितरण एवं महत्व

(iv) महाद्वीपीय तटीय क्षेत्रों की विवर्तनिकी : सक्रिय तट एवं सीमांतीय द्रोणियाँ

(v) नवविवर्तनिकी : सक्रियभ्रंश, अपवाह परिवर्तन

इकाई– 04 (i) भूआकृति विज्ञान की मूलभूत धारणायें

(ii) भूआकृतिक कारक एवं शैल अपक्षय की प्रक्रियायें,

(iii) नदी के भूवैज्ञानिक कार्य एवं नदीय भूआकृतियाँ

(iv) वायु के भूवैज्ञानिक कार्य एवं वायुजनित भूआकृतियाँ

(v) हिमनदों के भूवैज्ञानिक कार्य एवं हिमनदजनित भूआकृतियाँ

इकाई– 05 (i) समुद्र के भूवैज्ञानिक कार्य एवं तटीय भूआकृतियाँ
(ii) भूमिगत जल के भूवैज्ञानिक कार्य एवं कार्स्टस्थलाकृति
(iii) ज्वालामुखीय भूआकृतियाँ
(iv) पृथ्वी का उष्मा बजट एवं वैश्विक जलवायु परिवर्तन
(v) भारत का भूआकृतिक विभाजन

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प्रायोगिक कार्य –

(1) भूआकृतिक संरचनाओं को प्रदर्शित करने वाले प्रादर्शों का अध्ययन

(2) स्थलाकृतिक मानचित्रों का अध्ययन एवं विभिन्न पैमानों पर सूचक–निर्धारण की जानकारियॉ

(3) भूआकृतिक–मानचित्रों में विभिन्न भूआकृतियों एवं प्रवाह प्रणालियों का अध्ययन

(4) भारत के रेखित–मानचित्र में मुख्य पर्वतों, झीलों एवं नदियों को अंकित करना

(5) भारत के रेखित मानचित्र में भूकम्प प्रेक्षणालयों को अंकित करना

(6) भारतीय महाद्वीपों में आये भूकम्पों के अधिकेन्द्र एवं तीव्रता को मानचित्र में अंकित करना।

(7) आकारमितिक विश्लेषण

Suggested Readings:-

भौतिक–भूविज्ञान	–	डॉ. मुकुल घोष–
भौतिक–भूविज्ञान	–	जे.पी. तिवारी एव ंबी.के. सिंह–
भूआकृति–विज्ञान	–	डॉ. सविन्द्र सिंह
भूविज्ञान एक परिचय	–	डॉ. विद्यासागर दुबे
Physical Geology	-	Miller
Principles of physical geology	-	A. Holmes
An introduction to physical geology-		A.K. Dutta
Principles of Geomorphology	-	W.D. Thornbury
Principles of Geomorphology	-	A.F. Ahmed

Class- B. Sc. - I
Paper –I
(Geodynamics & Geomorphology)

Unit:1	(i)	Geology & it perspectives. Earth in the solar system; size, shape, mass & density.
	(ii)	Origin of Earth.
	(iii)	Internal structure of Earth, Crust, Mantle and Core.
	(iv)	Age of Earth: with special emphasis on Radioactive dating.
	(v)	Formation & composition of Hydrosphere, Biosphere & Atmosphere.
Unit:2	(i)	Elementary idea about Plate-Tectonics.
	(ii)	Concept & theories of continental-drift
	(iii)	Concept & theories of Isostasy.
	(iv)	Evidences of Sea-floor spreading.
	(v)	Origin of oceans, continents & mountains.
Unit:3	(i)	Earthquakes, Earthquake Belts, measurement of Earthquakes.
	(ii)	Volcanoes: Types & distribution.
	(iii)	Mid –oceanic- ridges, trenches & island arc; origin, distribution & importance.
	(iv)	Tectonics of continental margins; Active margins & marginal basins.
	(v)	Neo-tectonics; active faults, drainage changes.
Unit:4	(i)	Fundamental concepts of Geomorphology.
	(ii)	Geomorphic agents & processes of rock-weathering.
	(iii)	Geological work of rivers; fluvial landforms.
	(iv)	Geological work of wind; Aeolian landforms.
	(v)	Geological work of Glaciers; glacial landforms.
Unit:5	(i)	Geological work of oceans; coastal landforms.
	(ii)	Geological work of Ground water. Karst topography.
	(iii)	Volcanic landforms.
	(iv)	Earth's heat budget & global climatic changes.
	(vi)	Physiographic divisions of India.

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PRACTICALS:

(1) Study of models showing various Geomorphic features.

(2) Numbering, Indexing of topographic maps on various scales.

(3) Interpretation of various Geomorphic landforms & drainage pattern on topographic maps.

(4) Plotting of major mountain Ranges, Lakes & rivers on outline map of India.

(5) Plotting of seismic observatories on outline map of India.

(6) Plotting of epicenters & magnitude of major earthquakes of Indian subcontinent.

(7) Morphometric analysis.

Suggested Readings:-

भौतिक–भूविज्ञान	–	डॉ. मुकुल घोष–
भौतिक–भूविज्ञान	–	जे.पी. तिवारी एव ंबी.के. सिंह
भूआकृति–विज्ञान	–	डॉ. सविन्द्र सिंह
भूविज्ञान एक परिचय	–	डॉ. विद्यासागर दुबे
Physical Geology	-	Miller
Principles of physical geology	-	A. Holmes
An introduction to physical geology-		A.K. Dutta
Principles of Geomorphology	-	W.D. Thornbury
Principles of Geomorphology	-	A.F. Ahmed

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कक्षा / Class- B.Sc-I

Paper –II

खनिज एवं क्रिस्टल विज्ञान

(Mineralogy & Crystallography)

इकाई– 01

(i) खनिज एवं क्रिस्टल की परिभाषा।

(ii) क्रिस्टल संरचना एवं यूनिट सेल।

(iii) क्रिस्टल के तत्व, क्रिस्टल रूप।

(iv) क्रिस्टलीय अक्ष एवं अक्षीय कोण।

(v) क्रिस्टल नोटेशन, अन्तःखण्डीय अनुपात एवं सूचकांक

इकाई– 02

(i) क्रिस्टल विज्ञान के नियम।

(ii) क्रिस्टलीय सममिति।

(iii) क्रिस्टलों का वर्गीकरण। क्रिस्टल समुदायों के सामान्यवर्ग की सममिति।

(iv) सामान्य वर्ग के रूप।

(v) क्रिस्टलों में यमलन।

इकाई– 03

(i) प्रकाश की प्रकृति, प्रकाश का परावर्तन एवं अपवर्तन।

(ii) अपवर्तनांक, क्रांतिक कोण, पूर्ण आंतरिक परावर्तन एवं बेके प्रभाव।

(iii) द्वि–अपवर्तन, निकॉल प्रिज्म की रचना एवं कार्य प्रणाली।

(iv) ध्रुवण सूक्ष्मदर्शी : अवयव एवं कार्यप्रणाली।

(v) खनिजों के प्रकाशीय गुण।

इकाई– 04

(i) सिलिकेट संरचनाएं

(ii) खनिजों में बंध।

(iii) समाकृतिकता, बहुरूपता एवं कूटरूपता।

(iv) ठोस–विलयन

(v) खनिजों के भौतिक गुण।

इकाई– 05 निम्नलिखित खनिज समूहों के संगठन, भौतिक एवं प्रकाशकीय गुणों का अध्ययन–

(i) ऑलिवीन्, गार्नेट एवं अभ्रक समूह।
(ii) पायरॉक्सीन।
(iii) एम्फीबोल।
(iv) फेल्सपार।
(v) सिलिका।

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प्रायोगिक कार्य–

(1) क्रिस्टल मॉडल में सममिति तत्वों का अध्ययन।

(2) सातों क्रिस्टल समुदायों की सामान्य वर्ग की मूल आकृतियों का अध्ययन।

(3) यूलर प्रमेय का सत्यापन।

(4) प्रमुख शैलकर खनिजों का स्थूलदर्शी अध्ययन।

(5) ध्रुवण–सूक्ष्मदर्शी की सहायता से प्रमुख शैलकर खनिजों के प्रकाशीय गुणों का अध्ययन।

(6) सात दिवसीय भूवैज्ञानिक क्षेत्रीय अध्ययन

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Class- B.Sc.-I
Paper –II
(Mineralogy & Crystallography)

Unit:1
(i) Definition of Mineral and Crystal.
(ii) Crystal structures, Unit cells
(iii) Elements of crystal. Crystal forms.
(iv) Crystallographic axes and axial angles.
(v) Parameters and indices of crystal notation

Unit:2
(i) Laws of Crystallography
(ii) Crystal symmetry
(iii) Classification and symmetry of normal classes of seven crystal systems
(iv) Forms of normal classes.
(v) Twinning in crystals

Unit:3
(i) Nature of light : reflection and refraction of light.
(ii) Refractive index. Critical angle. Total internal reflection and Becke effect.
(iii) Double refraction. Nicol prism, it's construction and working.
(iv) Polarizing Microscope- its parts & functions.
(v) Optical properties of minerals.

Unit:4
(i) Silicate structures.
(ii) Bonding in Minerals.
(iii) Isomorphism. Polymorphism and Pseudomorphism.
(iv) Solid solution
(v) Physical properties of minerals

Unit:5 Study of Composition, physical and optical properties of the following Mineral groups:
(i) Olivine, Garnet and Mica groups.
(ii) Pyroxenes
(iii) Amphiboles
(iv) Feldspars
(v) Silica

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PRACTICALS-

(1) Study of symmetry elements in crystal models.

(2) Study of fundamental forms of normal classes of all seven crystal systems.

(3) Verification of Euler's theorem.

(4) Study of physical properties of rock forming minerals.

(5) Study of the optical properties of important rock forming minerals using polarizing Microscope.

(6) Geological excursion for seven days.

Suggested Readings:

Rutley's elements of Mineralogy	:	Read, H.H.
Dana's text book of Mineralogy	:	Ford W.E.
खनिज तथा क्रिस्टल विज्ञान	–	डॉ. बी. सी. जैश
खनिज विज्ञान के सिद्धांत	–	डॉ. ए. पी. अग्रवाल
प्रायोगिक भू–विज्ञान (भाग–1)	–	डॉ. र. प्र. मांजरेकर
प्रकाशीय खनिज विज्ञान के मूल तत्व	–	विंचेल

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B.A./B.Sc. – First Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - First

Name of the Paper :- FOUNDATION OF ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Anthropology. History of Anthropology. Branches of Anthropology -

(a) Socio-cultural Anthropology
(b) Physical Biological Anthropology
(c) Archaeological Anthropology
(d) Linguistic Anthropology

UNIT – II Relationship of Anthropology with other disciplines: Life Sciences, Medical Sciences, Social Sciences: History, Economics, Sociology, Psychology, Political Science

UNIT – III Foundation in Biological Anthropology

(a) Human Evolution with respect to Hominid fossils
(b) Human Variation: Types and causes
(c) Human Genetics: Concept, scope and branches
(d) Human growth and development: Definition, scope, methods and factors effecting human growth and development

UNIT – IV Fundamentals in Social-Cultural Anthropology.

(a) Culture, Society, Community, Group, Institution
(b) Human Institution:-
Family: Definiton, types and function of family
Marriage: Definition, forms of marriage and its functions
Kinship: Definition, types and functions
Religion: Theories on the origin of religion
(c) Basic techniques of data collection :
Observation , Schedule, Questionnaire, Geneology

UNIT – V Fundamentals in Archaeological Anthropology.

(a) Tool typology & Technology: Paleolithic, Mesolithic & Neolithic
(b) Cultural evolution: Broad outlines of cultures (Stone age to metal age)
(c) Dating techniques in archaeology

20/06/19

B.A. /B.Sc. – First Year

Session: 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	Second
Name of the Paper	:-	PHYSICAL/ BIOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I	Meaning, scope, History of Physical Anthropology & its applied aspects Theories of organic evolution: Lamarckism, Neo-lamarckism, Darwinism, Neo-darwinism & Synthetic theory of evolution
UNIT – II	Position of Man in animal kingdom, Classification of living primates, Comparative anatomy of Man and Apes (with special reference to skull, pelvis, dentition and long bones)
UNIT – III	Fossil evidence of human evolution: Ramapithecus, Australopithecus, Pithecanthropus, Sinanthropus, Neanderthal, Cromagnon, Grimaldi man, Chancelade man.
UNIT – IV	Concept of Race: Race formation and Criteria of racial classification, UNESCO Statement, Racial element in India, Major races of the world.
UNIT – V	Human Genetics: **a.** Structure of Chromosome, DNA & RNA **b.** Mendelian principle. **c.** Types of Inheritance in Human

20/06/19

B.A./B.Sc. – First Year

Session : 2018-19

Name of the Subject	:-	Anthropology
Paper	: -	Practical
Name of the Paper	:-	OSTEOLOGY AND CRANIOMETRY

Total Marks : 50 Pass Marks : 17

I. Identification of bones of human Skeleton. Sketching and labeling of various normas of skull, Overview of Pectoral & Pelvic girdles, Femur & Humerus bone

II. Craniometry :-
1. Maximum Cranial length.
2. Maximum Cranial Breadth.
3. Maximum frontal Breadth.
4. Bizygomatic Breadth.
5. Nasal Height.
6. Nasal Breadth
7. Minimum frontal breadth
8. Bimaxillary Breadth.
9. Maximum Biorbital Breadth
10. Length of magnum foramen.

III. Craniometric indices :
1. Cranial Index
2. Nasal Index

20/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A. /B.Sc. –I
Subject-Statistics
Paper – I (Paper Code-0803)
PROBABILITY THEORY

Unit-I
Important concepts in probability: Random experiment: trial, sample point and sample space, event, Operations of events, concepts of mutually exclusive and exhaustive events. Definition of probability: classical and relative frequency approach. Richard Von Misses, Cramer and Kolmogrove approachesto probability, merits and demerits to these approaches, any general idea to be given. Discrete probability space, Properties of probability based on axiomatic approaches, Independence of events, Conditional probability, total and compound probability rules, Baye's theorem and its applications.

Unit-II
Random variables: Definition of discrete random variable (rv); probability mass function (pmf) and cumulative distribution function (cdf). Joint pmf of several discrete rvs. Marginal and conditional pmfs. Independence of rvs. Idea of continuous random variables, probability density function, illustration of random variables and its properties. Expectation of a random variable and its properties -moments, measures of location and dispersion, skewness and kurtosis, Moment generating function, raw and central moments, Probability generating function (pgf) and, their properties and uses.

Unit-III
Standard univariate discrete distributions: degenerate, discrete uniform, hypergeometric, Poisson, geometric and negative binomial distributions. Marginal and conditional distributions, Distributions of functions of discrete rvs, reproductive property of standard distributions.

Unit-IV
Univariate continuous distributions and their properties: Uniform, Beta, Gamma, Exponential, Normal, Cauchy, Lognormal. Moment generating function (mgf) : its properties and applications.
Tchebycheff's inequality and applications, statements and applications of weak law of large numbers and central limit theorems.

Unit-V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.
2.Chung, K.L. (1979). Elementary Probability Theory with Stochastic Processes, Springer International Student Edition.
3. Edward P.J., Ford J.S. and Lin (1974): Probability for Statistical Decision-Marketing. Prentice Hall
4. Goon A.M., Gupta M.K. and Dasgupta B.(1999): Fundamentals of Statistics, Vol. I , World Press, Calcutta
5. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, Mc. Graw Hall.

ADDITIONAl REFERENCES:

6. Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.
7.David Stirzaker (1994). Elementary Probability, Cambridge University Press.
8.Feller, W. (1968). An Introduction to Probability Theory and its Applications, Wiley.
9. Hoel P.G. (1971): Introduction to Mathematical Statistics
10. Mayer P.L. (1970): Introductory Probability and Statistical Applications, Addition Wesley
11.Mukhopadhyay, P. (1996). Mathematical Statistics, New Central Book Agency, Calcutta.
12.Parzen, E. (1960). Modern Probability Theory and its Applications, Wiley Eastern.
13Pitman, Jim (1993). Probability, Narosa Publishing House.

Paper – II(Paper Code-0804)
DESCRIPTIVE STATISTICS

Unit - I

Origin and Development of statistical importance, uses and limitations of Statistics. Types of Data: Concepts of a statistics population and sample from a population; qualitative and quantitative data; nominal and ordinal data; cross sectional and time series data; discrete and continuous data; frequency and non-frequency data.

Collection and Scrutiny of Data; Primary data – designing a questionnaire and a schedule; checking their consistency. Secondary data – their major sources including some government publications. Complete enumeration, controlled experiments, observational studies and sample surveys. Scrutiny of data for internal consistency and detection of errors of recording. Ideas of cross-validation.

Presentation of Data: Construction of tables with one or more factors of classification. Diagrammatic and graphical representation of non-frequency data. Frequency distributions, cumulative frequency distributions and their graphical and diagrammatic representation – column diagram, histogram, frequency polygon and ogives. Stem and leaf chart. Box plot.

Unit -II

Analysis of Quantitative Data: Univariate data: Concepts of central tendency or location, and their measures; arithmetic, geometric and harmonic mean, median and mode.

Unit -III

Dispersion and relative measures of dispersion, skewness and kurtosis, and their measures including those based on quartiles and moments. Sheppard's corrections for moments for grouped data (without deviation).

Unit -IV

Bivariate data: Scatter diagram. Product moment correlation coefficient and its properties. Coefficient of determination. Correlation ratio. Concepts of regression. intra - class correlation coefficient with equal and unequal group sizes. Rank correlation – Spearman's and Kendall's measures. Correlation index. Principle of least squares. Fitting of linear and quadratic regression and related results. Fitting of curves reducible to polynomials by log and inverse transformation. Multivariate data: Multiple regression, multiple correlation and partial correlation in 3 variables. Their measures and related results.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Bhat B.R.,Srivankataramana T. and Rao Madhav K.S. (1997): Statistics; A Beachners Vol. II, New Age International (P) Ltd.

2.Croxton FE, Cowden DJ and Klein S: Applied General Statistics (1973): Prentice Hall of India.

3.Goon A.M., Gupta M.K., Dasgupta B. Fundamentals of Statistics, Vol. 1(1991) & Vol. 2(2001). World Press, Calcutta.

5.Gupta V.K. and Kapor S.C. : Fundamentals of Mathematical Statistics S. Chand and Sons.

ADDITIONAl REFERENCES:

6.Cook, Cramer and Clark (): Basic Statistical Computing, Chapman and Hall.

7. Mood A.M., Grabill F.A. and Bose D.C.(1974): Introduction to the theory of Statistics, McGraw Hill.

8.Snedecor GW and Cochran WG: Statistical Methods (1967) : Lowa State University Press.

9.Spiegel, MR (1967): Theory & Problems of Statistics (1967): Schaum's Publishing Series.

Paper III

Practical: Practical Based on Paper I & II

1. Presentation of data by Frequency tables, diagrams and graphs.
2. Calculation of Measures of Central Tendency, dispersion , skewness and kurtosis
3. Product Moment Correlation and Correlation Ratio
4. Fitting of Curves by the least square method
5. Regression of two variables
6. Spearman's Rank correlation Coefficient
7. Multiple regression of three variables
8. Multiple correlation and partial correlation
9. Evaluation of probabilities using addition and multiplication theorems, conditional probabilities and Bayes theorems
10. Exercises on mathematical expectations and finding measures of central tendency, dispersion, skewness and kurtosis of univariate probability distributions
11. Fitting of univariate and conditional distributions

DEFENCE - STUDIES

PAPER - I

INDIAN MILITATY HISRORY M.M. 50

(paper code - 0817)

AIM : The main idea behind this paper is to give a conceptual background about the events and factors which infleenced course of history and helped in developing the art of war in India.

Note : Questions will be set from each unit, There will be only internal choice.

UNIT-1 1. The definition and scope of Defence Studies and its relationship with other subjects.

2. Art of war of Epic and Puranic period.
3. Comparative study of lndo-Greek art of war with special reference to the Battle of Hydaspus 326 B.C.
4. Mauryan Military system and art of war.

UNIT-2 1. Kautalya's Philosophy of war.

2. Gupta's military system and art of war.
3. Military system of Harshavardhan.
4. Dicline of Chariots and Importance of Elephant and Cavalory.

UNIT-3 1. Mughal military system.

2. Rajput and Turk pattern of warfare with speci of reference to Battle of Somnath and Battle of Tarain up to 12th century A.D.
3. Causes of the fall pf Rajput Military system.
4. Army organization during Sultanate period.
5. Battle of Panipat 1526 A.D. and Battle of Haldighati 1576 A.D.

UNIT-4 1. Maratha Military system.

2. Warfare of Shivaji.
3. Battle of Assaye 1803 A.D.
4. Sikh Military system.
5. Battle of Sobraon 1846 A.D

UNIT-5 1 . 1857 Liberation Movement.

2. Reorganizations of Indian Army under the, Crown.
3. Nationalization of, Indian Army after independence.
4. Military reforms of Lord Kitchner's.

READING LIST :

1. Military System of Anciant India : B.K. Majumdar
2. Generalship of Alexander the Great : J.F.C.Fuller
3. Kautilya Arthashastra : K.P. Kanbley
4. Military history of India : J.N. Sarkar

PAPER - II

DEFENCE MECHANISM OF THE MODERN STATE

(paper code - 0818)

AIM : To enable students to appreciate the importance of higher political direction in the formulation of national defence policy and roles as political and military leadership in furthering national security.

Note : Question will be from each unit, there will be only internal choice.

UNIT-1 1. Evolution of National defence policy.

2. Inter dependence of Foreign, Defence and Economics policies.
3. Higher defence organization of U.S.A., U.K. and RUSSIA.
4. Higher defence organization of CHINA, PAKISTAN and NATO.

UNIT-2 1. Higher defence organization in India.

2. Powers of President and relation to Armed forces.
3. Parliament and the Armed forces.
4. Defence (Political affair) committee of the cabinet. Its composition, methods of working during war and peace.
5. National Defence Council and its Valiant.

UNIT-3 1. Organization of Ministry of Defence.

2. Organization of Army head quarter.
3. Organization of Naval head quarter.
4. Orgatiization of Air head quarter.

UNIT-4 1. Organization and role of Para-militaty forces - B.S.F., I.T.B.P., C.I.S.F. etc.

2. Organization and role of Intelligence Agencies - RAW, CBI, CID., IB etc.
3. Military Intelligence.
4. Role of N.C.C. in preparing youth for Defence services.

UNIT-5 1. Organization of Civil - defence.

2. Importance and role of civil defence during war and peace.
3. Air-Raid signal and precaution before and after bombardment.
3. Role of Indian armed forces in war and peace.

READING LIST :

1. Indian Army, A Sketch of its History & Organisation : E.H.E. Choen
2. Defence Organization in India : Venkateshwarm

PRACTICAL **M.M. : 50**

There shall be practicall examination ot 3 hours duration and carying 50 marks. The distribution of marks shall be as follows -

1. Exercises based on Map reading : 20 Marks
2. Exercises based on models : 10 Marks
3. Sessional Work and Record : 10 Marks
4. Viva-Voce : 10 Marks,

PART - A

ELEMENTARY MAP READING

1. Maps- Difination, types, Marginal Information.
2. Conventional signs - Military and Geographical.
3. Direction and cardinal points.
4. Types of North, Angle of Convergence.
5. Study of Liquid compass, its parts, various tactical uses and preparation of Night navigation chart.
6. service Protractor and its uses.
7. To find North by Compass, Watch, Sun, Stars etc.
8. Bearing and interconversion of bearing.
9. Setting of Map.
10. Grid System.

PART - B

RECOGNITION & ELEMENTRY STUDY OF FOLLOWING MODELS

1. equivalent Rank and Badges of Indian Army, Navy and Air Force.
2. Famous Armoured vehicles used in war.
3. Weapons used in Infantry.
4. Various Ships of Indian Navy.
5. Famous Air-Crafts Used by Air-Force.

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INDUSTRIAL CHEMISTRY

PAPER - I

INDUSTRIAL ASPECTS, OF ORGANIC & INORGANIC CHEMISTRY

(paper code - 0821)

UNIT-1 1.1 Nomenclature Generic names, Rade names.

1.2 Raw Materials for Organic compounds :-

Petroleum, natural gas, Fractionation of Crude oil.

UNIT-2 2.1. Petrolutri :- Cracking, reforming Hydroforming isomerisaton.

2.2. Coal :- Types, Structure,' Properties, distillation of coal', chemicals derived there from.

UNIT-33.1.Renewable natural resources :- Cellulose, starch, properties, modification, impor-tant ind. Chemicals derived from them, Alcohol and alcohol based chemicals, Ox-alic acid, Furfural.

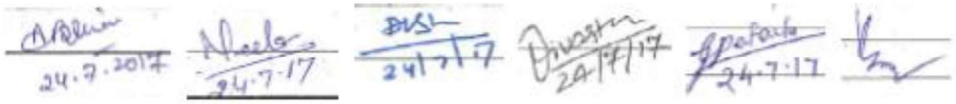
3.2. Basic metallurgical operations':- PuIverisation, calcination, Roasting, refining.

UNIT-4 4.1 Physico chemical principles of extraction of,:- Iron, Copper, Lead, Silver, Sodium, Aluminium, Magnesium, Zinc, Chromium.

UNIT-5 Inorganic materials of Industrial Importance :- Their availablility, forms, structure arid modification. Alumina, Silica, Silicates, Clays, Mica, Carbon, Zeolites.

BOOKS :

1. Coal Conversion, E.J. Hoggman, The Energon Co., Lavamic Wyomnig, U.S.A.
2. Introduction of Petroleum Chemicals, H. Steiner, Pergamen Press.
3. From Agrocarbon to Petrochemicals, L.F. Hatch & S. Matarm, Gulf Publishing Co., Houston.
4. Colten Cellutose : Its Chemistry & Technology, Hall A.G.
5. Methods in Carbohydrate Chemistry, Vol. 3 - Cellulose, Whistler, R.L.
6. Chemistry of Cellulose, Heuser, E.
7. Chemistry & Industry of Starch, Kerr, R.W.
8. Modified Starches : Properties & Uses, Wurzburg, O.B.
9. Principles of Extractive Metallurgy, Herbashi, Vol. I & II.
10. Theory of Metellurgical Processes, Volsky, A. & Sergievskaya, F.
11. Text book of Metallurg, Baiky, A.R.
12. Clays, H. Reis, John Wileys & Sons.
13. Unit Processes of Extractive Metallurgy, Pehike, Elserier Publication.
14. Industrial Chemistry, Reigel, Reinhold Publication.



PAPER - II

INDUSTRIAL ASPECTS OF PHYSICAL CHEMISTRY

MATERIAL AND ENERGY BALANCE

(paper code - 0822)

UNIT-1 Surface. chemistry and Interfacial Phenomena Adsorption lsotherm, Sols, Gels, Emulions, Micoemulsions,.micelles, Aerosols, Effect of surfacttants, Hydrotropes.

UNIT-2 Calalysts :- Introduction, Types, Homog-eneous and Heterogeneous, Basic Principles, Mechanisms factors affecting the performance, Introduction to phase transfer catalysis

UNIT-3 3.1. Enzyme catalysed reactions - Rate model, Industrially important reactions.

3.2. Material Balance without chemical Reactions:- flow diagram formaterial balance, simple material with or without recycle or by-pass for chemical engineering opera-tions such as distillation, crystallisation, evaporation, extraction, etc.

UNIT-4 4.1. Dimensions and Units :- Basic. chemical calculations -Atomic weight, molecular, weight, equivalent weight, mole composition of (i) liquid mixt'ure & (ii) gaseous mixture.

4.2. Material balance involving chemical reaction :- concept of limiting reactant, con-version, yield liquid phase reaction, gas phase reactions with/without recycle or by-pass.

UNIT-5 Energy Balance :- Heat capacity of p-ure gases and gaseous mixtures at constant pres sures. Sensible heat changes. in liquids, Enthalpy changes.

BOOKS :

1. Aersol, Science & Technology, Shephered, H.R.
2. Catalysir :Heterogeneons & Homogeneous, Delmon, Elbevior Scienu Publication.
3. Catalysir, Science & Technology, Anderson, J.
4. Catalysir in Micelller & Macromolecular systems, Fendler & Fendler.
5. Phase Transfer Catalysis, Principle & Techniques, Strles, C.
6. Surgace Chemistry, J.J. Bikermann, Academic Press.
7. Physical Chemistry of Surfaces by A.W. Admson.
8. Storchiometry, B.I. Bhalt & S.M. Vora.
9. Chamical Process Principle - Part I, B.A. Hougen, K.M. Watson & R.A. Ragats, Asia Publi-cation.

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

PAPER - III

UNIT OPERATIONS IN CHEMICAL INDUSTRY AND UTILITIES, FLUID FLOW AND HEAT TRASNPORT IN INDUSTRY

(paper code - 0823)

UNIT-1 1.1. Distillation - Introduction; Batch and continuous distillation, separation of azeo-tropes, plate columns & packed,columns.

1.2. Absorption - Introduction, Equipments- Packed columns, spray columns, bubble columns, palcked bubble columns, mechanically, agitated contractors.

UNIT-2 2.1 Evaporation - Introduction, Equipm ‘ ents - short tube (standard) evaporator, forced circulation evaporators, falling film evaporators, climbing film (Upward flow) evaporatiors, wiped (agitated) film evaporator.

2.2 Filtration - Introduction, filter media and filter aids, Equipments- Plate and frame,filter press, nutch filter, rotatory drum filter, spartkler filter, candle filter, bahgfifter, cen-trifuge.

2.3 Drying - Introdunction, free moisture, bound. moisture,drying curve, Equipments tray dryer, rotatory dryer, flash drater, fluid bed dryer, drum dryer, spray dryer.

UNIT-3 3.1 Utilities in chemical Industry

Fuel - Types of fuels -advantages and disadvantages, combustion of fuels, calortific value. specification for fuel oil.

Boilers - Types of.-boilers and their functioning.

Water - Specifications fof industrial use, various water treatments.

Steam - Generation and use.

Air - Specifications for Industrial use processing of air.

UNIT-4 Fluid Flow : Fans, blowers, compressors, vacuum pumps, ejector. Pumps :-

Reciprocating pumps,, Gear pumps,. centrifugal pumps.

UNIT-5 Heat Exchangers -: Shall and Tube type; finned tube heat exchangers, plate heat ex-changers, refrigeration cycles.

BOOKS :

1. Introduction Chemical Engineering, W.L. Badger, J.J. Banchero, McGraw Hill.
2. Unit Operations in Chemical Engineering, W.L. McCabe & J.C. Smith, McGraw Hill.
3. Chemical Engineer's Hand Book, J.H. Perry, McGraw Hill.
4. Unit Operations - I & II, D.D. Kale, Pune Vidyarthi Griha Prakashan, Pune.
5. Unit Operations of Chemical Engineering, Vol. I, P. Chattopadhyay, Khanna Publishers, Delhi.

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

PRACTICAL

Duration of Examination :			**04 Hrs.**
Discription of marks	Experiment	:	30 marks
	Viva	:	05 marks
	Sessional	:	05 marks
	Project	:	40 marks
	Total	**:**	**80 marks**

EXPERIMENTS TO BE PERFORMED :

1. Simple laboratory tecniques crystallisation, Fraction Crystallisation, Distillation, Fractional distillation Boiling Point.Diagram.
2. Extraction Processes- Phase diagram, partition$_{HSO}$co-efficient.
3. Preparation of standard solutions- Primary^{2} and^{4}secondary standards, Determination of- and H_3PO_4 in a mixture.
4. Calibration of Thermometres.
5. Acquaintance with safety measures in a laboratory Hazards of Chemicals.
6. Depression and elevation in.b.p./m.p. of solids and liquids.
7. Chromatography-column, Paper, Thin layer.
8. Ore analysis dolomite, limestone, -calcite, Analysis of alloys such as cupro-nickel.
9. Determination of Physical Constants
   Refractive -index, surface tension, Effect of surfactants, on surface tension, viscosity- Fluids, Polymer solutions effect of additives on viscocity, optical rotation.
10. Study, experimenfs/demonstration experiments.

Note : Any two experiments have to be carried out by the students in the Examination. A Mini mum of 60% of the'experiments have to be conducted by the students.

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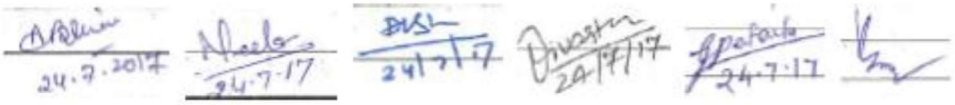

B. SC. PART - I
COMPUTER SCIENCE
PAPER - I
COMPUTER FUNDAMENTALS
PAPER CODE - 0805

MAX MARKS - 50

Note:- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I CLASSIFICATION AND ORGANISATION OF COMPUTERS

History of computer, Generation of computer, calculator vs computer. Digital and Analogue computers and its evolution. Major components of digital computers, Memory addressing capability of CPU. Word length and processing speed of computers, Microprocessors, Single chip Microcomputer, Large and small computers, Users interface, hardware, software and firmware, multiprogramming multiuser system, Dumb smart and intelligent terminals, computers Network and multiprocessing LAN parallel processing, Finn's classification of computers control flow and data flow computers.

UNIT-II CENTRAL PROCESSING UNIT

Parts of CPU-ALU control unit, Registers; Architecture of Intel 8085 microprocessor, Instruction for Intel 8085 microprocessor, Instruction Word size, Various addressing mode, Interrupts some special control signals, Instruction cycle fetch and execute operation, Timing Diagram, Instruction flow and data flow.

UNIT-III MEMORY

Memory hierarchy, Primary and Secondary Memory, Cache memory, Virtual Memory, Direct Access storage devices (DASD) Destructive and Non-destructive Readout, Program and data memory, Memory Management Unit (MMU) PCMCIA cards and Slots.

UNIT-IV I/O DEVICE

I/O devices-Keyboard, Mouse, Monitor, Impact and Non-Impact Printers, Plotters, Scanner, other Input/output devices: Scan method of Display, Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port, Programmable and Non Programmable I/O port, Inbuilt I/O ports, Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer scheme, Microcontroller, Signal Processor, I/O processor, Arithmetic Processor.

UNIT-V SOFTWARE AND PROGRAMMING TECHNIQUES

Application and System Software: Introduction, Example, Difference etc. Introduction to Open Source Software such as Unix/Linux (Ubuntu), Liber office etc. Introduction to Machine Language Assembly Language and High Level Language; Programming Techniques, Stack Subroutine, Debugging of programs, Macro Program Design Software Development, Flow Chart, Multiprogramming, Multiuser, Multitasking Protection, Operating system and Utility programs Application packages

TEXT BOOK

1. Computer Fundamentals, P.K. Sinha, BPB Publication, Sixth Edition.
2. Computer Fundamentals Architecture and Organization, B. Ram, New Age International Publishers, Fifth Edition.
3. Fundamentals of Computers, V. Rajaraman, PHI Sixth Edition.
4. Computers Today, Donald H. Sanders, McGraw-Hill Third Edition.
5. IBM PC and Clones, B. Govindarajulu, McGraw-Hill Second Edition.
6. UNIX Concepts and Applications, Sumitabha Das, Tata McGraw-Hill Fourth Edition.

B. SC. PART - I
COMPUTER SCIENCE
PAPER - II
PROGRAMMING IN C LANGUAGE
PAPER CODE - 0806

MAX MARKS - 50

Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming - Overview of C : History of 'C', Structure of 'C' program. Keywords,Tokens,Datatypes,Constants,LiteralsandVariables,OperatorsandExpressions:Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associativity, Type casting, Console I/O formatting, Unformatted I/O functions: getch(),getchar(), getche(), getc(), putc(), putchar().

UNIT-II

Control Constructs: If-else, conditional operators, switch and break, nested conditional branching statements, loops: For, do.while, while, for, Nested loops, break and continue, goto and label, exit function.

Functions:-Definition, function components: Function arguments, return value, function call statement, function prototype. Type of function Scope and lifetime of variable. Call by value and call by reference. Function using arrays, function with command line argument. User defined function: maths and character functions, Recursive function.

UNIT-III

Array:-Array declaration, one and two dimensional numeric and character arrays. Multidimensional arrays.

String:-String declaration, initialization, and string manipulation with/without using library function.

Structure, Union & Enum- Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, functionreturningstructure.**Union**:basics,declaringunionandunionvariable,**Enum**:declaringenumanden umvariable.

UNIT-IV

Pointers: Definition of pointers, Pointer declaration, Using &and* operators. Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions–malloc, calloc, realloc and free, Pointers vs. Arrays, Arrays of pointer, pointer to array, Pointers to functions ,Function returning pointer, Passing function as Argumenttofunction,Pointertostructure,Dynamicarrayofstructurethroughpointertostructure.

UNIT-V

File Handling and Miscellaneous Features-Filehandling:filepointer,F ileaccessingfunctions,:fopen, fclose,fputc,fgetc,fprintf,fscanf,fread,fwrite,beof,fflush,rewind,fseek,ferror.File handling through command line argument. Introduction to C preprocess or #include, #define, conditional compilation directives:#if,#else,#elif, #endif, #ifndefetc.

TEXTBOOKS

1. Programming in ANCII. Balagurusamy c Tata McGgraw-Hill third edition.
2. Let Us C, Yashwant Kanetkar Infiniti science Press, 8th edition.
3. Mastering C, K.R. Venugopal Tata McGgraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis, M Ritchic, Prentice Hall Second Edition.
5. Application programming in ANSI C, R. Johnsonbaugh, Martins Kalin, Macmillan Second Edition.
6. The Spirit of C Mullish Cooper, Jaico Publishing House.
7. How to solve it by computer, R.G. Dromeypearson edition.

ELECTRONICS EQUIPMENT MAINTENANCE
PAPER - I
PRINCIPLES OF ELECTRONICS
(paper code - 0809)

UNIT-1 General information : Symbol, colour code, types (Such an carbon, mental film, thin-film thick-fillm, wire-wound), Variable resistors potentiometers (logarithmic linear multi-turn wire wound rheostate.

Physical properties : Temperature dependence (Thermistor), Light Dependencs (LDR),

Voltage Dependence (VDR).technical specification wattage and working voltages. Methods of measurement of resistance: very low to very high values.

INDUCTORS : General Information: symbol, Types each as air core, iron core, ferrite core, chocking inductors (Coil), frequency response of an inductor.

Method of measurement of inductances: using universal bridges design and fabrication rules.

CAPACITORS : General infortnation : symbol, colour code, types of capacitors such as

Air, paper, Electrolytic, Mica, Tentalum Polyuterene, fixed and variable capacitors. Mea-surement of Capacitance: universal bridge. application areas.
BATFERIES : Dry Cells, Lead-Acid Accumulators, Nickel Cadrnlum cells, standard cells, principles, Specifications.
FUSES : Fast and Slow Fuses, Pilot Lamps.
PCB : Types of PCB, layout techniques, cables and connectors for PCB

UNIT-2 TRANSFORMERS: General information- principle, types of transformer such as single phase, auto mains and isolation transformers. Frequency dependence of transformer theoriern. (Audio, IF and RF), Design of mains transformers and CVT.

RELAYS : General ihformation: symbol, types of relays, such as rend electromagnefic. Specifications, rating, application areas.

MICROPHONES AND LOUDSPEAKERS : General information: frequency response, input and output Impodance, power rating, directionality (omns and unli-directional). Application areas.
TRANSDUCERS : Commonly used transducers, L.D.R., thermistars thermocouples, phatodioden, pholc transistors, IR detectors L Volt.

UNIT-3 SWITCHES, CABLE AND CONNECTORS : Spdl, dpdl, band switches, touch switches, thumpwheel switches, rnicro switches, specifications, application areas.

NETWORK THEOREMS : Kirchoffs current and voltage law, -maximurr. power transfer,

THEOREMT : bevenins theorem, norton's theorem, super position theorem.

LCR AND WAVESHAPING CIRCLITS : Serial and parallal response, idea of black Nix., qwivalent circuits. Idea of two terminal and two part network, eqi&alent cirewits. Integra-tion, differer lation using R.C. circuits, *chpping clampaig.*

UNIT-4 NUMBER SYSTEMS : Introduction to decimal bmiazy, octal floca decial, number system interconversions of decimals binary and BCD number. Binary arithmetic and Boolean algebr& Boolean axiom, D Morgan's theorms-statement vanfication and applications.

LOGIC GATES : Posifive and Negative logic, different logic gate, such as AND, OR NOT, NAI, NOF, EXOR, symbol and truth tables. Inverting a non-irverting suffers.

LOGIC.FAMILIES : TTL, ECL & CMOS parameters like power dissipation, speed, sup-ply requirements, logic level, fan in, fan out noise half addar, full addar, half subtulor.

UNIT-5 COMBINATIONAL CIRCUITS : Encioder-decoder sequenfial circuits, flip flops (As,K,,D,I,N,S) -shift, registers, counte% Semiconductors memory.

PAPER - II
ELECTRONIC DEVICES, COMPONENTS & ASSEMBLIES
(paper code - 0810)

UNIT-1 INTRODUCTION- TO SEMI CONDUCTORS

ENERGY BAND DIAGRAM: conductors, semiconductor, insulation, intrinsic and exitrinsic sermi conductors (P.N. type), diffused junctions, depletion layer, barrier potential.

JUNCTION DIODES : Rectifying diode, forward and reverse bias characteris tic, switch-ing diode, varacleor diode, photo diode. light ernitting diode, IR sources and delector optical isolators, Zener diode, Tunnel diode, tunnel diode.

BIPOLAR JUNCTION TRANSISTORS : Basic working principle (qualitative), characterstic, Basic configurations and baising. Operating point, load line, biasmig for stabilization of operating point.

UINT-2 JEFT & MOSFET: Basic working principle (qualitative), charactenistic Binchoff voltage,

UNI JUNCTION TRANSISTORS : Basic working principle (qualitative), characterstic applications, as a switch.

POWER CONTROL DEVICES : Four layer diode (PNPN), Sillicon conq-olled, rectifier
(SCR) tracis, diac, principle & characteristics.

AMPLIFIERS : Different terms used in amplifers, sucn as signal fource ssource, input output, voltage and current gain power gain,- decibel , input and'output impendance.

Classification according to the frequency response, RC coupled, class A common emit-ter Amplifier, Introduction to the class & operafion

FEED BACK IN AMPLIFIER : Effect of negative feedback on amplifier performance.

UNIT-3 POWER AMPLIFIER : Transformer coupled equivalent circuit only in brief, class A, class B. class AB and class C the constant power hyperbola, the AC load line input and output considerations, determination of Non-hner distortion.

PUSH-PULL AMPLIFIERS : Phase splitter circuits, complimentary push-pull, thermal ranway, Heat sinks.
Class B and C resonant load amplifiers, graphical class C analysis, **resonant** load requirements.

OPERATIONAL AMPLIFIER :

Basic, idea of an OPAMP with black box concept miverting and noninverting inputs, virtual ground

Parameters such as input impendance, output impendance, open loop gain, measure-ments of parameters.

Qualitative description of OPAMP as mverting and non inverting arnphfier, summing and. difference amplifier, comparater and linear ubtegratirs, instrumentation amplifier.

UNIT-4 OSCILLATORS : Positive feedback, barkhausen criltenia, phase shift oscillators, wei bridge oscillators Tuned oscillators, Hartley, colpits-oscillators, crystal oscillator.

POWER SUPPLIES : Regulated power supply, Zener regulated power supply series and shunt regulated power supply, block diagrain of IC 723, regulated supply of IC 723.

11iree ter~nal Ics power supply. Study of power supply. w.r. to variation ‘in loadand I ‘me voltage.

SWITCHED MODE POWER SUPPLY : Design principle, and application. **IC 555** : Operations and applications.

UNIT-5 MODULATION : AM and FM : Principles, modulation, index, modulation, bandwidth, balanced modulator,

DEMODULATION : Am and Fm delectors diode detectors, ratio detector, balanced de-modulator’.

Introduction to communication systems, basic principles and operation of communica-tion system.

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

Session 2019-20

June 2019 onwards

Class: B.Sc. Electronics

Scheme of Examination

Paper Code	Course Opted	Title of Course	Theory	Practical	Grand Total	Minimum Passing Marks
First Year						
ELB-101	Core Course	Network Analysis And Analog Electronics	**50**		**100**	**33**
ELB-102	Core Course	Linear and Digital Integrated Circuits	**50**			
ELB-103P	Core Course Practical/Tutorial	Networks Analysis and Analog Electronics Lab	**25**	**50**	**50**	**17**
ELB-104P	Core Course Practical/Tutorial	Linear and Digital Integrated Circuits Lab	**25**			
Second Year						
ELB-201	Core Course	Communication Electronics	**50**		**100**	**33**
ELB-202	Core Course	Microprocessor and Microcontrollers	**50**			
ELB-203P	Course Practical/Tutorial	Communication Electronics Lab	**25**	**50**	**50**	**17**
ELB-204P	Course Practical/Tutorial	Microprocessor& Microcontroller Lab	**25**			
Third Year						
EL301	**Skill Enhancement Course**	Industrial Electronics	**50**		**100**	**33**
EL302	**Skill Enhancement Course**	Mobile Application Programming and Introduction to VHDL	**50**			
EL303P	**Skill Enhancement CoursePractical**	Industrial Electronics Lab	**25**	**50**	**50**	**17**
EL304P	**Skill Enhancement Course Practical**	Mobile Application Programming and Introduction to VHDL Lab	**25**			

B . S c . P a r t I

ELECTRONICS

Paper-I

ELB-101: NETWORK ANALYSIS AND ANALOGELECTRONICS

Theory: **Maximum Marks 50**

Unit-1

Basic Circuit Concepts: Voltage and Current Sources, Review of Resistors, Inductors, Capacitors. Circuit Analysis: Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL),

AC Circuit Analysis: Sinusoidal Voltage and Current, Definition of Instantaneous, Peak,Peak to Peak, Root Mean Square and Average Values. AC applied to Series RC and RL circuits: Impedance of series RC & RL circuits.AC applied to Series and parallel RLC circuit, Series and Parallel Resonance, condition for Resonance, Resonant Frequency, Bandwidth, and significance of Quality Factor (Q).

Passive Filters: Low Pass, High Pass.

Network Theorems: Principal of Duality, Superposition Theorem, Thevenin's Theorem,Norton's Theorem, Reciprocity Theorem, Millman's Theorem, Maximum Power Transfer Theorem. AC circuit analysis using Network theorems.

Unit-2

Junction Diode and its applications: PN junction diode (Ideal and practical)-constructions, Formation of Depletion Layer, Diode Equation and I-V characteristics. Idea of static and dynamic resistance, dc load line analysis, Quiescent (Q) point. Zener diode, Reverse saturation current, Zener and avalanche breakdown. Rectifiers- Half wave rectifier, Full wave rectifiers (center tapped and bridge), circuit diagrams, working and waveforms, ripple factor and efficiency. Filter-Shunt capacitor filter, its role in power supply, output waveform, and working. Regulation- Line and load regulation, Zener diode as voltage regulator, and explanationfor load and line regulation.

Unit-3

Bipolar Junction Transistor: CE, CB Characteristics and regions of operation, Transistor biasing, DC load line, operating point, thermal runaway, idea about stability and stability factor. Voltage divider bias, circuit diagrams and their working.

Field Effect Transistors: JFET, Construction, Working and Characteristics. MOSFET, Construction, Working and Characteristics.

Power Devices: UJT, Construction, Working and Characteristics. SCR, Diac, Triac, Construction, Working and Characteristics and Applications.

Unit-4

Amplifiers: Transistor biasing and Stabilization circuits- Fixed Bias and VoltageDivider Bias. Thermal runaway, stability and stability factor S. Transistor as a two port network, h-parameter equivalent circuit. Small signal analysis of single stage CE amplifier. Input and Output impedance, Current and Voltage gains. Class A, B and CAmplifiers.

Cascaded Amplifiers: Two stage RC Coupled Amplifier and its Frequency Response.

Unit-5

Feedback in Amplifiers: Concept of feedback, negative and positive feedback, advantages of negative feedback (Qualitative only).

Sinusoidal Oscillators: Barkhausen criterion for sustained oscillations. Phase shift,Weins bridge, Crystal andColpitt's oscillator. Determination of Frequency and Condition of oscillation.

Reference Books:

[1] Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004)

[2] Electrical Circuits, M. Nahvi& J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)

[3] Electrical Circuits, K.A. Smith and R.E. Alley, 2014, Cambridge University Press

[4] Network, Lines and Fields, J.D.Ryder, Prentice Hall of India.

[5] Electronic Devices and Circuits, David A. Bell, 5th Edition 2015, Oxford University Press.

[6] Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove, Tata McGraw Hill

[7] Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning

[8] Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6thEdn., Oxford University Press.

[9] J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)

[10] J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)

Paper- II

ELB-102: LINEAR AND DIGITAL INTEGRATEDCIRCUITS

Theory: **Maximum Marks 50**

Unit-1

Operational Amplifiers (Black box approach): Characteristics of an Ideal and Practical Operational Amplifier (IC 741), Open and closed loop configuration, Frequency Response. CMRR. Slew Rate and concept of Virtual Ground.

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Summing and Difference Amplifier, (3) Differentiator, (4) Integrator, (5) Wein bridge oscillator, (6) Comparator and Zero-crossing detector, and (7) Active low pass and high pass, Butterworth filter (1^{st} order only).

Unit-2

Number System and Codes: Decimal, Binary, Octal and Hexadecimal number systems base conversions. Representation of signed and unsigned numbers, BCD code. Binary, octal and hexadecimal arithmetic; addition, subtraction by 2's complement method, multiplication.

Logic Gates and Boolean algebra: Truth Tables of OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Basic postulates and fundamental theorems of Boolean algebra.

Unit-3

Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh map minimization up to 4 variables for SOP).Arithmetic Circuits: Binary Addition. Half and Full Adder.Half and Full Subtractor, 4-bit binary Adder/Subtractor.

Data processing circuits: Multiplexers, De-multiplexers, Decoders, Encoders. Clock and Timer (IC 555): Introduction, Block diagram of IC 555, Astable and Monostable multivibrator circuits.

Unit-4

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. Master-slave JK Flip-Flop.

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

Counters (4 bits): Ring Counter. Asynchronous counters, Decade Counter Synchronous Counter.

Unit-5

D-A and A-D Conversion: 4 bit binary weighted and R-2R D-A converters, circuit and working, Accuracy and Resolution. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

Reference Books:

[1] OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall

[2] Operational Amplifiers and Linear ICs, David A. Bell, 3rd Edition, 2011, Oxford University Press.

[3] Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw

[4] Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.

[5] Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.

[6] Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning.

[7] Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)

[8] R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)

ELECTRONICS LABORATORY

ELB 103P: NETWORK ANALYSIS AND ANALOG ELECTRONICS LAB

(Hardware and Circuit Simulation Software) **Max.Marks:25**

The scheme of practical examination will be as follows-

Experiment	**--**	**30**
Viva	**--**	**10**
Sessional	**--**	**10**
Total	**--**	**50**

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
5. Verification of the Maximum Power Transfer Theorem.
6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt`s oscillator.

Reference Books:

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

ELECTRONICS LAB

ELB 104P: LINEAR AND DIGITAL INTEGRATED CIRCUITS LAB

Max.Marks:25

At least 04 experiments each from section A, B and C

Section-A: Op-Amp. Circuits (Hardware)

1. To design an inverting amplifier using Op-amp (741,351)for dc voltage of given gain
2. (a) To design inverting amplifier using Op-amp (741,351) & study its frequency response
   (b) To design non-inverting amplifier using Op-amp (741,351) & study frequency response
3. (a) To add two dc voltages using Op-amp in inverting and non-inverting mode
   (b) To study the zero-crossing detector and comparator.
4. To design a precision Differential amplifier of given I/O specification using Op-amp.
5. To investigate the use of an op-amp as an Integrator.
6. To investigate the use of an op-amp as a Differentiator.
7. To design a Wien bridge oscillator for given frequency using an op-amp.
8. To design a circuit to simulate the solution of simultaneous equation and $1^{st}/2^{nd}$order differential equation.
9. Design a Butterworth Low Pass active Filter (1^{st} order) & study Frequency Response
10. Design a Butterworth High Pass active Filter (1^{st} order) & study Frequency Response
11. Design a digital to analog converter (DAC) of given specifications.

Section-B: Digital circuits (Hardware)

1. (a) To design a combinational logic system for a specified Truth Table.
   (b) To convert Boolean expression into logic circuit & design it using logic gate ICs.
   (c) To minimize a given logic circuit.
2. Half Adder and Full Adder.
3. Half Subtractor and Full Subtractor.
4. 4 bit binary adder and adder-subtractor using Full adder IC.
5. To design a seven segment decoder.
6. To design an AstableMultivibrator of given specification using IC 555 Timer.
7. To design a MonostableMultivibrator of given specification using IC 555 Timer.
8. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
9. To build JK Master-slave flip-flop using Flip-Flop ICs
10. To build a Counter using D-type/JK Flip-Flop ICs and study timing diagram.
11. To make a Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs.

Section-C: SPICE/MULTISIM simulations for electronic circuits and devices

1. To verify the Thevenin and Norton Theorems.
2. Design and analyze the series and parallel LCR circuits
3. Design the inverting and non-inverting amplifier using an Op-Amp of given gain
4. Design and Verification of op-amp as integrator and differentiator
5. Design the 1storder active low pass and high pass filters of given cutoff frequency
6. Design a Wein`s Bridge oscillator of given frequency.
7. Design clocked SR and JK Flip-Flop`s using NAND Gates
8. Design 4-bit asynchronous counter using Flip-Flop ICs
9. Design the CE amplifier of a given gain and its frequency response.

Reference Books

1. Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw
2. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4thedn., 2000, Prentice Hall
3. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
4. Digital Electronics, S.K. Mandal, 2010, 1st edition, McGraw Hill

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B.Sc. Part-I
INFORMATION TECHNOLOGY
PAPER-I
FUNDAMENTAL OF IT, COMPUTER AND PC SOFTWARE
(PAPER CODE-0824)

NOTE : The Question paper setter is advised to prepare unit wise question with the provision of internal choice

MAX MARKS : 50

UNIT-I INFORMATION TECHNOLOGY

Concept of IT and information system, Application of IT (In Business, Education Medicine Science Governance and Agriculture) Impact of IT on society E and industry, Legal and Ethical aspect of IT, Security and Threats in IT, M-Commerce, Virtual reality, latest trend in IT, future of IT.

UNIT-II COMPUTER NETWORK

BASIC CONCEPT OF COMPUTER NETWORK Internet concept **LAN, MAN, WAN** Topology, Protocol, Transmission mode Communication Process Required element of data communication.

WIRELESS COMMUNICATION Mobile Internet GPS,3G, 4G Wi-Fi Bluetooth infrared radio frequency microwave.

SOCIAL NETWORK Evolutions of social network site (YouTube, Facebook, LinkedIn Twitter) Advantages and Disadvantage of social networking sites.

UNIT-III MS WORD

Introduction word processing (MS-Word) Advantage of word processing, Introduction and Installation Editing a file using paragraph styles, Newspaper style columns using macros advanced word processing, Headers and Footers, Finding text setting up printer Mail merge and other applications, mathematical calculator, table handling.

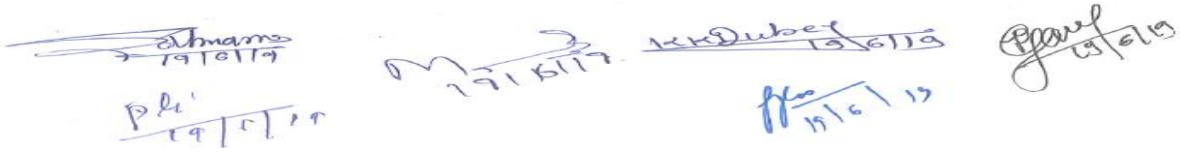
UNIT-IV MS-EXCEL

Introduction to spreadsheets (MS-EXCEL), Definition and advantage of electronics worksheet, Working on spread sheets range and related operations, Setting saving and retrieving worksheets Inserting, Deleting, Copying and Moving of data cells, Inserting and deleting rows and column, protecting Cells Printing a worksheet, erasing a worksheet in Graphs creations, Type of graphs, Creating a chart sheet 3D, Columns charts, Moving and changing the size of chart, Printing the chart.

UNIT-V MS POWERPOINT AND MS ACCESS

MS-POWERPOINT: Presenting with Power point: Creating presentation working with slides, Different type of slides, Settings page layout, Selecting background and applying designs, Adding graphics to slide, Adding sound and movie, Creating chart and graph, Playing a slide show, slide transition, Advancing slide, Setting time, Rehashing timing, Animating slide, Animating objects, Running the show from window.

MS ACCESS: Creating table in access define data type Manipulating records.



TEXTBOOKS

1. Computer fundamental R.K.Sinha BPB Publication Sixth edition.
2. Introduction to Information Technology V Raja Raman PHI Second Edition.
3. Computer Networks Forouzan Tata McGraw Hill Second Edition.
4. Microsoft Office 2007 fundamentals L Story D walls.
5. MS Office, S.S.Srivastava Firewall media.

B. SC. PART - I
INFORMATION TECHNOLOGY
PAPER - II
PRAMMING IN C LANGUAGE

MAX MARKS - 50

Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT-I

Fundamentals of C Programming - Overview of C: History of 'C', Structure of 'C' program. Keywords, Tokens, Datatypes, Constants, Literals and Variables, Operators and Expressions : Arithmetic operators, Relational operator, Logical operators, Expressions, Operator: operator precedence and associativity,Typecasting,ConsoleI/Oformatting,UnformattedI/Ofunctions:getch(),getchar,getche(), getc(),putc(),putchar().

UNIT-II

Control Constructs : If-else, conditional operators, switch and break, nested conditional branching statements, loops: do...While, while, for, Nested loops, break and continue, goto and label, exit function.
Functions:-definition, function components: Function arguments, return value, function call statement, function prototype. Type of function Scope and lifetime of variable. Call by value and call by reference. Function using arrays, function with command line argument. User defined function: Maths and character functions, Recursive function.

UNIT-III

Arrays, Strings and Functions: Array:-Array declaration, One and Two dimensional numeric and character arrays. Multidimensional arrays.
String:-String declaration, initialization and string manipulation with/without using library function.
Structure, Union &Enum- Structure: basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union**: basics, declaring union and union variable. **Enum** : declaring enum and enum variable.

UNIT-IV

Pointers: Definition of pointers, pointer declaration, using &and* operators. Void pointer, pointer to pointer, Pointer in math expression, Pointer arithmetic, pointer comparison, dynamic memory allocation functions–malloc, calloc, realloc and free, pointers vs Array, Arrays of pointer, Pointer to array, Pointers to function, function returning pointer, passing function as argument to function, Pointer to structure, Dynamic array of structure through pointer to structure.

UNIT-V

File Handling and Miscellaneous Features- File handling: file pointer, file accessing functions,: fopen, fclose,fputc,fgetc,fprintf,fscanf,fread,fwrite,beof,fflush,rewind,fseek,ferror.File handling through command line argument. Introduction to C preprocessor #include, #define, Conditional compilation directives:#if,#else,#elif,#endif,#ifndefetc.

TEXTBOOKS

1. Programming in ANCI E. Balagurusamy c Tata McGraw-Hill third edition.
2. Let Us C, Yashwant Kanetkar Infiniti science Press, Eighth edition.
3. Mastering C, K.R. Venugopal Tata McGraw-Hill.
4. The C Programming Language, Brian W. Kernighan, Dennis, M Ritchic, Prentice Hall Second Edition.
5. Application programming in ANSI C, R. Johnsonbaugh, Martins Kalin, Macmillan Second Edition.
6. The Spirite of C Mullish Cooper, Jaico Publishing House.
7. How to solve it by computer, R.G. Dromey person edition.

INDUSTRIAL MICROBIOLOGY

Paper	Title	Time	Marks
First	General Microbiology, Tools and Techniques	3 hrs.	50
Second	Molecular Biology, Biochemistry and Microbial Genetics	3 hrs.	50
	PRACTICAL (including sessionals)	4 hrs.	50 (40+10)

PAPER -

GENERAL MICROBIOLOGY, TOOLS AND TECHNIQUES M.M.50

I (paper code - 0826)

UNIT-1 History and development of Industrial Microbiology. Contributions of antony von Leeuwenhoek, Louis Pasteur, Robert Koch, Edward Jenner, Wakman, Alexandar Flaming.

UNIT-2 General characteristics and structure of Bacteria, Cyanobacteria, Fungi, Actino-mycetes, Mycoplasms, Vinuses.

UNIT-3 Microscopy - Invention of Microscope, Compound microscope, Dark field, Fluorescent, Phase contrast and Electron microscope.

UNIT-4 Method of sterilization, culture media and isolation techniques. Methods of preservation of microbial cultures.

UNIT-5 Basic principles and usage - pH meter, Densitometer, Colorimeter, Spectrophotometry, Fluori-metry, Centrifugation - Principles and applications. Usage of Fermentation.

PRACTICALS

The Practical works will, in general be based on the prescribed syllabhus in theory and the candidates will be required to show the knowledge of the following :

1. Preparation of media, autoclaving and sterilization of glassware.
2. Isolation of Phytopathogens.
3. Isolation of Microorganisms from soil and water : Bacteria, Fungi, and Algae.
4. Purification of microbial cultures.
5. Camera Lucida Drawing.
6. Standard Plate count.
7. Heamocytometer.
8. Chromatographic techniques : Separation of amino acids by paper and thin layer chromatography.
9. Measurement of pH of fruit juice.
10. Estimation of cargohydrate by colorimeter.

BOOK RECOMMENDED :

1. General Microbiology, Vol. II by Power and Daginawala.
2. Microbiology by Pelczar, Reid and chan.
3. General Microgiology by Davis and Harper.
4. A Treatise on Media and Methods Used in Bacteriological Techniques by V. Iswarn.
5. Introductory Mycology by C.J. Alexopoulous & Mims.
6. Microbiology by P.D. Sharma.

29/7/17 29/7/17

PAPER - II
MOLECULAR BIOLOGY, BIOCHEMISTRY AND MICROBIAL GENETICS
(paper code - 0827)

M.M. 50

UNIT-1 Nucleic Acids - Structure of DNA and RNA(s), Replication of DNA, Synthesis of RNAs and their types, Genetic code, Concept of genes.

UNIT-2 Molecular Biology - Translation and Protein Synthesis, Operon Concept, CAMP CAP (Catabolic activator protein), Gene expression in Prokaryotes, Lac-Operon. Gene ragulation in Eukaryotes (Britton-Davison Model of Gene Expression).

UNIT-3 Genetic recombination in Bacteria - Transformation, Transduction and conjugation, Genetic Mapping, Extrachromosomal genetic material, Plasmids, Cosmids, Transposons, Overlapping genes, Silent genes and their evolutionary significance. Mutation -Molecular mechanism of mutation, Chemical and Physical Mutagens, Repair of Mutation Damage.

UNIT-4 Biochemistry - Classification of carbohydrates, Chemical structure and property of starch, Cellulose, Glycogen, Synthesis of Purines & Pyrimidine.
Lipids - Saturated and unsaturated fatty acids, Biosynthesis of fatty acids, Distribution and functions of lipids in microorganisms, Degradation of lipids by O < B and Co oxidation, Lipid peroxidation.

UNIT-5 Enzymes - Classification. Co-enzymes, Cofactors, Mechanism of enzyme action, Competitive and non-competitive inhibition. Allosteric regulations of enzymes, isoenzymes, factors contributing to catalytic efficiency of enzymes.

Amino acids - Classification of essential amino acids based on polarity. Acid-base properties and solubilities. Amino acid sequencing of proteins; Primary, Secondary and Tertiary structure.

PRACTICAL

The Practical work will, in general, be based on the syllabus prescribed in theory and the candidates will be required to show the knowledge of the following -

1. Isolation of antibiotic resistant bacteria.
2. Extimation of alkaline phosphatase activity.
3. Measurement of o<amylase activity in extra-cellular fraction of microbial cultures.
4. Estimation of glycogen in bacterial cells.
5. Measurement of cellulase activity by Viscometric technique.
6. Determination of cellulase and amylase activity by reducing sugar assay test.
7. Isolation of DNA.

29/7/17 29/7/17

BOOK RECOMMENDED :

1. General Microbiology, Vol. 1 by Power & Daginawala.
2. Bicrobial Biochemistry by Moat.
3. Principles of Biochemistry by Lehninger.
4. Outline of Biochemistry by Cohn and Stumph.
5. Biochemistry by Harper.
6. Text book of Biochemistry by Rama Rao.
7. Text book of Biochemistry by O.P. Agrawal.

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BIO CHEMISTRY

PAPER-I

BIOMOLECULES **M.M. 50**

(paper code - 0832)

UNIT-I

Introduction to Biochemistry, water as a biological solvent, weak acids and bases, pH, buffers, Henderson-Hasselbalch equation, physiological buffers, fitness of the aqueous environment for living organisms.

CARBOHYDRATES

Structure of monosaccharides. Stereoisomerism and optical isomerism of sugars.

Reactions of aldehyde and ketone groups. Ring structure and anomeric forms, mutarotation. Reactions of sugar due to hydroxyl groups. Important derivatives of monosaccharides, disaccharides and trisaccharides (structure, occurrence and functions of important ones). Structure ocurrence and biological importance of monosaccharides, oligosaccharides and polysaccharides e.g. Cellulose, Chitin, agar, algenic acids, pectins, proteoglycans, sialic acids, blood group polysaccharides, glycogen and starch. Bacterial cell wall polysaccharides etc. Glycoproteins.

UNIT-II Lipids

Definition and classification. Fatty acids : introduction, classification, nomenclature, structure and properties of saturated and unsaturated fatty acids. Essential fatty acids, prostaglandins. Triacylglycerols: nomenclature, physical properties. chemical properities and characterzation of fats - hydrolysis, saponification value, rancidity of fats,

Reichert-Meissel number and reaction of glycerol. Biological significance of fats. Glycerophospholipids (lecithins, lysolecithins, cephalins, phosphatidyl serine, phos-phatidyl inositol, plasmalogens), sphingomyelins, glycolipids - cerebrosides, ganglio-sides. Properties and functions of phospholipids, isoprenoids and sterols.

UNIT-III Proteins

Introduction, classification based on solubility, shape, composition and functions.

Aminoacids: common structural features, stereo-isomerism and RS system of designating optical isomers, classification and chemical properties, titration of amino acids, separation of amino acids. Essential amino acids.

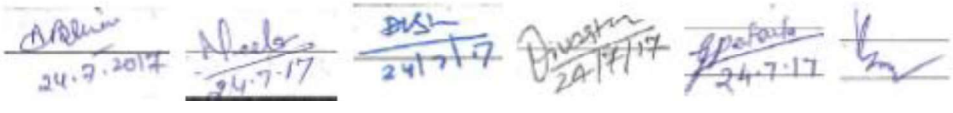
Peptides: structure of peptide bond, chemical synthesis of polypeptides - protection and deprotection of N-terminal, and C-terminal ends and functional groups in the side-chains, formation of peptide bonds, condensing agents, strategy of chemical synthesis, Merrifield solid-phase peptids sysnthesis. Determination of the amino acid sequence of a polypeptide chain, specific chemical and enzymatic cleavage of a polypeptide chains and separation of peptides. Protein structure: levels of structure in protein architecture, primary structure of proteins, secondary structure of proteins helix and pleated sheets, tertiary structure of proteins, forces stabilizing the tertiary structure and quaternary structure of proteins. Denaturation and renaturation of proteins. Behaviour of proteins in solutions, salting in and salting out of proteins.

Structure and biological functions of fibrous proteins (keratins, collagen and elastin), glooular proteins (hemoglobin, myoglobin), lipoproteins, metalloproteins, glycoproteins and nucleoproteins.

UNIT-IV Nature of genetic material: evidence that DNA is the genetic material, Composition of RNA and DNA, generalized structural plan of nucleic acids, nomenclature used in writing structure of nucleic acids, features of DNA double helix. Denaturation and annealing of DNA, structure and roles of different types of RNA Size of DNA in procaryotic and eucaryotic cells, central dogma of molecular biology, Gene, Genome, chromosome.

UNIT-V Porphyrins

Prophyrins: Porphyrin nucleus and classification of porphyrins. important Metalloporphyrins occurring in nature. Detection of porphyrins spectrophotometrically and by fluores-cence. Bile pigments - chemical nature and their physiological significance.



PAPER - II

(paper code - 0833)

BIOPHYSICAL AND BIOCHEMICAL TECHNIQUES M.M. 50

UNIT-I Concepts of Bioenergetics

Principles of thermodynamics and their applications in biochemistry - introduction, thermodynamic system, thermodynamic state functions, first and second laws of thermodynamics, concept of free energy, standard free energy, determination of G for a reaction, relation between equilibrium constant and standard free energy change, biological standard state and standard free energy change in coupled reactions.

Biological oxidation-reduction reactions - introduction, redox potentials, relation between standard reduction potentials and free enegy change (dervations and numericals included). High-energy phosphate compounds - introduction, phosphate^{32} P, ^{35} S, 14 C and 3H group transfers-free energy of hydrolysis of ATP and sugar phosphates along with reasons for high G.

UNIT-II Hydrodynamic Methods

Sedimentation - sedimentation velocity, preparative and analytical ultracentrifugation techniques. determination of molecular weight by hydrodynamic methods (derivations excluded and numericals included).

Measurement of pH

Principles of glass and reference electrodes, types of electrodes, complications of pH measurement (dependence of pH on ionic strength, electrode contamination and sodium error) and use of pH paper.

UNIT-III Radioisotopic Techniques

Types of radioisotopes used in Biochemistry, units of radioactivity measurements, techniques used to measure radioactivity (gas ionization and liquid scintillation counting), nuclear emulsions used in biological studies (pre-mounted, liquid and stripping), isotopes commonly used in biochemical studies-Autoradiography. Biological hazards of radiation and safety measures in handling radioisotopes. Biological application.

UNIT-IV Chromatography

General principles and applications of :

1. Adsorption chromatography
2. Ion-exchange chromatography
3. Thin-layer chromatography
4. Molecular-sieve chromatography
5. Hydrophobic chromatography
6. Gas-liquid chromatography
7. HPLC
8. Affinity chromatography
9. Paper chromatography

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

Electrophoresis

Basic principles of agarose electrophoresis, PAGE and SDS-PAGE, Two-dimensional electrophoresis, its importance. Isoelectrofocussing.

UNIT-V Spectroscopic Techniques

Beer-Lambert law, light absorption and its transmittance, determination and application of extinction coefficient, application of visible and UV spectroscopic techniques (structure elucidation and numericals excluded). Principle and application of NMR, ESR, Mass spectroscopy. Fluorescent and emission spectroscopy.

Immunological Techniques

Immunodiffusion, immunoelectrophoresis, radioimmunoassay, ELISA, immunofluores-cence.

PRACTICAL M.M. 50

1. Preparation of standard buffers and determination of pH of a solution.
2. Qualitative tests for :
   a. Carbohydrates
   b. Proteins and amino acids
   c. Lipids
3. Determination of saponification value and iodine number of fats.
4. Extimation of ascorbic acid.
5. Titration curve for amino acids and determination of pK value;
6. Verification of Beer-Lambert's law.
7. Estimation of
   i) Carbohydrate by anthrone method.
   i) Blood glucose by the methods (a) Folin-Wu, (b) Nelson-Somogyi
8. Estimation of amino acids by ninhydrin method.
9. Isolation and assay of glycogen from rat liver.
10. i) Extraction of total lipids by Folch method
    i) Estimations of food adulterant.
11. Estimation of DNA and RNA.
12. Separation of sugars using paper chromatography.

24.7.2017 24.7.17 24.7.17 24/7/17 24.7.17

Syllabus of Biotechnology

(B. Sc. I Year)

Session

2019-2020
2020-2021

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

B.Sc.-I

BIOTECHNOLOGY

PAPER – I

BIOCHEMISTRY, BIOSTASTICS AND COMPUTERS

UNIT-I

1. Introduction to Biochemistry: History, Scope and Development.
2. Carbohydrates: Classification, Structure and Function of Mono, Oligo and Polysaccharides.
3. Lipids: Structure, Classification and Function.

UNIT –II

1. Amino acids and Proteins: Classification, Structure and Properties of amino acids, Types of Proteins and their Classification and Function.
2. Enzymes: Nomenclature and Classification of enzyme, Mechanism of enzyme action, Enzyme Kinetics and Factors affecting the enzymes action. Immobilization of enzyme and their application.

UNIT –III

1. Hormones: Plant Hormone-Auxin and Gibberellins and Animal Hormone-Pancreas and Thyroid.
2. Carbohydrates, Proteins and Lipid Metabolism - Glycolysis, Glycogenesis, Glyconeogenesis, Glycogenolysis and Krebs cycle. Electron Transport Chain and β-oxidation of Fatty acids.

UNIT-IV

1. Scope of Biostatistics, Samples and Population concept, Collection of data-sampling techniques, Processing and Presentation of data.
2. Measures of Central Tendency: Mean, Median and Mode and Standard Deviation.
3. Probability Calculation: Definition of probability, Theorem on total and compound probability.

UNIT-V

1. Computers - General introduction, Organization of computer, Digital and Analogue Computers and Computer Algorithm.
2. Concept of Hardware and Software, Input and Output Devices.
3. Application of computer in co-ordination of solute concentration, pH and Temperature etc., of a Fermenter in operation and Internet application.

10.6.19 10.6.19 10/6/19 10.6.19

List of Books

1. Nelson and Cox (2005) Principles of Biochemistry, Fourth Edition
2. Todd and Howards Mason (2004) Text book of Biochemistry, Fourth Edition
3. Lubert Stryer and Berg ((2004) Biochemistry, Fifth Edition
4. Diana Rain, Marni Ayers Barby - (2006) Textbook on Q level Programming. 4th Edition.
5. Karl Schwartz: (2006) Guide of Micro Soft. Marina Raod, 4th Edition.
6. E Balaguruswamy by Programming in BASIC (1991).
7. RC Campbell by Statistics for Biologists. .
8. P Cassel et al by Inside Microsoft Office,
9. Statistical Methods, GW Snedecor and WG Cochran.
10. AC Wardlaw by Practical Statistics for Experimental Biologists,
11. JHZar by Bio-statistical analysis
12. RR Sokal FJ Rohlf by Introduction to Biostatistics
13. L Y Kun (2003) Microbial Biotechnology: Principles and applications
14. Khan and Khanum (1994) Fundamental of Biostastics

B.Sc.-I

BIOTECHNOLOGY

PAPER–II

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

UNIT-I

1. Concept of life, Cell as a basic unit of living system and Cell theory.
2. Diversity of Cell shape and size.
3. Prokaryotic cell structure: Function and ultra structure of cell (Gram positive and Gram negative Bacteria), Plasma membrane, Flagella, Pilli, Endospore and Capsule.
4. Eukaryotic cell: Plant cell wall and Plasma membrane.

UNIT-II

1. Cytoplasm: Structure and Functions of Endoplasmic reticulum, Ribosome, Golgi complex, Lysosomes, Nucleus, Mitochondria and Chloroplast.
2. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
3. Cell division: Mitosis and Meiosis.
4. Programmed Cell Death.

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UNIT-III

1. Mendel's Laws of Inheritance.
2. Linkage and Crossing over.
3. Chromosome variation in number and structure: Deletion, Duplication, Translocation, Inversion and Aneuploidy, Euploidy (Monoploidy and Polyploidy and its importance).

UNIT-IV

1. History, Scope and Development of Microbiology.
2. Basic techniques of Microbial Culture
3. Microbial Growth & Nutrition of Bacteria: Isolation, media sterilization- physical and chemical agents, pure culture-pour plate method, streak plate method and spread plate method.
4. General features and Economic importance of Fungi, Algae and Protozoa etc.

UNIT-V

1. Bacterial Reproduction: Conjugation, Transduction and Transformation.
2. Mycoplasma – History, Classification, Structure reproduction & Diseases.
3. Viruses – Basic features, Structure, Classification, Multiplication, Bacteriophages (Morphology, life cycle, infection and medicinal importance)

List of Books

1. C.B. Power- Cell biology, First Edition (2005), Himalaya Publishing House.
2. Gereld Karp - Dell and molecular biology, 4th Edition (2005)
3. P.K. Gupta - Cell and molecular biology, Second Edition (2003), Restogi publications.
4. C.B., Oowar - Cell biology, Third Edition (2005) Himalaya Publishing Hosue.
5. S.S. Purohit - Microbiology : Fundamentals and Applications, 6th Edition (2004)
6. R.C. Dubey and D.K. Maheshwari: Practical Microbiology. S.Chand Publication.
7. R.C. Dubey and D.K. Maheshwari,Microbiology (2006). S.Chand Publication.
8. Tortora, Funke and Case - Microbiology, An introduction, sixth Edition (1995), Benjamin/Cummings Publishing Company.
9. Prescott, Harlyey and Klein - Microbiology, Third Edition, Wm. C. Brown Publishers (1996).
10. P. Chakraoborthy - Textbook of microbiology, Second Edition (2007).
11. Prescott, Harley and Klein - Microbiology. Third Edition. Wm. C. Brown.
12. Microbial Genetics, David Freifelder, John F Cronan, Stanley R Maloy, Jones and Bartlett Publishers.
13. Elements of Human Genetics. I.I. cavalla-Sfoeza, WA Benjamin Advanced Book Program.
14. S.K Jadhav and P.K. Mahish (2018) Prayogtmak Jaivprodyogiki awam Sukshmjivigyan-Chhattisgarh Hindi Granth Academy, Raipur.

List of Practical's

MICROBIOLOGY AND BIOCHEMICAL TECHNIQUES

(1) Laboratory rules, Tools, Equipment and Other requirements in Microbiological laboratory.

(2) Micrometry – Use of ocular & stage Micrometrer.

(3) Counting of bacteria by counting chamber, by plate count.

(4)Preparation of media and cultivation techniques:
- (a) Basic liquid media (broth)
- (b) Basic Solid media, (agar slants and deep tubes)
- (c) Demonstration of selective and differential media
- (d) Isolation and enumeration of micro organisms
- (e) Isolation from air and Soil

(5)Smears and staining methods:
- (a) Preparation of bacterial smear
- (b) Gram Negative & Positive staining

(6)Methods of obtaining pure cultures
- (a) Streak plate method
- (b) Pure plate method
- (c) Spread plate method
- (d) Broth cultures

(7)Growth & Biochemical techniques
- (a) Determination of bacterial growth curve
- (b) Amylase production test
- (c) Cellulose production test
- (d) Estimation of Sugar in given solution
- (e) Extraction and separation of lipids
- (f) Estimation of proteins
- (h) Mitosis and Meiosis

(8)Biostatistics:
- (a) By Manual and by computer.
- (b) Problems on mean, mode and median.

SCHEME OF PRACTICAL EXAMINATION

Time – 4 hrs. **M. M.: 50**

1. Experiment based on culture of micro-organisms	15 Marks
2. Bacterial growth/Staining techniques	10 Marks
3. Biochemical techniques	05 Marks
4. Bio statistics	05 Marks
5. Spotting	05 Marks
6. *Viva – Voce*	05 Marks
7. Record/Sessional	05 Marks

10.6.19 10.6.19 10/6/19 10.6.19

हेमचंद यादव विश्वविद्यालय, दुर्ग (छ.ग.)

(पूर्व नाम- दुर्ग विश्वविद्यालय, दुर्ग)

रायपुर नाका दुर्ग (छ.ग.)-491001

ई मेल : academic@durguniversity.ac.in *वेब साइट : www.durguniversity.ac.in* *दूरभाष : 0788-2359400*

क्र. 2960/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रति,

प्राचार्य,
समस्त संबद्ध महाविद्यालय,
हेमचंद यादव विश्वविद्यालय,
दुर्ग (छ.ग.)

विषयः– स्नातक स्तर भाग–दो के पाठ्यक्रम विषयक।

संदर्भः– संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019।

———00———

विषयांतर्गत लेख है कि संदर्भित पत्र के माध्यम से प्राप्त स्नातक स्तर भाग–दो के निम्नलिखित कक्षा/विषयों के परिवर्तित/संशोधित पाठ्यक्रम शिक्षा सत्र 2020–21 से लागू किये जाते हैंः–

1. बी.ए. – आधार पाठ्यक्रम–हिन्दी भाषा, हिन्दी साहित्य, राजनीतिशास्त्र, अर्थशास्त्र, नृत्य, दर्शनशास्त्र, समाजशास्त्र, इतिहास, मानवविज्ञान, संस्कृत, सांख्यिकी प्राचीन भारतीय इतिहास, भूगोल, मनोविज्ञान
2. बी.एस–सी.– आधार पाठ्यक्रम–हिन्दी भाषा, जीव विज्ञान, मानवविज्ञान, बायोटेक्नोलॉजी, कम्प्यूटर साईंस, गणित, भौतिक शास्त्र, प्राणीशास्त्र, सूक्ष्मजीव विज्ञान, वनस्पतिशास्त्र, भूविज्ञान, इलेक्ट्रॉनिक्स, रसायन शास्त्र, सांख्यिकी, भूगोल।
3. बी.ए./बी.एस.सी (गृह विज्ञान) – आधार पाठ्यक्रम – हिन्दी भाषा एवं गृह विज्ञान।

उपरोक्त विषयों को शिक्षा सत्र 2020–21 से संशोधित रूप में स्नातक स्तर भाग–दो के लिए लागू किया जाता है स्नातक स्तर भाग–एक हेतु सत्र 2019–20 में लागू पाठ्यक्रम मान्य होंगे एवं भाग – तीन के पाठ्यक्रम यथावत रहेंगे।

टीपः– परिवर्तित/संशोधित पाठ्यक्रम विश्वविद्यालय के परीक्षा विभाग एवं वेबसाईट पर प्रकाशित करने हेतु वेबसाईट प्रभारी को उपलब्ध करा दी गई है।

कुलसचिव

क्र. 2961/A /अका./2020 दुर्ग, दिनांक 10/9/2020

प्रतिलिपिः–

1. संयुक्त संचालक, उच्च शिक्षा विभाग के पत्र क्र. 2456/315/आउशि/सम/2019, दिनांक 16.05.2019 परिपेक्ष्य में सूचनार्थ।
2. उपकुलसचिव, परीक्षा विभाग एवं उपकुलसचिव, गोपनीय विभाग हेमचंद यादव विश्वविद्यालय, दुर्ग।
3. कुलपति के निज सहायक एवं कुलसचिव के निज सहायक, हेमचंद यादव विश्वविद्यालय, दुर्ग।

सहा. कुलसचिव (अका.)

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-Ii examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the thirdyear.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-Iexamination.

3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognised by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIexamination.

4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-IIIexamination.

5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department orCollege.

6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in-

   (i) Foundation Course:

   (ii) Any one of the following combinations of three subjects:-

      1. Physics, Chemistry &Mathematics.
      2. Chemistry, Botany &Zoology.
      3. Chemistry, Physics &Geology.
      4. Chemistry, Botany &Geology.
      5. Chemistry, Zoology &Geology.
      6. Geology, Physics &Mathematics.
      7. Chemistry, Mathematics &Geology.
      8. Chemistry, Botany & DefenceStudies.
      9. Chemistry, Zoology & DefenceStudies
      10. Physics, Mathematics & DefenceStudies.
      11. Chemistry, Geology & DefenceStudies

12. Physics, Mathematics &Statistics
13. Physics, Chemistry &Statistics
14. Chemistry, Mathematics &Statistics.
15. Chemistry, Zoology &Anthropology.
16. Chemistry, Botany &Anthropology.
17. Chemistry, Geology &Anthropology.
18. Chemistry, Mathematics &Statistics.
19. Chemistry, Anthropology & DefenceStudies.
20. Geology, Mathematics &Statistics.
21. Mathematics, Defence Studies &Statistics
22. Anthropology, Mathematics &Statistics
23. Chemistry, Anthropology & AppliedStatistics
24. Zoology, Botany &Anthropology
25. Physics, Mathematics &Electronics.
26. Physics, Mathematics & ComputerApplication
27. Chemistry, Mathematics & ComputerApplication
28. Chemistry, Bio-Chemistry &Pharmacy
29. Chemistry, Zoology &Fisheries.
30. Chemistry, Zoology &Agriculture
31. Chemistry, Zoology &Sericulture
32. Chemistry, Botany & EnvironmentalBiology
33. Chemistry, Botany &Microbiology
34. Chemistry, Zoology &Microbiology
35. Chemistry, Industrial Chemistry &Mathematics
36. Chemistry, Industrial Chemistry &Zoology
37. Chemistry, Biochemistry,Botany
38. Chemistry, Biochemistry,Zoology
39. Chemistry, Biochemistry,Microbiology
40. Chemistry, Biotechnology,Botany
41. Chemistry, Biotechnology,Zoology
42. Geology, Chemistry &Geography
43. Geology, Mathematics &Geography
44. Mathematics, Physics &Geography
45. Chemistry, Botany &Geography

(iii) Practical in case prescribed for coresubjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to thateffect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/ group of subjects. In subject/ group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examinationseparately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementaryexamination.

10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the ThirdDivision.

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SCHEME OF EXAMINATION

	Subject	Paper	Max. Marks	Total Marks	Min. Marks
C	Environmental Studies		75	100	33
	Fild Work		25		
Foundation Course					
	Hindi Language		75	75	26
	English Language		75	75	26

नोटः– प्रत्येक में से 02 (दो) प्रश्न करने होगें । सभी प्रश्न समान अंक के होगें।

Three Elective Subject :

1.	Physics	I	50	100	33
		II	50		
		Practical		50	17
2.	Chemistry	I	33		
		II	33	100	33
		III	34		
		Practical		50	17
3.	Mathematics	I	50		
		II	50	150	50
		III	50		
4.	Botany	I	50	100	33
		II	50		
		Practical		50	17
5.	Zoology	I	50	100	33
		II	50		
		Practical		50	17
6.	Geology	I	50	100	33
		II	50		
		Practical	50		17
7.	Statistics	I	50	100	33
		II	50		
		Practical		50	17
8.	Anthropology	I	50	100	50
		II	50		
		Practical		50	17

Subject	Paper	Max. Marks	Total Marks	Min. Marks
CompulsorySubject–FoundationCourse:				
9. DefenseStudies	I	50	100	33
	II	50		
	Practical		50	17
10. MicroBiology	I	50	100	33
	II	50		
	Practical		50	17
11. ComputerSciences	I	50	100	33
	II	50		
	Practical		50	17
12. Information Technology	I	50	100	33
	II	50		
	Practical		50	17
13.IndustrialChemistry	I	34		
	II	33	100	33
	III	33		
	Practical		50	17
14. BioChemistry	I	50		
	II	50	100	33
15.BioTechnology	Practical	50	50	17
	I			
	II	50	100	33
	Practical		50	17

USE OF CALCULATORS

The Students of Degree/P.G. Classes will be permitted to use of Calculators in the examination hall from annual 1986 examnination on the following conditions as per decision of the standing committee of the Academic Council at its meeting held on 31-1-1986.

1. Student will bring their own Calculators.
2. Calculators will not be provided either by the University or examination centres.
3. Calculators with, memoty and following variables be permitted +, -, x, ¸ square, reciprocal, expotentials log, square root, trignometric functions, wize, sine, cosine, tangent etc. factiorial summation, xy, yx and in the light of objective approval of merits and demerits of the viva only will be allowed.

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संशोधित पाठ्यक्रम
बी.ए./बी.एस–सी./बी.कॉम./बी.एच.एस.–सी.
भाग – दो, आधार पाठ्यक्रम
प्रश्न पत्र – प्रथम (हिन्दी भाषा) (पेपर कोड – 0171) **पूर्णांक– 75**

खण्ड – क निम्नलिखित 5 लेखकों के पाठ शामिल होंगे – **अंक–35**

1. महात्मा गांधी	–	चोरी और प्रायश्चित
2. आचार्य नरेंद्र देव	–	युवकों का समाज में स्थान
3. वासुदेव शरण अग्रवाल	–	मातृभूमि
4. हरि ठाकुर	–	डॉ. खूबचंद बघेल
5. पं. माधवराव सप्रे	–	सम्भाषण–कुशलता

खण्ड–ख हिन्दी भाषा और उसके विविध रूप **अंक–16**

1. कार्यालयीन भाषा
2. मीडिया की भाषा
3. वित्त एवं वाणिज्य की भाषा
4. मशीनी भाषा

खण्ड–ग हिन्दी की व्याकरणिक कोटियॉ **अंक–24**

संज्ञा, सर्वनाम, विशेषण, क्रिया विशेषण,
समास, संधि एवं संक्षिप्तियां
अनुवाद व्यवहार : अंग्रेजी से हिन्दी में अनुवाद

इकाई विभाजन–

इकाई– 1 चोरी और प्रायश्चित : महात्मा गांधी / कार्यालयीन भाषा, मीडिया की भाषा

इकाई– 2 युवकों का समाज में स्थान : आचार्य नरेन्द्र देव / वित एवं वाणिज्य की भाषा, मशीनी भाषा

इकाई– 3 मातृभूमिः वासुदेवशरण अग्रवाल / संज्ञा सर्वनाम, विशेषण, क्रिया विशेषण

इकाई– 4 डॉ. खूबचंद बघेल : हरि ठाकुर/समास, संधि,

इकाई– 5 सम्भाषण–कुशलता : पं. माधवराव सप्रे, / अनुवाद – अंग्रेजी से हिन्दी में अनुवाद, संक्षिप्तियॉ

मूल्यांकन योजना –

प्रत्येक इकाई से एक–एक प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के 15 अंक होंगे । प्रत्येक इकाई को दो–दो खण्डों (क्रमश' 'क' और 'ख' में) विभक्त करते हुए निर्धारित पाठ से 8 एवं शेष पाठ्य सामग्री से 7 अंक के प्रश्न होंगे। इस प्रकार पूरे प्रश्न–पत्र के पूर्णांक 75 होंगे।

पाठ्यक्रम संशोधन का औचित्य : विद्यार्थी चर्चित एवं सुप्रसिद्ध व्यक्तियों के लेख के माध्यम से समाज एवं राष्ट्रहित के साथ–साथ व्यक्तित्व विकास विषयक मुद्दों से परिचित हो सके तथा व्याकरिणक एवं भाषा विषयक प्रस्तावित पाठ्यक्रम के माध्यम से हिन्दी भाषा संबंधित प्रयोग पक्ष से परिचित होते हुए प्रतियोगी परीक्षाओं की दृष्टि से ज्ञानार्जन कर सके।

ENGLISH LANGUAGE (Paper Code-1132)

B.A. / B.Sc. /B.COM. /B.H. Sc. - II

M.M.75

The question paper for B.A. /B.Sc./B.Com./B.H.Sc., English Language and cultural valuers shall comprise the following units:

UNIT-I Short answer questions to be passed by (Five short answer questions of three marks each) 15 Marks

UNIT-II (a) Reading comprehension of an unseen passage 05 Marks

(b) Vocabulary

UNIT-III Report-Writing 10 Marks

UNIT-IV Expansion of an idea 10 Marks

UNIT-V Grammar and Vocabulary based on the prescribed text book. 20+15Marks

Note: Question on all the units shall asked from the prescribed text which will Comprise Specimens of popular creative/writing and the following it any

a Matter & technology

i. State of matter and its structure

ii. Technology (Electronics Communication, Space Science)

b Our Scientists & Institutions

I. Life & work of our eminent scientist Arya Bhatt. Kaurd Charak Shusruta, Nagarjuna, J.C. Bose and C.V. Raman, S. Rmanujam, Homi J. Babha Birbal Sahani.

II. Indian Scientific Institutions (Ancient & Modern)

Books Prescribed:

Foundation English for U.G. Second Year - Published by M.P. Hindi Granth Academy, Bhopal.

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

NEW CURRICULUM OF B.Sc. PART II

SESSION 2019-20

CHEMISTRY

The new curriculum will comprise of three papers of 33, 33 and 34 marks each and practical work of 50 marks. The Curriculum is to be completed in 180 working days as per UGC norms and conforming to the directives of Govt. of Chhattisgarh. The theory papers are of 60 hrs. each duration and practical work of 180 hrs duration.

Paper – I

INORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF TRANSITION SERIES ELEMENTS

Transition Elements: Position in periodic table, electronic configuration, General Characteristics, *viz*., atomic and ionic radii, variable oxidation states, ability to form complexes, formation of coloured ions, magnetic moment μ_{so} (spin only) and μ_{eff} and catalytic behaviour. General comparative treatment of 4d and 5d elements with their 3d analogues with respect to ionic radii, oxidation states and magnetic properties.

UNIT-II

A. OXIDATION AND REDUCTION: Redox potential, electrochemical series and its applications, Principles involved in extraction of the elements.

B. COORDINATION COMPOUNDS: Werner's theory and its experimental verification, IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelates, polynuclear complexes.

UNIT-III

COORDINATION CHEMISTRY

Valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, Crystal field splitting and stabilization energy, measurement of 10 Dq (Δ_o), CFSE in weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq (Δ_o, Δ_t). Octahedral vs. tetrahedral coordination.

24.6.2019 24.6.19

UNIT-IV

A. CHEMISTRY OF LANTHANIDE ELEMENTS

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

B. CHEMISTRY OF ACTINIDES

General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from uranium, similarities between the latter actinides and the latter lanthanides

UNIT-V

A. ACIDS BASES : Arrhenius, Bronsted-Lowry, conjugate acids and bases, relative strengths of acids and bases, the Lux-flood, Solvent system and Lewis concepts of acids and bases.

B. NON-AQUEOUS SOLVENTS

.Physical properties of a solvent, types of solvents and their general characteristics, reaction in non-aqueous solvents with reference to liquid ammonia and liquid sulphur dioxide, HF, H_2SO_4 , Ionic liquids.

REFERENCE BOOKS

1. Basic Inorganic Chemistry, F. A. Cotton, G. Wilkinson and P. L. Gaus, Wiley
2. Concise Inorganic Chemistry, J. D. Lee, ELBS
3. Concepts of Models of Inorganic Chemistry, B. Douglas, D. Mc Daniel and J. Alexander, John Wiley.
4. Inorganic Chemistry, D. E. Shriver, P. W. Atkins and C. H. Langford, Oxford.
5. Inorganic Chemistry, W. W. Porterfield, Addison – Wiley.
6. Inorganic Chemistry, A. G. Sharp, ELBS.
7. Inorganic Chemistry, G. L. Miessler and D. A. Tarr, Prentice Hall.
8. Advanced Inorganic Chemistry, Satya Prakash.
9. Advanced Inorganic Chemistry, Agarwal and Agarwal
10. Advanced Inorganic Chemistry, Puri, Sharma, S. Naginchand
11. Inorganic Chemistry, Madan, S. Chand
12. Aadhunik Akarbanic Rasayan, A. K. Shrivastav & P. C. Jain, Goel Pub
13. Uchchattar Akarbanic Rasayan, satya Prakash & G. D. Tuli, Shyamal Prakashan
14. Uchchattar Akarbanic Rasayan, Puri & Sharma
15. Selected topic in Inorganic Chemistry by Madan Malik & Tuli, S. Chand.

24.6.2019 24.6.19

Paper – II

ORGANIC CHEMISTRY 60 Hrs., Max Marks 33

UNIT-I

CHEMISTRY OF ORGANIC HALIDES

Alkyl halides: Methods of preparation, nucleophilic substitution reactions – S_N1, S_N2 and S_N^i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution, elimination reactions.

Aryl halides: Preparation, including preparation from diazonium salts, Nucleophilic Aromatic Substitution; SNAr, Benzyne mechanism. Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.

UNIT-II

ALCOHOLS

A. Alcohols: Nomenclature, preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvaelt-Blanc Reduction for the preparation of alcohols, Dihydric alcohols – methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol-pinacolone rearrangement.

B. Trihydric alcohols - Nomenclature, methods of formation, chemical reactions of glycerol.

PHENOLS

A. Structure and bonding in phenols, physical properties and acidic character, Comparative acidic strength of alcohols and phenols, acylation and carboxylation.

B. Mechanism of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Hauben-Hoesh reaction, Lederer-Manasse reaction and Reimer-Tiemann reaction.

UNIT-III

ALDEHYDES AND KETONES

A. Nomenclature, structure and reactivity of carbonyl group. General methods of preparation of aldehydes and ketones.

Mechanism of nucleophilic addition to carbonyl groups: Benzoin, Aldol, Perkin and Knoevenagel condensation. Condensation with ammonia and its derivatives, Wittig reaction, Mannich reaction, Beckmann and Benzil- Benzilic rearrangement.

B. Use of acetate as protecting group, Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmensen reduction, Wolf-Kishner reaction, $LiAlH_4$ and $NaBH_4$ reduction. Halogenation of enolizable ketones, An introduction to α,β-unsaturated aldehydes and ketones.

24.6.2019 24.6.19

UNIT-IV

A. CARBOXYLIC ACIDS

Preparation, Structure and bonding, Physical and chemical properties including, acidity of carboxylic acids, effects of substituents on acid strength, Hell-Volhard Zeilinsky reaction. Reduction of carboxylic groups, Mechanism of decarboxylation.

Di carboxylic acids: Methods of formation and effect of heat and dehydrating agents, Hydroxyacids.

B. CARBOXYLIC ACID DERIVATIVES

Structure of acid chlorides, esters, amides and acid anhydrides, Relative stability of acyl derivatives.

Physical properties, inter-conversion of acid derivatives by nucleophilic acyl substitution.

Mechanism of acid and base catalyzed esterification and hydrolysis.

UNIT-V

ORGANIC COMPOUNDS OF NITROGEN

A. Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes. Mechanism of nucleophilic substitution in nitroarenes and their reduction in acidic, neutral and alkaline medium.

B. Reactivity, structure and nomenclature of amines, physical properties. Stereochemistry of amines. Separation of mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Preparation of alkyl and aryl amines (reduction of nitro compounds and nitriles), reductive amination of aldehydic and ketonic compounds. Gabriel-Phthalimide reaction, Hofmann-Bromamide reaction, Reactions of amines, electrophilic aromatic substitution of aryl amines, Reaction of amines with nitrous acid. Synthetic transformations of aryl diazonium salts, Azo coupling.

REFERENCE BOOKS

1. Organic Chemistry, Morrison and Boyd, Prentice-Hall.
2. Organic Chemistry, L. G. Wade Jr. Prentice Hall.
3. Fundamentals of Organic Chemistry, Solomons, John Wiley.
4. Organic Chemistry, Vol I, II, III S. M. Mukherjee, S. P. Singh and R. P. Kapoor, Wiley Easters (New Age).
5. Organic Chemistry, F. A. Carey, McGraw Hill.
6. Introduction to Organic Chemistry, Struiweisser, Heathcock and Kosover, Macmillan.
7. Organic Chemistry, P. L. Soni.
8. Organic Chemistry, Bahl and Bahl.
9. Organic Chemistry, Joginder Singh.
10. Carbanic Rasayan, Bahl and Bahl.
11. Carbanic Rasayan, R. N. Singh, S. M. I. Gupta, M. M. Bakidia & S. K. Wadhwa.
12. Carbanic Rasayan, Joginder Singh.

Paper – III
PHYSICAL CHEMISTRY **60 Hrs., Max Marks 34**

UNIT-I

A. THERMODYNAMICS-I

Intensive and extensive variables; state and path functions; isolated, closed and open systems; Zeroth law of thermodynamics. First law: Concept of heat, work, internal energy and statement of first law; enthalpy, Relation between heat capacities, calculations of q, w, U and H for reversible, irreversible and free expansion of gases under isothermal and adiabatic conditions. Joule-Thomson expansion, inversion temperature of gases, expansion of ideal gases under isothermal and adiabatic condition

B. THERMO CHEMISTRY

Thermochemistry, Laws of Thermochemistry, Heats of reactions, standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoff's equations) and pressure on enthalpy of reactions, Adiabatic flame temperature, explosion temperature.

UNIT-II

A. THERMODYNAMICS-II

Second Law of Thermodynamics: Spontaneous process, Second law, Statement of Carnot cycle and efficiency of heat engine, Carnot's theorem, thermodynamic state of temperature.

Concept of entropy: Entropy change in a reversible and irreversible process, entropy change in isothermal reversible expansion of an ideal gas, entropy change in isothermal mixing of ideal gases, physical signification of entropy, Molecular and statistical interpretation of entropy.

B. Gibbs and Helmholtz free energy, variation of G and A with pressure, volume, temperature, Gibbs-Helmholtz equation, Maxwell relations, Elementary idea of Third law of Thermodynamics, concept of residual entropy, calculation of absolute entropy of molecule.

UNIT III

A CHEMICAL EQUILIBRIUM

Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases. Concept of Fugacity, Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient. Coupling of exergonic and endergonic reactions. Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Thermodynamic derivation of relations between the various equilibrium constants Kp, Kc and Kx. Le Chatelier principle (quantitative treatment). Equilibrium between ideal gas and a pure condensed phase.

B IONIC EQUILIBRIA

Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono protic acids (exact treatment). Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.

UNIT-IV

PHASE EQUILIBRIUM

A. Phase rule, Phase, component and degree of freedom, derivation of Gibbs phase rule, Clausius-Claperon equation and its applications to Solid-Liquid, Liquid-Vapor and Solid-Vapor, limitation of phase rule, applications of phase rule to one component system: Water system and sulphur system.

Application of phase rule to two component system: Pb-Ag system, desilverization of lead, Zn-Mg system, Ferric chloride-water system, congruent and incongruent melting point and eutectic point.

Three component system: Solid solution liquid pairs.

B. Nernst distribution law, Henry's law, application, solvent extraction

UNIT V

PHOTOCHEMISTRY

Characteristics of electromagnetic radiation, Interaction of radiation with matter, difference between thermal and photochemical processes, Lambert-Beer's law and its limitations, physical significance of absorption coefficients. Laws of photochemistry: Grothus-Drapper law, Stark-Einstein law, quantum yield, actinometry, examples of low and high quantum yields, Photochemical equilibrium and the differential rate of photochemical reactions, Quenching, Role of photochemical reaction in biochemical process.

Jablonski diagram depicting various process occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), photosensitized reactions, energy transfer processes {simple examples), photostationary states, Chemiluminescence.

REFERENCE BOOKS

1. Physical Chemistry, G. M. Barrow, International student edition, McGraw Hill.
2. University General Chemistry, C. N. R. Rao, Macmillan.
3. Physical Chemistry, R. A. Alberty, Wiley Eastern.
4. The elements of physical chemistry, Wiley Eastern.
5. Physical Chemistry through problems, S. K. Dogra & S. Dogra, Wiley Eastern.
6. Physical Chemistry, B. D. Khosla,.
7. Physical Chemistry, Puri & Sharma.
8. Bhautik Rasayan, Puri, Sharma and Pathania, Vishal Publishing Company.
9. Bhautik Rasayan, P. L. Soni.
10. Bhautik Rasayan, Bahl and Tuli.
11. Physical Chemistry, R. L. Kapoor, Vol I-IV **.**
12. Chemical kinetics, K. J. Laidler, Pearson Educations, New Delhi (2004).

Paper –IV

LABORATORY COURSE

INORGANIC CHEMISTRY

Qualitative semimicro analysis of mixtures containing 5 radicals. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-}, NO_2^- , S^{2-}, SO_3^{2-},$S_2O_3^{2-}$, CH_3COO^-, F^- ,Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-}, $C_2O_4^{2-}$, PO_4^{3-}, NH_4^+ , K^+, Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}, Sn^{2+}, Sb^{3+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}.

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-}, NO_2^- and NO_3^-, Cl^-, Br^-, and I^-.

Volumetric analysis

(a) Determination of acetic acid in commercial vinegar using NaOH.

(b) Determination of alkali content-antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous & ferric by dichromate method.

(f) Estimation of copper using thiosulphate.

- Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions: i. Ni (II) and Co (II) ii. Fe (III) and Al (III)

ORGANIC CHEMISTRY

- Detection of elements (X, N, S).
- Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols, nitro, amine, amide, and carbonyl compounds, carbohydrates)
- Preparation of Organic Compounds:
  (i) m-dinitrobenzene, (ii) Acetanilide, (iii) Bromo/Nitro-acetanilide, (iv) Oxidation of primary alcohols-Benzoic acid from benzylacohol, (v) azo dye.

24.6.2019 24.6.19

PHYSICAL CHEMISTRY

Transition Temperature

- Determination of the transition temperature of the given substance by thermometric/ dialometric method (e.g. $MnCl_2.4H_2O/SrBr_2.2H_2O$).

Thermochemistry

- Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- To determine the solubility of benzoic acid at different temperature and to determine ΔH of the dissolution process.
- To determine the enthalpy of neutralization of a weak acid/ weak base versus strong base/ strong acid and determine the enthalpy of ionization of the weak acid/ weak base.
- To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.

Phase Equilibrium

- To study the effect of a solute (e.g. NaCl, Succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
- To construct the phase diagram of two component system (e.g. diphenylamine–benzophenone) by cooling curve method.
- Distribution of acetic/ benzoic acid between water and cyclohexane.
- Study the equilibrium of at least one of the following reactions by the distribution method:
  (i) $I_2(aq) + I \rightarrow I_3(aq)^{2+}$
  (ii) $Cu^{2+}(aq) + nNH_3 \rightarrow Cu(NH_3)n$

Molecular Weight Determination

Determination of molecular weight by Rast Camphor and Landsburger method.

Note: **Experiments may be added/ deleted subject to availability of time and facilities.**

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000). 22
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011). Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
6. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York

Hrs.5 PRACTICAL EXAMINATION M.M.50

Three Experiments are to be performed.

1. Inorganic – Qualitative semimicro analysis of mixtures. **12 marks**

OR

One experiment from synthesis and analysis by preparing the standard solution.

2. (a) Identification of the given organic compound & determine its M.Pt./B.Pt.

6 marks

(b) Determination of Rf value and identification of organic compounds by paper chromatography. **6 marks**

3. Any one physical experiment that can be completed in two hours including calculations.

12 marks

4. Viva **10 marks**

5. Sessional **04 marks**

In case of Ex-Students one marks will be added to each of the experiment.

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Session 2019-20

PHYSICS

B.Sc. Part-II

Paper-I

THERMODYNAMICS, KINETIC THEORY AND STATISTICAL PHYSICS

Unit-1 The laws of thermodynamics : The Zeroth law, first law of thermodynamics, internal energy as a state function, reversible and irreversible change, Carnot's cycle, carnot theorem, second law of thermodynamics. Claussius theorem inequality. Entropy, Change of entropy in simple cases (i) Isothermal expansion of an ideal gas (ii) Reversible isochoric process (iii) Free adiabatic expansion of an ideal gas. Concept of entropy, Entropy of the universe. Entropy change in reversible and irreversible processes, Entropy of Ideal gas, Entropy as a thermodynamic variable, S-T diagram, Principle of increase of entropy. The thermodynamic scale of temperature, Third law of thermodynamics, Concept of negative temperature.

Unit-2 Thermodynamic functions, Internal energy, Enthalpy, Helmholtz function and Gibb's free energy, Maxwell's thermodynamical equations and their applications, TdS equations, Energy and heat capacity equations Application of Maxwell's equation in Joule-Thomson cooling, adiabatic cooling of a system, Van der Waals gas, Clausius-Clapeyron heat equation. Blackbody spectrum, Stefan-Boltzmann law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.

Unit-3 Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Transport phenomena in gases: Molecular collisions mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants.

Unit-4 The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, statistical postulates. Concept of Gibb's ensemble, accessible and inaccessible states. Concept of phase space, γ phase space and μ phase space. Equilibrium before two systems in thermal contact, probability and entropy, Boltzmann entropy relation. Boltzmann canonical distribution law and its applications, law of equipartition of energy.

Transition to quantum statistics: 'h' as a natural constant and its implications, cases of particle in a one-dimensional box and one-dimensional harmonic oscillator.

Unit-5 Indistinguishability of particles and its consequences, Bose-Einstein & Fermi-Dirac conditions, Concept of partition function, Derivation of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics, Limits of B-E and F-D statistics to M-B statistics. Application of B-E statistics to black body radiation, Application of F-D statistics to free electrons in a metal.

TEXT AND REFERENCE BOOKS:

1. B.B. Laud, "Introduction to Statistical Mechanics" (Mcmillan 1981)
2. F. Reif : "Statistical Physics" (Mcgraw-Hill, 1998).
3. K, Haung : "Statatistical Physics" (Wiley Eastern, 1988).
4. Thermal and statistical Physics: R.K. Singh, Y.M. Gupta and S. Sivraman.
5. Statistical Physics: Berkeley Physics Course, Vol. 5
6. Physics (Part-2): Editor, Prof. B.P. Chandra, M.P. Hindi Granth Academy.
7. Heat and Thermodynamics: K.W. Zeemansky.
8. Thermal Physics: B.K. Agarwal.
9. Heat and Thermodynamics: Brij Lal and N. Subramanyam.
10. Heat and Thermodynamics: Dayal, Verma and Pandey.
11. A Treatise on Heat: M.N. Saha and B.N. Srivastava.

(10)

Session 2019-20

PHYSICS

Paper-II
WAVES, ACOUSTICS AND OPTICS

Unit-1 Waves in media: Speed of transverse waves on uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves. Waves over liquid surface: gravity waves and ripples. Group velocity and phase velocity and relationship between them. Production and detection of ultrasonic and infrasonic waves and applications.

Reflection, refraction and diffraction of sound : Acoustic impedance of a medium, percentage reflection & refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging.

Unit-2 Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. Cardinal points of an optical system, thick lens and lens combinations. Lagrange equation of magnification, telescopic combinations, telephoto lenses. Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens.

Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces. (Ramsdon and Hygen's eyepieces).

Unit-3 Interference of light: The principle of superpositions, two slit interference, coherence requirement for the sources, optical path retardations, Conditions for sustained interference, Theory of interference, Thin films. Newton's rings and Michelson interferometer and their applications, its application for precision determinations of wavelength, wavelength difference and the width of spectral lines. Multiple beam interference in parallel film and Fabry-Perot interferometer. Rayleigh refractometer, Twyman-Green interferometer and its uses.

Unit-4 Diffraction, Types of Diffraction, Fresnel's diffraction, half-period zones, phasor diagram and integral calculus methods, the intensity distribution, Zone plates, diffraction due to straight edge, Fraunhofer diffraction due to a single slit and double slit, Diffraction at N-Parallel slit, Plane Diffraction grating, Rayleigh criterion, resolving power of grating , Prism, telescope.

Polarized light and its mathematical representation, Production of polarized light by reflection, refraction and scattering. Polarization by double refraction and Huygen's theory, Nicol prism, Retardation plates, Production and analysis of circularly and elliptically polarized light. Optical activity and Fresnel's theory, Biquartz polarimeter.

Unit-5 Laser system: Basic properties of Lasers, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients, Spontaneous and induced emissions, conditions for laser action, population inversion, Types of Laser : Ruby and, He-Ne laser and. Applications of laser : Application in communication, Holography and Basics of non linear optics and Generation of Harmonic.

TEXT AND REFERENCE BOOKS:

1. A.K. Ghatak, 'Physical Optics'
2. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
3. K.D. Moltev; 'Optics' (Oxford University Press)
4. Sears: 'Optics'
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
6. B.B. Laud: Lasers and Non-linear Optics (Wiley Eastern 1985)
7. Smith and Thomson: 'Optics' (John Wiley and Sons)
8. Berkely Physics Courses: Vol.-III, 'Waves and Oscillations'
9. I.G. Main, 'Vibrations and Waves' (Cambridge University Press)
10. H.J. Pain: 'The Physics of Vibrations and Waves' (MacMillan 1975)
11. Text Book of Optics: B.K. Mathur
12. B.Sc. (Part III) Physics: Editor: B.P. Chandra, M.P. Hindi Granth Academy.
13. F. Smith and J.H. Thomson, Manchester Physics series: optics (John wiley, 1971)
14. Born and Wolf : 'Optics'.
15. Physical Optics: B. K. Mathur and T. P. Pandya.
16. A textbook of Optics: N. Subrahmanyam, Brijlal and M. N. Avadhanulu.
17. Geometrical and Physical Optics: Longhurst.
18. Introduction to Modern Optics: G. R. Fowels.
19. Optics: P. K. Srivastav.

(12)

Session 2019-20

PHYSICS

PRACTICALS

Minimum 16 (Eight from each group)

Experiments out of the following or similar experiments of equal standard

1. Study of Brownian motion.
2. Study of adiabatic expansion of a gas.
3. Study of conversion of mechanical energy into heat.
4. Heating efficiency of electrical kettle with varying voltage.
5. Study of temperature dependence of total radiation.
6. Study of temperature dependence of spectral density of radiation.
7. Resistance thermometry.
8. Thermo emf thermometry.
9. Conduction of heat through poor conductors of different geometries.
10. Experimental study of probability distribution for a two-option system using a coloured dice.
11. Study of statistical distribution on nuclear disintegration data (GM counter used as a black box).
12. Speed of waves on a stretched strings.
13. Studies on torsional waves in a lumped system.
14. Study of interference with two coherent source of sound.
15. Chlandi's figures with varying excitation and loading points.
16. Measurements of sound intensities with different situations.
17. Characteristics of a microphone-loudspeakers system
18. Designing an optical viewing system.
19. Study of monochromatic defects of images.
20. Determining the principle point of a combination of lenses.
21. Study of interference of light (biprism or wedge film).
22. Study of diffraction at a straight edge or a single slit.
23. Study of F-P etalon fringes.
24. Study of diffraction grating and its resolving power.
25. Resolving power of telescope system.
26. Polarization of light by reflection; also cos-squared law.
27. Study of optical rotation for any system.
28. Study of laser as a monochromatic coherent source.
29. Study of a divergence of laser beam.
30. Calculation of days between two dates of a year.
31. To check if triangle exists and the type of a triangles.
32. To find the sum of the sine and cosines series and print out the curve.

33. To solve simultaneous equation by elimination method.
34. To prepare a mark-list of polynomials.
35. Fitting a straight line or a simple curve
36. Convert a given integer into binary and octal systems and vice versa .
37. Inverse of a matrix.
38. Spiral array.

TEXT AND REFERENCE BOOKS

1. D.P. Khandelwal, Optics and Atomic physics (Himalaya Publishing house, Bombay 1988).
2. D.P. Khandelwal, A Laboratory Manual for Undergraduate Classes (Vani Publishing House, New Delhi).
3. S. Lipschutz and a Poe, Schaum's outline of theory and Problems of Programming with Fortran(McGraw-hill Book Company 1986).
4. C Dixon, Numerical Analysis .

MATHEMATICS

There shall be three compulsory papers. Each paper of 50 marks is divided into five units and each unit carry equal marks.

B.Sc. Part-II
Paper-I
ADVANCED CALCULUS

UNIT-I Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion. Series of non-negative terms. Comparison tests, Cauchy's integral test, Ratio tests, Raabe's, Logarithmic, De Morgan and Bertrand's tests. Alternating series, Leibnitz's theorem. Absolute and conditional convergence.

UNIT-II Continuity, Sequential continuity, Properties of continuous functions, Uniform continuity, Chain rule of differentiability, Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives, Taylor's theorem with various forms of remainders.

UNIT-III Limit and continuity of functions of two variables. Partial differentiation. Change of variables. Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables. Jacobians.

UNIT-IV Envelopes, evolutes. Maxima, minima and saddle points of functions of two variables. Lagrange's multiplier method.

UNIT-V Beta and Gamma functions, Double and triple integrals, Dirichlet's integrals, Change of order of integration in double integrals.

REFERENCES :

1. Gabriel Klaumber, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.
2. T.M. Apostol, Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
3. R.R. Goldberg, Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970.
4. D. Soma Sundaram and B. Choudhary, A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. P.K. Jain and S.K. Kaushik, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
6. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd., Allahabad.
7. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Co., New York.
8. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd., Allahabad.
9. S.C. Malik, Mathematical Analysis, Wiley Eastern Ltd., New Delhi.
10. O.E. Stanaitis, An Introduction to Sequences, Series and Improper Integrals, Holden-Dey, Inc., San Francisco, California.
11. Earl D. Rainville, Infinite Series, The Macmillan Company, New York.
12. Chandrika Prasad, Text Book on Algebra and Theory of Equations, Pothishala Pvt. Ltd., Allahabad.
13. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.
14. Shanti Narayan, A Course of Mathematical Analysis, S.Chand and Company, New Delhi.

B.Sc. Part-II
Paper-II
DIFFERENTIAL EQUATIONS

UNIT-I Series solutions of differential equations- Power series method, Bessel and Legendre functions and their properties-convergence, recurrence and generating relations, Orthogonality of functions, Sturm-Liouville problem, Orthogonality of eigen-functions, Reality of eigen values, Orthogonality of Bessel functions and Legendre polynomials.

UNIT-II Laplace Transformation- Linearity of the Laplace transformation, Existence theorem for Laplace transforms, Laplace transforms of derivatives and integrals, Shifting theorems. Differentiation and integration of transforms. Convolution theorem. Solution of integral equations and systems of differential equations using the Laplace transformation.

UNIT-III Partial differential equations of the first order. Lagrange's solution, Some special types of equations which can be solved easily by methods other than the general method, Charpit's general method of solution.

UNIT-IV Partial differential equations of second and higher orders, Classification of linear partial differential equations of second order, Homogeneous and non-homogeneous equations with constant coefficients, Partial differential equations reducible to equations with constant coefficients, Monge's methods.

UNIT-V Calculus of Variations- Variational problems with fixed boundaries- Euler's equation for functionals containing first order derivative and one independent variable, Extemals, Functionals dependent on higher order derivatives, Functionals dependent on more than one independent variable, Variational problems in parametric form, invariance of Euler's equation under coordinates transformation.

Variational Problems with Moving Boundaries- Functionals dependent on one and two functions, One sided variations.

Sufficient conditions for an Extremum- Jacobi and Legendre conditions, Second Variation. Variational principle of least action.

REFERENCES :

1. Erwin Kreysizig, Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999.
2. D.A. Murray, Introductory Course on Differential Equations, Orient Longman, (India), 1967.
3. A.R. Forsyth, A Treatise on Differential Equations, Macmillan and Co. Ltd., London.
4. Lan N. Sneddon, Elements of Partial Differential Equations, McGraw-Hill Book Company, 1988.
5. Francis B. Hilderbrand, Advanced Calculus for Applications, Prentice Hall of India Pvt. Ltd., New Delhi, 1977.
6. Jane Cronin, Differential equations, Marcel Dekkar, 1994.
7. Frank Ayres, Theory and Problems of Differential Equations, McGraw-Hill Book Company, 1972.
8. Richard Bronson, Theory and Problems of Differential Equations, McGraw-Hill, Inc., 1973.
9. A.S. Gupta, Calculus of variations with-Applications, Prentice-Hall of India, 1997.
10. R. Courant and D. Hilbert, Methods of Mathematical Physics, Vots. I & II, Wiley-Interscience, 1953.
11. I.M. Gelfand and S.V. Fomin, Calculus of Variations, Prentice-Hill, Englewood Cliffs (New Jersey), 1963.
12. A.M. Arthurs, Complementary Variational Principles, Clarendon Press, Oxford, 1970.
13. V. Kornkov, Variational Principles of Continuum Mechanics with Engineering Applications, Vol. I, Reidel Publ. : Dordrecht, Holland, 1985.
14. T. Oden and J.N. Reddy, Variational Methods in Theoretical Mechanics, Springer-Verlag, 1976.

B.Sc. Part-II
Paper-III
MECHANICS

STATICS

UNIT-I Analytical conditions of Equilibrium, Stable and unstable equilibrium. Virtual work, Catenary.

UNIT-II Forces in three dimensions, Poinsot's central axis, Null lines and planes.

DYNAMICS

UNIT-III Simple harmonic motion. Elastic strings. Velocities and accelerations along radial and transverse directions, Projectile, Central orbits.

UNIT-IV Kepler's laws of motion, velocities and acceleration in tangential and normal directions, motion on smooth and rough plane curves.

UNIT-V Motion in a resisting medium, motion of particles of varying mass, motion of a particle in three dimensions, acceleration in terms of different co-ordinate systems.

REFERENCES :

1. S.L. Loney, Statics, Macmillan and Company, London.
2. R.S. Verma, A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad.
3. S.L. Loney, An Elementary Treatise on the Dynamics of a particle and of rigid bodies, Cambridge University Press, 1956.

B.Sc.–II (BOTANY) PAPER-I

(PLANT TAXONOMY, ECONOMIC BOTANY, PLANT ANATOMY AND EMBRYOLOGY)

UNIT-I

Bentham and Hooker system of classification.Binomial Nomenclature, International Code of Nomenclature for Algae, Fungi, and plants (IUCN), Typification, numerical Taxonomy and chemotaxonomy. Preservation of Plant material and Herbarium techniques.Important botanical gardens and herbaria of India, Kew Botanical garden, England.

UNIT-II

Systematic position, distinguishing characters and economic importance of the following families, Ranunculaceae, Magnoliaceae, Brassicaeae, Rosaceae, Papaveraceae, Caryophyllaceae, Rutaceae, Cucurbitaceae, Apiaceae, Rubiaceae, Apocynaceae, Asclepiadaceae, Solanaceae, Malvaceae, Convolvulaceae, Orchidaceae, Acanthaceae, verbenaceae, Lamiaceae, Asteraceae, Fabaceae, Euphorbiaceae, Poaceae and Liliaceae.

UNIT-III

Economic Botany: Botanical name, family, part used and uses of the following economically important plants, fiber yielding plants; Cotton, jute, sun, hemp, coir.Timber yielding plants: Sal, Teak, Shisham and Pine.Medicinal plants: Kalmegh, Ashwangandha, Ghritkumari, Giloy, Brahmi, sarpgandha, ---of medicinal plants of C.G. Food plants: Pearl millet, Buck of wheat, Sorghum, Soyabean, gram, Ground nut, Sugarcane and Potato.Fruit plants: Pear, Peach, Litchi. Spices: Cinnamon, Turmeric, Ginger, Asafoetida and Cumin. Beverages : Tea, Coffee Rubber Cultivation of important flowers: Chrysanthemum, Dahelia, Biodiesel plants Jatropha, Pongamia Ethnobotany in context of Chhattisgarh.

UNIT-IV

Plant Anatomy: Root and shoot apical meristems theories of root and shoot apex organization, permanent tissues, anatomy of root, stem and leaf of dicot and monocot, secondary growth in root and stem, Anatomical anomalies in the primary structure of stems (Nyctanthes, Boerhaavia, Casuarina), Anamolous secondary growth in Dracaena, Bignonia, Laptadenia.

UNIT-V

Embryology: Flower as a reproductive organ, anther, microsporogenesis, types of ovules, megasporogenesis, development of male and female gametophyte, pollination, mechanisms, self incompatibility, fertilization, endosperm, embryo, polyembryonoy, apomixes and parthenocarpy.

Books Recommended:

13.6.19 13/6/19 13.6.19 13.6.19

Singh, Pandey,Jain. ***Diversity and Systematics of Seed Plants***, Rastogi Publications Merrut

Sharma OP, ***Plant Taxonomy,*** Tata Mc Graw Hill, New Delhi

Pandey BP, ***Taxonomy of Angiosperms,*** S. Chand Publishing, New Delhi

Pandey, BP, ***Plant Anatomy,*** S.Chand Publishing, New Delhi

Pandey, BP, ***Economic Botany,*** S.Chand Publishing, New Delhi

Bhojwani, SS and Bhatanagar SP, ***Embryology of Angiosperm***, Vikas Publication House, New Delhi

Singh, Pandey, Jain, ***Embryology of Angiosperms***, Rastogi Publication, Meerut

Sharma, V, Alum, A. ***Ethnobotany***, Rastogi Publications, Meerut

Tayal, MS ***Plant Anatomy***, Rastogi Publication, Meerut

(Dr. J.N. Verma) (Dr.Rekha Pimpalgaonkar) (Dr.Ranjana Shristava)

Proff. & Head Proff. & Head Proff. & Head

Govt. D.B. Girls PG College Govt. N PG Science College Govt. VYTPG Science College

Raipur, (C.G.) Raipur, (C.G.) Raipur, (C.G.)

(Mrs. Sanchal Moghe) (Mr. Shivakant Mishra) (Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

13.6.19 13/6/19 13:6.19 13.6.19

B.Sc.-II (BOTANY) PAPER-II

(ECOLOGY AND PLANT PHYSIOLOGY)

UNIT-I

Introduction and scope of ecology, environmental and ecological factors, Soil formation and soil profile, Liebig's law of minimum, Shelford's law of tolerance, morphological and anatomical adapataions in hydrophytes, xerophytes and epiphytes.

UNIT-II

Population and community characteristics, Raunkiaer's life forms, population interactions (e.g. Symbiosis, Amensalism etc.), succession, ecotone and edge effect, ecological niches, ecotypes, ecads, keystone species

Concept of ecosystem, trophic levels, flow of energy in ecosystem, food chain and food web, concept of ecological pyramids

Biogeochemical cycles:carbon cycle, nitrogen cycle and phosphorus cycle

UNIT-III

Plant water relations: Diffusion, permeability, osmosis, imbibitions, plasmolysis, osmotic potential and water potential, Types of soil water, water holding capacity, wilting, Absorption of water, theories of Ascent of sap, Mineral nutrition and absorption, Deficiency symptoms, Transpiration, stomatal movement, significance of transpiration, Factors affecting transpiration, guttation.

UNIT-IV

Photosynthesis: Photosynthetic apparatus and pigments, light reaction mechanism of ATP synthesis. C3, C4 CAM pathway of carbon reduction, photorespiration, factors affecting photosynthesis.

Respiration: Aerobic and anaerobic respiration, Glycolysis, Kreb's cycle, factors affecting respiration, R.Q.

UNIT-V

Plant growth hormones: Auxin, Gibberellin, Cytokinin, Ethylene and Abscissic acid. Physiology of flowering, Florigen concept, Photoperiodism and Vernalization. Seed dormancy and germination, plant movement.

Books Recommended:

Koromondy, EJ. ***Concepts of Ecology,*** Prentice Hall, USA

13.6.19 13/6/19 13.6.19 13.6.19

Singh, JS Singh SP and Gupta SR. ***Ecology and Environmental Science and Conservation***, S. Chand Publishing, New Delhi

Sharma, PD. ***Ecology and Environment,*** Rastogi Publications, Merrut

Hopkins, WG and Huner, PA. ***Introduction to Plant Physiology,*** John Wiley and Sons.

Pandey SN and Sinha BK, ***Plant Physiology,*** Vikas Publishing, New Delhi

Taiz, L and Zeiger. E. ***Plant Physiology,*** 5th edition, Sinauer Associates Inc. M.A, USA

Srivastava, HS ***Plant Physiology and Biotechnology***, Rastogi Publications, Meerut

B.Sc. II (BOTANY)

Practical

1. Taxonomy: Detailed description and identification of locally available plants of the families as prescribed in the theory paper.
2. Economic Botany: Identification and comment on the plants and plant products belonging to different economic use categories
3. Preparation of Herbarium of local wild plants.
4. Quantitative vegetation analysis of a grassland ecosystem.
5. Anatomical characteristics of hydrophytes and xerophytes.
6. Demonstration of root pressure.
7. Demonstration of transpiration.
8. Demonstration of evolution of O_2 in photosynthesis, factors affecting of photosynthesis.
9. Comparison of R.Q. of different respiratory substrates.
10. Demonstration of fermentation.
11. Determination of BOD of a water body.
12. Demonstration of mitosis.

PRACTICAL SCHEME

TIME: 4 Hrs. **M.M. : 50**

1.	Anatomy	08
2.	Economic Botany	04
3.	Physiology	08
4.	Ecology	10
5.	Spotting	10
6.	Viva-Voce	05
7.	Project Work/ Field Study	10

(Dr. J.N. Verma
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Govt. N PG Science College
Raipur, (C.G.)

(Dr.Ranjana Shristava)
Proff. & Head
Govt. VYTPG Science College
Raipur, (C.G.)

(Mrs. Sanchal Moghe)

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

Govt. Bilasa Girls College, Bilaspur

13.6.19

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Hemchand Yadav Vishwavidyala, Durg (C.G.)
Zoology
B.Sc. Part – II (2019-20)
Paper – I
(Anatomy and Physiology)

Comparative Anatomy of various organ systems of vertebrates:

Unit: I

- Integument and its derivatives: structure of scales, hair and feathers
- Alimentary canal and digestive glands in vertebrates
- Respiratory organs : Gills and lung , air-sac in birds

Unit: II

- Endoskeleton: (a) Axial Skeleton- Skull and Vertebrae, (b) Appendicular Skeleton Limbs and girdles
- Circulatory System: Evolution of heart and aortic arches
- Urinogenital System: Kidney and excretory ducts

Unit: III

- Nervous System: General plan of brain and spinal cord
- Ear and Eye: structure and function
- Gonads and genital ducts

Unit: IV

- Digestion and absorption of dietary components
- Physiology of heart, cardiac cycle and ECG
- Blood Coagulation
- Respiration: mechanism and control of breathing

Unit: V

- Excretion: Physiology of excretion, osmoregulation
- Physiology of muscle contraction
- Physiology of nerve impulse, Synaptic transmission

14.6.19

14.06.19

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Zoology
B.Sc. Part – II (2019-20)

Paper-II

VERTEBRATE ENDOCRINOLOGY, REPRODUCTIVE BIOLOGY BEHAVIOUR, EVOLUTION AND APPLIED ZOOLOGY

Unit: I

- Structure and function of Endocrine glands
- Hormone receptor
- Biosynthesis and secretion of thyroid, adrenal, ovarian and testicular hormones
- Endocrine disorder of pituitary, thyroid, adrenal and pancreas

Unit:II

- Reproductive cycle in vertebrates
- Menstruation, lactation and pregnancy
- Mechanism of parturition
- Hormonal regulation of gametogenesis

Unit: III

- Evidences of organic evolution.
- Theories of organic evolution.
- Variation, Mutation, Isolation and Natural selection.
- Evolution of Horse

Unit:IV

- Introduction to Ethology: Branches and concept of ethology.
- Patterns of Behaviour, Taxes, Reflexes, Drives and Stereotyped behaviour.
- Reproductive behavioural patterns.
- Drugs and behavior, Hormones and behaviour

Unit:V

- Prawn Culture
- Sericulture
- Apiculture
- Pisciculture
- Poultry keeping
- Elements of Pest Control: Chemical & Biological Control

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Zoology
B.Sc. Part II (2019-20)
Practical

The practical work in general shall be based on the syllabus prescribed and the students will be required to show the knowledge of the following:

- Study of the representative examples of the different chordates (Classified characters).
- Dissection of various systems of scoliodon-Afferent and Efferent branchial cranial nerves, internal ear.

Alternative methods: By Clay/Thermacol/ Drawing/ Model etc.)

- Simple microscopic technique through unstained or stained permanent mount.
- Study of prepared slides histological, as per theory papers.
- Study of limb girdles and vertebrae of Frog, Varanus, Fowl and Rabbit.
- Identification of species and individual of honey bee.
- Life cycle of honey bee and silkworm.
- Exercise based on Evolution and Animal behavior.

Scheme of Practical Exam **Time: 3:30hrs**

• Major dissection (Cranial nerves/efferent branchial vessel)	10
• Exercise based on evolution	05
• Exercise based on applied zoology	05
• Exercise based on animal behavior	04
• Spotting-8 (slides-4,bones-2,specimen-2)	16
• Viva	05
• Sessional marks.	05

14.6.19 14.06.19 14.6.19.

MICROBIOLOGY

BSc-2nd

Paper- I: Molecular Biology and Genetic Engineering

UNIT-1: FUNDAMENTALS OF MOLECULAR BIOLOGY

History and scope of molecular biology, concept and mechanism of heredity. DNA as genetic material- experimental evidences. DNA replication- mechanism, process and enzymes/proteins involved in replication.

UNIT-2: CENTRAL DOGMA OF PROTEIN SYNTHESIS

Transcription- initiation, elongation, termination, RNA polymerases and sigma factor. Transcription inhibitors (antibiotics, drugs). Translation- initiation, elongation and termination. Factors involved in translation. Genetic code.

UNIT-3: MUTATION AND DNA REPAIR MECHANISM

Introduction and Types of Gene mutations- Base substitution, frame shift mutation (insertion, deletion, miss-sense, nonsense mutation.) mutagens – physical and chemical. Reverse mutation in bacteria. DNA repair mechanism (mismatch repair, photo-reactivation, excision and SOS repair). Beneficial and harmful effect of mutation.

UNIT-4: GENE REGULATION

Concept of gene- Cistron, Recon, Muton. Operon Concept- lac Operon, tryptophan Operon, His Operon. Activator, Co-activator and Repressor. Introduction to Bioinformatics- Elementary genome Database.

UNIT-5: GENETIC ENGINEERING

Basic concept of Genetic Engineering, DNA modifying enzymes Restriction endonuclease, DNA ligase, terminal transferase. Vectors- pBR322, pUC19, BAC and YAC. Phage based vectors, expression of vector. Transformation – physical and chemical method. Bacterial Host. Screening of recombinant vector Blue white Screening, Colony Hybridization.

Text Books Recommended:

1. Gene Cloning by T.A. Brown.
2. General Microbiology by Power and Daganiwala.
3. Zinssers Microbiology by KJ Wolfgang, McGraw- HJill Company.
4. Microbial Genetics by RM Stanley, F David and EC John.
5. Bacteriological Techniques by FJ Baker.
6. .Molecular Biology of the Cell; *3rd Edition;* Bruce Alberts ,et.al; Garland Publishing.
7. Cell biology; C.B. Powar; Himalaya Publishing House; Fifth edition
8. Cell & Molecular Biology; Gerald Karp; Fourth edition
9. A Textbook of Microbiology; Dubey&Maheshwari; S.chand& Sons.
10. Cell biology & Genetics; P. K. Gupta
11. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

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Paper- II: Bioinstrumentation and Biostatistics

UNIT-1: MICROSCOPY AND CENTRIFUGATION

Simple and compound light microscope, Bright field, Dark field, Phase contrast and Electron microscope. Centrifugation- principle and types of centrifuges (analytical and preparatory), types of centrifugation- differential and rate zonal centrifugation.

UNIT-2: pH metry and chromatography

Principle of pH meter, types of electrodes, factors affecting pH measurements, and application of pH meter. Chromatography- principle, types- paper, TLC and column chromatography, HPLC.

UNIT-3: SPECTROPHOTOMETRY

Electromagnetic spectrum, Beers-Lamberts law, Types (Principles, working and application)- colorimeter, UV - Vis Spectrophotometry and IR- Spectrophotometry, Turbidometry.

UNIT-4: Electrophoresis and X-Ray Diffraction

Principle of electrophoresis, instrumentation and Application, types of Paper, Gel electrophoresis and Immunoelectrophoresis. X-ray diffraction- principle and application.

UNIT-5: Biostatistics

Data- Types, characteristics, presentation and distribution. Data analysis- central tendency (Mean, Median and Mode), Deviation (variance SD and SE). Concept of probability.

Text Books Recommended:

1. Introduction to Istrumental analysis by Robert Braun.
2. Instrumental Techniques by Upadhyay and Upadhyay.
3. Instrumental Methods of Chemical Analysis by BK Sharma.
4. Bio statistics; Sunder Rao
5. Statistical Methods; S. P. Gupta; Sultan Chand & Sons

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PRACTICAL

M. M. 50

Determination of antibiotic resistance by plating method.
Assaying of microbial enzymes; Catalase, Proteases, Peroxidases, Cellulase, Cellobioases, Amylase, Diastase.
Exercise on paper, thin layer, column chromatography.
Exercise on paper and gel electrophoresis.
determination of pH of various water and soil sample.
testing of lambert beer's law.
Determination of lamda max of dye by spectrophotometer
Isolation of resistant bacteria from soil and water sample

Scheme of Practical Examination

Time - 4 hours M.M. 50

1. Exercise on spectrophotometer/ pH meter	10
2. Exercise on chromatography	10
3. Exercise on genetics	05
4. Spotting (1-5)	10
5. Viva-Voce	05
6. Sessional	10
	Total 50

15/6/19 18/6/19 15/6/19 15/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Scheme of Examination

कक्षा	प्रश्नपत्र	विषय समूह	सैद्धा. अंक	प्रायो. अंक	योग
BSc. I year	I	भूगतिकी एवं भू–आकृति विज्ञान (Geodynamics & Geomorphology)	50	50	150
	II	खनिज एवं क्रिस्टल विज्ञान (Mineralogy & Crystallography)	50		
BSc. II year	I	शैलिकी (Petrology)	50	50	150
	II	संरचनात्मक भूविज्ञान (Structural Geology)	50		
BSc. III year	I	जीवाश्म विज्ञान एवं संस्तर विज्ञान (Palaeontology & Stratigraphy)	50	50	150
	II	भूसंसाधन एवं व्यावहारिक भूविज्ञान (Earth Resources & Applied Geology)	50		

-: Note :-

प्रत्येक वर्ष के विद्यार्थियों हेतु पाठ्यक्रम में उल्लेखित भूवैज्ञानिक क्षेत्रीय अध्ययन अनिवार्य होगा।

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कक्षा / Class- B.Sc-II

Paper –I

शैलिकी

(PETROLOGY)

इकाई–01

(i) मैग्मा; परिभाषा, उत्पत्ति एवं संगठन

(ii) बॉवेन की अभिक्रिया श्रेणी, मैग्मीय विभेदन एवं स्वांगीकरण

(iii) तंत्र, प्रावस्था एवं घटक, उष्मागतिकी के सिद्धांत, एकघटकीय (सिलिका) द्विघटकीय ऐल्बाईट–एनॉर्थाइट तथा डायोप्साइड–एनॉर्थाइट एवं त्रिघटकीय सिलिकेट सिस्टम डायोप्साइड–एल्बाइट–एनॉर्थाइट क्रिस्टलीकरण, प्रावस्था संतुलन

(iv) आग्नेय शैलों का गठन, संरचनायें एवं वर्गीकरण

(v) आग्नेय शैलों का रूप

इकाई–02

(i) दिक्काल में शैल–संलग्नता, शैल–ग्रंथियों की अवधारणा

(ii) अम्लीय आग्नेय शैलों का शिला विवरणात्मक अध्ययन

(iii) क्षारीय आग्नेय शैलों का शिला–विवरणात्मक अध्ययन

(iv) अल्पसिलिक आग्नेय शैलों का शिलाविवरणात्मक अध्ययन

(v) अत्यल्पसिलिक आग्नेय शैलों का शिलाविवरणात्मक अध्ययन

इकाई–03

(i) अवसाद की उत्पत्ति, परिवहन एवं निक्षेपण

(ii) अवसाद निक्षेपण की वायूढ़, जलोढ़, तटीय, एवं गंभीर समुद्री वातावरण की गतिकी

(iii) अवसादी संलक्षणाओं की अवधारणा

(iv) डायजिनेसिस की अवधारणा

(v) अवसादी शैलों का गठन एवं संरचनायें

इकाई–04

(i) अवसादी शैलों का वर्गीकरण

(ii) अवसादी शैलों की शैलिकी : रूडेशियस, एरेनेशियस, केल्केरियस अवसादी शैल

(iii) कायान्तरणः परिभाषा एवं कारक, संलक्षणा, कायान्तरण श्रेणी

(iv) कायान्तरित शैलों का गठन, संरचना एवं वर्गीकरण

(v) कायान्तरण प्रक्रियाओं की साम्य एवं असाम्य अभिक्रियायें

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इकाई–05 (i) पैराजिनेटिक–आरेखः प्रक्षेपीय विश्लेषण, ए.सी.एफ. एवं ए.के.एफ. आरेख

(ii) मृण्मय अवसादों का प्रगामी कायान्तरण

(iii) अशुद्ध चूना पत्थरों का प्रगामी–उष्मागतिक कायान्तरण

(iv) अल्प सिलिक शैलों का प्रगामी उष्मागतिक कायान्तरण

(v) भारत का शैलिकीय–प्रादेशिक विभाजन

प्रायोगिक कार्य–

(1) आग्नेय, अवसादी एवं कायान्तरित शैलों के विभिन्न रूपों एवं संरचनाओं को रेखाचित्र की सहायता से प्रदर्शित करना।

(2) विभिन्न आग्नेय शैलों का स्थूलदर्शी अध्ययन एवं सूक्ष्मदर्शी अध्ययन

(3) विभिन्न अवसादी शैलों का स्थूलदर्शी एवं सूक्ष्मदर्शी अध्ययन

(4) विभिन्न कायान्तरित शैलों का स्थूलदर्शी एवं सूक्ष्मदर्शी अध्ययन

(5) भारत के शैलिकीय प्रदेशों का मानचित्र में प्रदर्शन

(6) नार्म कैलकुलेशन

Suggested Readings:-

(1) शैलिकी के सिद्धान्त – डॉ. अंबिका प्रसाद अग्रवाल

(2) शैलिकी के सिद्धान्त – ए. जी. झिंगरन

(3) Principles of petrology - G.W. Tyrell

(4) Petrology - H.William, F.J. Turner & E.M. Gilbert

(5) Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee

(6) A text book of sedimentary petrology - Verma & Prasad

(7) Metamorphism & Metamorphic rocks of India- S. Ray

(8) Sedimentary rocks - F.J. Pettijohn

(9) Introduction of sedimentology - S.Sengupta

(10) Sedimentary Environment - H.G. Readings

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Class- B. Sc. -II

Paper –I

(PETROLOGY)

Unit:1	(i)	Magma, definition, origin & composition
	(ii)	Bowen's reaction series, magmatic differentiation & assimilation
	(iii)	System, phases & component, principles of thermodynamics, Crystallisation and phase equilibrium of unicomponent magma:(Silica), Bi-component magma: Albite-Anorthite and Diposide-Anorthite Tri-component magma: Diopside-Albite-Anorthite
	(iv)	Textures, structures & classification of igneous rocks
	(v)	Forms of igneous rocks
Unit:2	(i)	Rock association in Time & Space, concepts of rock kindreds
	(ii)	Petrographic studies of Acid igneous rocks.
	(iii)	Petrographic studies of Alkaline igneous rocks
	(iv)	Petrographic studies of Basic igneous rock
	(v)	Petrographic studies of Ultrabasic igneous rocks.
Unit:3	(i)	Origin, transportation & deposition of sediments
	(ii)	Dynamics of sedimentary depositional environment; Aeolian, fluvial, coastal and abyssal environment.
	(iii)	Concept of sedimentary facies
	(iv)	Concept of diagenesis
	(v)	Textures & structures of sedimentary rocks.
Unit:4	(i)	Classification of sedimentary rocks.
	(ii)	Petrography of sedimentary rock; rudaceous, arenaceous, calcareous sedimentary rocks.
	(iii)	Metamorphism; definition, agents, facies & grade
	(iv)	Textures, structures & classification of metamorphic rocks.
	(v)	Equilibrium & non-equilibrium reactions in metamorphism.
Unit:5	(i)	Paragenetic diagrams; projective analysis A.C.F & A.K.F. diagrams
	(ii)	Progressive metamorphism of Argillaceous rocks.
	(iii)	Progressive dynamo-thermal metamorphism of impure limestone.
	(iv)	Progressive dynamo-thermal metamorphism of basic igneous rocks.
	(v)	Petrographic provinces of India.

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Practical:

(1) Diagrammatic representation of various forms & structures of igneous, sedimentary & Metamorphic rocks

(2) Megascopic studies of various sedimentary, metamorphic & igneous rocks.

(3) Microscopic studies of various sedimentary, metamorphic & igneous rocks.

(4) Norm calculation

(5) Diagrammatic representation of petrographic provinces of India in outline map of India.

Suggested Readings:-

(1) शैलिकी के सिद्धान्त – डॉ. अंबिका प्रसाद अग्रवाल

(2) शैलिकी के सिद्धान्त – ए. जी. झिंगरन

(3) Principles of petrology - G.W. Tyrell

(4) Petrology - H.William, F.J. Turner & E.M. Gilbert

(5) Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee

(6) A text book of sedimentary petrology - Verma & Prasad

(7) Metamorphism & Metamorphic rocks of India- S.Ray

(8) Sedimentary rocks - F.J. Pettijohn

(9) Introduction of sedimentology - S.Sengupta

(10) Sedimentary environment - H.G. Readings

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कक्षा / Class- B.Sc-II

Paper –II

संरचनात्मक भू–विज्ञान

(STRUCTURAL GEOLOGY)

इकाई–01	(1)	संरचनात्मक भूविज्ञान की परिभाषा एवं अध्ययन क्षेत्र।
	(2)	शैल दृष्यांशों का अध्ययन। दृष्यांशों पर नति तथा ढाल के प्रभाव।
	(3)	संस्तरण की पहचान। नति एवं नतिलम्ब की माप।
	(4)	क्लाइनोमीटर एवं ब्रन्टन कम्पास।
	(5)	संस्तरों के शीर्ष तथा तल की पहचान।
	(6)	शैलविरूपण की अवधारणा। प्रतिबल तथा विकृति दीर्घवृत्तज की अवधारणा।
इकाई–02	(1)	वलन की आकारिकी।
	(2)	वलन की ज्यामितिक एवं जननिक वर्गीकरण।
	(3)	स्थलीय तथा भूवैज्ञानिक मानचित्र में वलन की पहचान।
	(4)	दृश्यांशों पर वलन के प्रभाव।
	(5)	वलन क्रियाविधि की प्राथमिक अवधारणा।
इकाई–03	(1)	भ्रंश आकारिकी। सर्पण और सेपरेशन।
	(2)	भ्रंश का ज्यामितिक एवं जननिक वर्गीकरण।
	(3)	स्थलक्षेत्र तथा भूवैज्ञानिक मानचित्र में भ्रंश की पहचान।
	(4)	दृश्यांशों पर भ्रंश के प्रभाव।
	(5)	भ्रंशन क्रियाविधि की प्राथमिक अवधारणा।
इकाई–04	(1)	संधि; आकारिकी, संधि का ज्यामितिक एवं जननिक वर्गीकरण।
	(2)	पत्रण की परिभाषिक शब्दावली, प्रकार, उत्पत्ति एवं विशाल संरचनाओं से संबंध।
	(3)	रेखण की परिभाषिक शब्दावली, प्रकार, उत्पत्ति एवं विशाल संरचनाओं से संबंध।
	(4)	लवण गुम्बद,
	(5)	प्लूटान; विवर्तनिकी एवं अभिस्थापन
इकाई–05	(1)	विषमविन्यास के प्रकार एवं पहचान।
	(2)	पुरान्तशायी एवं नवान्तशायी, अतिव्यापन तथा अपव्यापन।
	(3)	विवर्तनिकी की अवधारणा।
	(4)	प्रायद्वीपीय, सिंधु गंगा के मैदान तथा प्रायद्वीपेत्तर भारत का विवर्तनिकी विन्यास।
	(5)	त्रिविमीय प्रक्षेपण का संरचनात्मक भूविज्ञान में अनुप्रयोग।

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प्रायोगिक कार्य–

(1) प्राकृतिक संरचनात्मक प्रादर्शों का अध्ययन।

(2) विभिन्न संरचनाओं का प्रादर्शों के माध्यम से अध्ययन।

(3) मानचित्र में दृश्यांश को पूरा करना।

(4) सरल से जटिल संरचनाओं को प्रदर्शित करने वाले मानचित्रों से भूवैज्ञानिक काट बनाना एवं भूवैज्ञानिक इतिहास की विवेचना करना।

(5) संरचनात्मक भूविज्ञान में स्टिरियोग्राफिक प्रोजेक्शन का अनुप्रयोग।

(6) सात दिवसीय भूवैज्ञानिक क्षेत्रीय अध्ययन।

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Class- B.Sc - II
Paper –II
(STRUCTURAL GEOLOGY)

Unit:1
(i) Definition and scope of Structural Geology. Study of outcrops. Effects of dip and slope on outcrops.
(ii) Identification of bedding. Dip and strike measurement.
(iii) Clinometer and Brunton compass.
(iv) Recognition of top and bottom of beds.
(v) Concept of rock deformation. Concept of stress and strain ellipsoids.

Unit:2
(i) Fold morphology.
(ii) Geometric and genetic classification of folds.
(iii) Recognition of folds in the field and on geological maps.
(iv) Effect of folds on outcrops.
(v) Elementary idea of mechanics of folding.

Unit:3
(i) Fault morphology. Slip and separation.
(ii) Geometric and genetic classification of faults.
(iii) Recognition of faults in the field and on geological maps.
(iv) Effect of faults on outcrops.
(vi) Elementary idea of mechanics of faulting.

Unit:4
(i) Joint morphology; geometric and genetic classification of joints.
(ii) Foliation; terminology, kinds, origin and relation to major structures.
(iii) Lineation: terminology, kinds, origin and relation to major structures.
(iv) Salt domes.
(vii) Plutons; tectonics & emplacement.

Unit:5
(i) Types and recognition of Unconformity.
(ii) Outlier and inlier. Overlap & offlap.
(iii) Concept of tectonics.
(iv) Tectonic framework of Peninsula, Indo-Gangetic Plains and Extra-Peninsular India.
(v) Stereographic projection & it use in Structural Geology.

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Practical-

(1) Study of Natural Structures in hand specimens.

(2) Study of structures with the help of models.

(3) Completion of outcrops.

(4) Preparation of geological section from simple to complex geological maps and its interpretation.

(5) Application of stereographic projection in structural geology.

(6) Geological excursion for seven days.

Books recommended:

(1) संरचनात्मक भूविज्ञान – डॉ.डी.के. श्रीवास्तव

(2) भूवैज्ञानिक संरचनाएँ – डॉ. भरत सिंह राठौर

(3) प्रायोगिक भूविज्ञान (भाग–2) – आर.पी. मांजरेकर

(4) Structural Geology : M.P. Billings.

(5) Theory of Structural Geology : Gokhale, N.W.

(6) Exercises on Geological maps and dip-Strike: Gokhale, N.W.

(7) Outlines of structural Geology: E.S. Hills.

(8) Structural Geology : Hobbs, Means and Williams.

(9) Geological maps : Chiplonkar and Pawar.

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B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject	:-	Anthropology
Paper	: -	First
Name of the Paper	:-	ARCHAEOLOGICAL ANTHROPOLOGY

Total Marks : 50 Pass Marks : 17

Syllabus

UNIT – I Meaning and scope of Archaeological Anthropology, branches of Archaeology: Classical Archaeology, Historical Archaeology, Prehistoric Archaeology and Protohistoric Archaeology. Anthropology as Archaeology. Differences between the Old world and new world Archaeological Traditions. Absolute and Relative Dating.

UNIT – II Geological time scale. The Great Ice Age
Stratigraphy and other evidences of Ice Age: River terraces. Moraines etc. Pluvial and interpluvials
Stone Age tools: Types and Technology.

UNIT – III Age of Paleolithic savagery:
European lower Paleolithic period: Stone tools and cultures
Indian lower Paleolithic period: Sohan Culture & Madrasian Culture.
European Middle Paleolithic Period: Tools & culture; Flake took complex in India
European Upper Paleolithic period; Tools and Culture, main characteristics of the European Paleolithic Home and Cave art and its significance.

UNIT – IV Mesolithic complex in North Europe. Mesolithic complex in Western Europe, Mesolithic Culture in India. Chief feature of Neolithic revolution. Neolithic complex in India.

UNIT – V Metal Age: Copper, Bronze and Iron Age
Urban revolution: General Features
Indus valley civilization: Main Features, Town Planning, Economic activities, origin and decay

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B.A. /B.Sc. – Second Year
Session: 2019-20

Name of the Subject :- Anthropology
Paper : - Second
Name of the Paper :- TRIBAL CULTURE OF INDIA
Total Marks : 50 Pass Marks : 17

Syllabus

UNIT-I

Define tribe and scheduled tribe. Geographical distribution of Indian tribes and their racial and linguistic classification. Contribution of Anthropology in the study of Indian tribes.

Sacred complex, Universalisation and parochialisation, Sanskritisation, westernization, dominant caste.

Tribes and caste, Difference between S.C. and S.T.

Particularly Vulnerable Trible Group (PVTG) of Chhattisgarh (Kamar, Birhor, Hill Korwa. Abujhmariya, Baiga)

UNIT-II

Primitive economy:-

Stages of tribal economy: Hunting, food gathering, fishing, shifting and settled agriculture.

Concept of Property and ownership in tribal societies

Problems of tribal people: land alienation, bonded labour, indebtedness, shifting cultivation, irrigation, Unemployment, agricultural labour; Forest and Tribals

New economic anthropology: Exchange- Gifts, barter, trade, ceremonial exchange and market economy

UNIT-III

The problems of culture contact: Problems due to urbanization and industrialization, Regionalism

Tribal religion: origin & function, animism, totemism.

Concept and practices of Magic and witchcraft, shamanism, head hunting.

UNIT-IV

Political organisation of Indian tribes: Distinction between state and stateless society, law in primitive society

Social organization of Indian Tribes: Matriarchal and patriarchal family,. Lineage and clan, Ways of acquiring mates in tribal societies.

Youth dormitories: Type, organisation and functions.

UNIT-V

Tribal development: History of tribal development, the constitutional safeguards for the scheduled tribes.

Tribal problem: isolation, migration, acculturation, detribalization.

Policies, plans and programmes of tribal development and their implementation. Tribal revolts in India.

Contributions of anthropology to tribal development.

Response of the tribal people for development programs of government and NGO

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Recommended Readings:

1. Chaudhary, Bhudadeb (Ed.). Tribal Development in India.
2. Elwin,V.A. Philosophy for NEFA.
3. Haimendorf. The Tribes of India: Struggle for survival.
4. Shara B.D. Basic Issues in tribal Development.

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B.A./B.Sc. – Second Year

Session : 2019-20

Name of the Subject :- Anthropology

Paper : - Practical

Name of the Paper :- MATERIAL CULTURE AND RESEARCH TOOLS

Total Marks : 50 Pass Marks : 17

OBJECTIVES :

The objective of this practical course is to introduce the student with the primitive material culture and technology used by primitive man and the student will be introduced with various techniques commonly used by social Anthropology.

MATERIAL CULTURE :

Part – I. Identification and technological descriptions of the following.

1. Implements for food gathering, hunting, fishing and agriculture
2. Fire making implements
3. Types of habitations
4. Land and water transport

Part-II Sketching, identification and the description of Paleolithic, Mesolithic and Neolithic tools

(It is essential that students should draw at least five tools of each age)

Part- III Construction of schedule, Geneology and Questionnaire

Each student should collect information through above tools from 10 Respondents.

The Student will be required to maintain practical records of all work done in the practical class.

20/06/19

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
Syllabus for B.A. / B.Sc. Course, 2019-20
Subject: Statistics

Each year of B.A. /B.Sc. I, II, III shall have two theories and one practical course. All the Theory as well as Practical Examinations will be of 3 hours duration. In each practical examination 10% marks shall be fixed for viva –voce and 20% marks for practical record.

Scheme of Examination

	Title of the paper	MAX. Marks
B.A./B.Sc. I	**Paper-I** (Code No. 0803**): Probability I** **Paper-II** (Code No. 0804**): Descriptive Statistics I** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. II	**Paper-I** (Code No. 0853**): Statistical Methods** **Paper-II** (Code No. 0854**): Sampling Theory and Design of Experiments** **Paper III**: **Practical**- Based on Theory Papers I & II	50 50 50
	Total	**150**
B.A./B.Sc. III	**Paper I** (Code No. 0907**): Applied Statistics** **Paper II** (Code No. 0908): **Statistical Quality Control and Computational Techniques** **Paper III: Practical-** Based on Theory Papers I & II	50 50 50
	Total	**150**

B.A./B.Sc. –II
Subject: Statistics
Paper-I(Paper Code-0853)
Statistical Methods

Unit I

Sampling from a distribution: Definition of a random sample, simulating random sample from standard distributions (uniform, Normal, Exponential), concept of derived distributions of a functions of random variables, concept of a statistics and its sampling distribution. Point estimate of a parameter. Properties of a good estimator, Concept of bias and standard error of an estimate .Standard errors of sample mean, sample proportion. **S**ampling distribution of sum of Binomial, Poisson and mean of Normal distributions. Independence of sample mean and variance in random sampling from a Normal distribution (without derivation).

Unit II

Statistical tests and interval estimation: Null and alternative hypothesis. Types of errors, level of significance, p values, one and two tailed tests, Procedure for testing of hypothesis. Statement of chi-squares, Student's t and F statistics. Testing for the single mean and variance of a univariate normal distribution, testing the equality of two means and testing for the equality of two variances of two univariate normal distributions. Related confidence intervals. Testing for the significance of sample correlation in sampling from bi-variate normal distribution and for equality of means and equality of variances in sampling from bivariate normal populations.

Unit III

Large sample tests: use of central limit theorem for testing and interval estimation of a single mean and a single proportion and difference of two means and two proportions, Fisher's Z transformation and its uses. Pearson's chi-square test for goodness of fit and for homogeneity for standard distributions. Contingency table and test of independence in a contingency table.

Unit IV

Nonparametric tests: Definition of order statistics and their distributions, Non-parametric tests, Sign test for univariate and bivarite distributions, Wilcoxon test, Mann-Whitney test, Run test, median test and Spearman's rank correlation test.

Unit V

Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Frund J.E. (2001) Mathematical Statistics, Prentice Hall of India.
2. Goon A.M., Gupta M.K., Das Gupta.B. (1991): Fundamentals of Statistics, Vol.I, World Press, Culcutta.
3. Gupta and Kapoor: Fundamentals of Mathematical Statistics S.Chand & Sons.
4. Hodges, J.L. and Lehman E.L. (1964): Basic Concepts of Probability and Statistics, Holden Day.
5. Mood A.M, Graybill F.A and Boes D.C. (1974): Introduction to the Theory of Statistics, McGraw Hill.

ADDITIONAL REFERENCES

1..Bhat B.R., Shrivenkatramana T and Rao Madhava K.S. (1997): A Beginner's Text, Vol. II, New age International (P) Ltd.

2. Rohatgi, V.K. (1967): An Introduction to Probability Theory and Mathematical Statistics, John Wiley & Sons.

3. Snedecor, G.W. and Cochran W.G. (1967): Statistical Methods. Lowa State University Press.

Paper-II (Paper Code-0854)
Sampling Theory and Design of Experiments

Unit I
Concepts of population and sample, need for sampling ,Census and sample survey , Basic concepts in sampling , organizational aspects of survey sampling, sample selection and sample size .
Some basic sampling methods – simple random sampling (SRS) with and without replacement.

Unit II
Stratified random sampling , Systematic sampling , Allocation problems, ratio and regression methods of estimation under SRS.
Non-sampling errors, aquitance of working (questionnaires, sampling design, methods followed in field investigation, principal findings, etc) of NSSO and other agencies undertaking sample surveys.

Unit III
Analysis of variance for one way and two-way classifications. Need for design of experiments, fundamental principal of design, basic designs- CRD, RBD, LSD and their analysis.

Unit IV
Missing plot technique. Analysis of co-variance. Factorial experiments : 2^2, 2^3 factorial experiments, illustrations, main effects and interactions, confounding and illustrations. Yates method of finding treatment totals.

Unit V
Four short notes, one from each unit will be asked. Students have to answer any two.

REFERENCES

1. Cocran W.G. (1977): Sampling Techniques, John Wiley and Sons.
2.Des Raj (2000): Sample Survey Theory, Narosa Publishing House.
3.Murthy M.N(1967): Sampling Theory and Methods, Statistical Publishing Society, Calcutta.
4.Singh, D. and Chaudhary,F.S. (1986): Theory and analysis of Sample Survey Designs. New Age International Publisher.
5.Sukhatme P.V., Sukhatme B.V., Sukhatme S. and Ashok C.(1984), : Sample Survey Methods and Its Applications, Indian Society of Agricultural Statistics, New Delhi.
6. Das M.N. and Giri (1986) : Design and analysis of experiments,springer verlag.
7.Goon A.M.,Gupta M.K.,Das Gupta B. (1986): Fundamentals of Statistics, Vol.II, World Press, Culcutta.
8. Joshi,D.D.(1987):Linear Estimation and Design of Experiments,Wiley Eastern.
9. Kempthorne O.(1965) : The Design and Analysis of Experiments,Wiley Eastern.

Paper III:

Practical : Practicals Based on Paper I & II

1. drawing random samples from standard univariate discrete and continuous distributions such as Binomial, Poission, Normal, Cauichy and Exponential.
2. Tests of significance based on Student's t, Chi-square, F. Test of significance of sample correlation coefficient. Use of Z Transformation.Testing of equality of means and equality of variance in sampling from bivariate normal.
3. Large sample tests for means and proportions, tests of goodness of fit and independence of attributes in contingency tables.
4. Nonparametric tests: Sign, Run, Median, Wilcoxon, Mann-Whitney tests.
5. Selection of samples and determination of sample size. Simple random sampling, Statified and systematic sampling. Allocation problem in stratified sampling. Ratio and regression methods of estimation.
6. Analysis of variance for one way and two way classifications. Analysis of CRD, RBD and LSD. Analysis of 2^2 and 2^3 experiments.

DEFENCE - STUDIES

PAPER - I

WESTERN MILITARY HISTORY

(Paper Code - 0867)

Note : The aim of this paper is to give a historical, political & social back ground of the state engaged in the conflicts under study and the factors influencing the development of different forms of warfare and weapons system.

Note : Question will be set from each unit there will be only Internal choice.

UNIT-I
1. Sunt Zu - Founderof MilitaryTheory and philosophy.
2. Clausewitz - War and its relationship with politics.
3. Macheavelli - Renaissance of Art of war.
4. Jomini- Concept of mass armies.

UNIT-II
1. Churchil.
2. MahatmaGandhi.
3. Kautilya.
4. A.Hitler.

UNIT-III
1. Mao TseTung.
2. CheGuevara.
3. Economic and Psychologicalwar.
4. CollectiveSecurity.

UNIT-IV
1. Indo-China War -1962 Causes of war, political&military lesson.
2. Indo - PakWar -1965 Causes of war, political &military lesson.
3. Indo - PakWar - 1971 Causes of war, political &military lesson.
4. Kargil Conflict1999.

UNIT-V
1. Internal & External threats of NationalSecurity.
2. Insurgency andCounter-Insurgency.
3. Terrorism-Problem andSolution.
4. Naxalism - Problem and solution.

REFRENCE BOOKS:

1. HowardM. : Theory and Practice of war
2. ---,,--- : Clausewitz
3. Mao TseTung : Guerilla warfare
4. Palit,D.k. : The lightning War Tadit Yudh
5. Mankekar : War of1971
6. आर.सी. जोहरी : पाश्चात्य सैम्य विचारक
7. शर्मा च निगम : सैम्य विचारक।

PRACTICAL

There shall be a practical examination of 3.5 hours duration carrying 50 Marks. The division of marks shall be as follow:

(a)	Exercise based onMap-reading:		15marks
(b)	T.W.E.S.T.	:	15marks
(c)	Sessionalwork	:	10marks
(d)	Viva-Voce	:	10markss

PART - A

Map-reading:

1. Scales - Definition, method of expressing, construction of simple, time, diagonalandcomparative.
2. Relief and itsrepresentation.
3. Slopes andGradient.
4. Visibility and inter-visibility by Gradient, proportionate and section method.
5. Re-section andinter-section.
6. Grid system-Map reference, Indexto map. Four figure and Sixfigure.

PART - B

7. Organizationand equipment of infantry Platoon and Section.
8. SectionFormation.
9. Indication of Target by various methods.
10. Fire controlorder.
11. Patrols.
12. Battle Procedures(ROFT).
13. VerbalOrder.
14. Message-Writing.

BOOKS RECOMMENDED:

1.Manual of MapReading: Landon Her
2. युद्ध स्थल कला : चौ. नरेन्द्र सिंह
3.एन.सी.सी. परिचय : विष्णु कांत शर्मा।

INDUSTRIAL CHEMISTRY

PAPER – I

(Paper Code - 0871)

M.M. 34

UNIT-I Material Science : Mechanical Properties of materials and change with respect to temperature. **02L**

Material of constructions used in Industry :

Metals and Alloys : Important metals & alloys; iron, copper, aluminium lead, nikel, titanium and their alloys- Mechanical and chemical properties and their applications. **06L**

Cement : Types of cement, composition, manufacturing process, setting of cement. **04L**

Ceramics : Introduction, Types, Manufacturing process, Applications. Refractories. **04L**

UNIT-II Polymeric Mateials : Industrial polymer and comoposite materials- Their constitution, Chemical and physical properties, Industrial applications. **06L**

UNIT-III Glass : Types, composition, manufacture, physical and chemical properties, Applications. **04L**

Corrosion : Various types of corrosion relevant to chemical Industry-Machanism, Preventive methods. **04L**

UNIT-IV Pollution : Air, Oxygen, nitrogen cycle, water, Biosphere, flora and fauna, Energy, soil. **05L**

Pollutants and their statutory limits, pollution evaluation methods. **04L**

UNIT-V Air pollution-various pollutants. water pollution-organic/inorganic pollutants, Noise pollution, sewage analysis, pesticide pollution, Radiation pollution, green house effect, future. **10L**

Books Recommended :

1. Pollution control in chemical & Allied Industries, S.P. Mahajan.
2. Poolution Control in Industries, A Sories of Books by Jones, H.P.
3. Air Pollution - Vol.1 to 4, Editor, STERN, A.C.; Academic Press.
4. Environmental Engineering, G.N. Pandey, Tata McGraw Hill.
5. Homd Book of Air Pollution, A. Parker, Tata McGraw Hill.
6. Science of Ceromic chemical Processing, Hench, L.L.
7. Science of Ceramics, Stewarts, G.H.
8. Chemistry of Cement.
9. Properties of Glass, Morcy, G.W.
10. Chemistry of Glasses, Paul, A.
11. Corrosion, causes & Prevention, Spellur, F.N.

PAPER - II
(Paper Code - 0872)

M.M. 33

UNIT-I Unit processes in organic chemicals manufacture -

Nitration : Introduction - Nitrating agents, Kinetics and mechanism of nitration processes such as nitration of :

i Paraffinic hydrocarbons
ii. Benzene to nitrobenzene and m-dinitrobenzene
iii. Chlorobenzene to o and p nitrochloro benzenes.
iv. Acetanilide to p-nitroacentanilide
v. Toluene

Continous vs batch nitration. **12L**

UNIT-II Helogenation: Introduction-Kintics of helogenation reactions reagents for elogenation, Helogenation of aromatics-side chain and nuclear helogenations, commercial manufacture of chlorobenzenes, chloral, monochloracetic acid and chloromethanes, dichloro fluormethane. **09L**

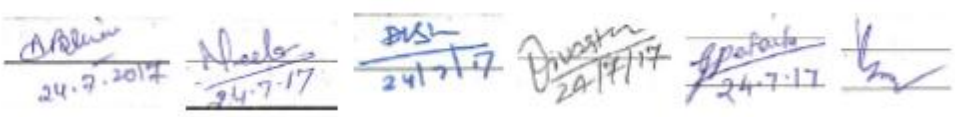
UNIT-III Sulphonation : Introduction-sulphonating agents, chemical and physical factors in sulphonation, Kinetics and mechanism of sulphonation reaction, commercial sulfonation of benzene, naphthalene, alkyl benzene, Batch vs continous sultphonation. **09L**

UNIT-IV Effluent Treatment and waste Management : Principles and equipments for aerobic, anaerobic treatment, adsorption, filtration, sedimentation. **09L**

UNIT-V Bag fillters, electrostatic precipitator, mist eliminators, wet scrubbers, absorbers, solid waste management, industrial safety. **09L**

Books Recommended :

1. Unit process in Organic synthesis P.M. Groggins, McGraw Hill.
2. Effluent Treatment in process Industries - Inst. of Cham. Engg.
3. Effluent Treatment and waste Disposal - Inst. of Chem. Engg.
4. Effluent Treatment and Disposal - Inst. of Chem. Engg.



PAPER - III
(Paper Code - 0873)

M.M. 33

UNIT-I Oxidation : Introduction-Types of oxidation reactions, oxidizing agents, kinetics and mechanism of oxidation of organic compounds liquid phase oxidation, vapor phase oxidation, commercial manufacture of benzoic acid, maleic anhydride, phthalic anhydride, acrolein, acetaldehyde, acetic acid. **07L**

UNIT-II Hydrogenation : Introduction-Kenetics and thermo-dynamics of hydrogenation reactions, catalysts for hydrogenation reactions, hydrogenation of vegetable oil. manufacture of methanol from carbon monoxide and hydrogen, hydrogenation of acids and esters to alcohols, catalytic reforming. **07L**

Alkylation: Introducton; Types of alkylation, Alkylating agents, Thermodynamics and mechanism of alkylation reactions, manufacture of - alkyl benzenes (for detergent manufacture), ethyl benzene, phenyl ethyl alcohol, N-alkyl anilines (mono and di- methyl anilines) **03L**

UNIT-III Esterification : Introduction; Hydrodynamics and kinetics of esterification reactions, Esterification by organic acids, by addition of unsaturated compounds, esterification of carboxy acid derivaives, commercial manufacture of ethyl acetate, dioctyl phthalate, vinyl acetate, cellulose acetate. **04L**

Amination : (A) By reduction : Intoduction, Methods of reduction-metal and acid, catalytic, sulfide, electrolytic, metal and alkali sulfites, metal hydrides, sodium metal, concentrated caustic oxidation, reduction, commercial manufacture of aniline, m-nitroaniline, p-amino phenol.

(B) By aminolysis : Introduction, aminating agents, factors affecting. **09L**

Hydrolysis : Introduction; hydrolysing agents, kinetics, thermodyanics and mechanism of hydrolysis. **02L**

UNIT-IV Procees Instrumentation : concept of measurement and accuracy Principle, construction and working of following measuring instruments.

Temperature : Glass thermometers, bimetallic thermometer pressure spring thermometer, vapour filled thermometers resistance thermometers. radiation pyrometers.

Pressure : Manometers, barometers, bourdon pressure gauge ; bellow type, diaphragm type pressure gauges, macleod gauges, pirani gauges, etc. **12L**

UNIT-V Liquid level : Direct-indirect liquid level measurement, Float type liquid level gauge, ultrasonic level gauges; bubbler system, density mesurement, viscocity measure- ment. **07L**

24.7.2017 24.7.17 24/7/17 24/7/17 24.7.17

Books Recommended :

1. Unit process in organic synthesis, P.M. Groggins, McGraw Hill.
2. Industrial Instrumentation, Bekmen, D.P., John wrleys.
3. Applied Instrumentation in process Industries, Vol. I, II & III, Andrews, W.G., Gulf Publication.
4. Instrumentation and Control for the process Industries, Borer, S. Elsevier Applied Science Publishers.
5. Chemical Enggineer's Hand book, Perry, J.H. and Green, D. McGraw Hill.

Time : 4 Hours **PRACTICALS** **M.M. 50**

Unit Process : One to two examples of each of the following unit processes. Nitration, sulphonation, friedel-crafts reaction, esterification, hydrolysis, oxidation, Halogenation, chloro-sulfhonation, reduction, polymerization, reactions of diazonium salts. **Instrumental methods of analysis :** Use of colourimeter pH meter, potentiometer, conductometer, refractometer, polarimeter

Materialtesting: Testing of alloys identification of plastics/rubber estimation of yield point, young's modulus, flaredness; Optical, thermal mechanical and electrical properties. **Process Instrumentation :** Transducers of different types. use of Tranducer for measuring flow control. Determinatiaon of flash point and ignition points of liquids.

Water analysis : Solid contents, Hardness, COD and other tests as per industrial specifications.

Flow measuring devices : Floats Monographs of reprsentative raw materials such as sulphuric acid, toluene, sodium, carbonate, sodium hyroxide, carbon tetrachloride benzoic acid (5-6 compounds). Limit tests for heavy metals Pb, AS, Hg, Fe and ash content.

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VOCATIONAL COURSE IN ELECTRONIC EQUIPMENT MAINTENANCE

SCHEME OF EXAMINANTION

		Max. Marks	Min. Pass Marks
Paper - I	Operational Principles of Audio	50	17
Paper - II	Microprocessor Based Instrumentation and Control	50	17
	Practicals	50	17

1. SUBJECT OBJECTIVE :

The objective of this syllabus is to femiliarize students with the fundamentals of electronics and prepares him/her to keep in track with fast change in this field so that he/she is prepared to takenup advance studies or go for self employment. It is proposed to give the students an idea of basics of all the developments in the field of electronics. Efforts are directed to impart some knowledge of computer hardware and software too, which fall in the realu of electronics so that the students become aware of fast changing scene of information superhigh wey also.

2. JOB POTENTIALS :

The students in (by) taking up this course may find adequta job- opportunities in industries or manufacturing firms. They may opt for setting up their own small scale industries of electronics, thus enhancing self employment.

3. **Contents :** As per attached syallbus.
4. Subject scheme.
5. On the job training will be imparted in Summer days.
6. As detailed out in the prospectus.
7. As per the draft given in the syllabus.
8. Permissible combination of subject Physics, Mathemetics & Electonic equipment mathematics.

PAPER - I

(Paper Code - 0859)

OPERATIONAL PRINCIPLES OF AUDIO AND VIDEO EQUIPMENTS

M.M. 50

UNIT-I Revision of All and FH, communication bands, signal sources, Basic Principles of propagation of e.m. wave through atmosphere and ionosphere; ground waves, sky waves, space waves, dead zones etc.

RECEIVING ANTENNAE: Antenna Parameters like gain, radiation pattern, effective aperture. Ferrite AE. Type of antennae like wire, loop, dish, Yagi, telescopic, their construction and operating principles.

SUPERHETERODYNE RECEIVERS: Principles, advantages, block diagram, RF input and AE co upling arrangments, RF amplifiers, mixer, local oscillator, IF amp. Detector, audio amplifier, loud speaker, power requirements, tuning/aligning of receivers, waveforms and voltages at different check points. Circuit reading of various radio sets, repair and trouole shooting, automobile radios.

UNIT-II ELEMENTS OF A TELEVISION SYSTEM : Picture transmission, sound transmis-sion, picture reception, sound reception, synchronisation.

TYPE VIDEO SIGNAL : Scanning sequence details, sync details of the 625 line system, channel bandwidth, vestigial sideband transmission, reception of vestigial sidepand signals, frequency modulation, FH channel band-width, channel bandwidth for colour transmission, allocation of frequancy bands for television bandwidth for colour transmission, allocation or frequancy bands for television signel transmission, television standards.

Picture tubes- monochrome and colour : Beam deflection, face plate, picture tube charecteristics, picture tube circuit controls.

UNIT-III TELEVISION RECEIVERS : Types of television receivers, receiver sections, video detector, video section fundamantals, video emplifiers-design principles, video amplifier circuits, autometic gain control and noise cancelling circuits, syno seperation circuits, syno-processing and AFC circuits, deflection circuits, sound system, RF tuner, video IF amplifiers, receiver power supplies, television receiver antennae, colour television antennae.

TELEVISION APLICATIONS : Television broadcasting, cable television, closed circuit television, theatre television, picture phone and facsimile, video tape recording (VTr, television via satellite, TV games, HDTV, flatoanel TV teleconferancing.

UNIT-IV TAPE RECORDERS : Principles of magnanic recording, characteristies of magnetism, the hysterists loop, recording head, recorded wave-length, response of head during reply, the effect of gap length, low frequency loss, other losses, equalization, the effect of non-linear characeristic of magnification recording bias, A.C. bias, erasin the tape, block diagram of audio tape recorder.

Oscillator, preamplifier, dolby, amplifier, record (play back) head, erase head, tapes (metal polymer), mechanical transport system, stereo recording, double deck, single deck, microphones (RF, Cable), noise, maintenance of mechanial parts, head cleaners, head alignment, graphic equalisers.

UNIT-V TELEPHONES : Modulation, demodulation, modem, subscribar frequency allotment, channel organisation, signalling, svitching, manual exchanges, STD, ISD, EFABX, Intercom-stress on equipment and EPABX, Value added services like FAX E mail.

MEASURING INSTRUMENTS : Multimeters analog/digital, oscilloscopes, signal generators, noise and sound level meters, frequency counters, error sources and precautions during measurement.

GENERAL NOTE : Familiarisation with catalogues, standard specification, knowledge about companies referring to service manual.

PAPER - II

MICROPROCESSOR BASED INSTRUMENTATION AND CONTROL

(Paper Code - 0860)

M.M. 50

UNIT-I MICROCOMPUTER FUNDAMENTALS : Introduction, simplified microcomputer architecture, simplified memory organization, instruction set, simplified CPU organisation, microcomputer operation, Personal computer organization and Word Processor. Data sheet descriptions, pin diagram and function, microprocessor architecture, using the data/address register, using the stack pointer.

UNIT-II THE INTEL 8080/8085 MICROPROCESSOR : Introduction, the 8085 pin diagram and functions, the 8085 architecture, addressing modes, the 8080/8085 instructions set, the 8080/8085 date transfer instructions, the 8080/8085 arithmatic instructions, the 8080/8085 logical instructions, the 8080/8085 stack, I/O, and machine control instructions.

UNIT-III PROGRAMMING THE MICROPROCESSOR : Machine and assembly languages, simplified instruction set, instruction set, arithmetic operations, instruction set-logical operations, instruction set-date transfar operations, instruction set branch operations, instruction set-subroutne all and return operations, instruction set-miscellaneous operations, writing a program, addressing modes, program branching, program looping using subroutines.

Programming the 8080/8085 microprocessor : Introduction, straight-line programs, looping programs, mathematical programs.

UNIT-IV INTERFACING THE MICROFROCESSOR : Introduction, interfacing with ROM, interfacing with RAM, input/output interfacing basics, interfacing with practical I/O ports, synohronizing I/O data transfers using interrupts. address decoding.

UNIT-V Application to illustrate the use of microprocessor in :

(i) Traffic control

(i) Tempereture control

(i) Digital clock

(iv) Stepper motor control

(v) Washing machine control

PRACTICALS

A student is required to do atleast 12 experiments in an academic year, and one month Summer Training. The scheme of practical examination will be as follows :

(i) One experiment of 3 hours duration and one Month Summer Training.

(i) Marks

Experiment	:	25 Marks
Sessional	:	10 Marks
One Month Summer Training	:	15 Marks
Total		**50 Marks**

* The marks for summer training will be awarded by the thachers teadhing the students on the basis of the certificate issued by the external supervisor of the summer training.

LIST OF PRACTICALS

1. Development of soldering skill by constructing a fewcircuits and testing.
2. PCB making.
3. Study of modulator.
4. Study of oscillator.
5. Tape recorder-testing, assembly and dis-assembly.
6. Radio receiver-testing.
7. Study of PA system and i.s. testing.
8. Study of EPABK, wiring and connectivity with telephone instruments.
9. Familiarisation with 8085 Based microprocessor trainer kit. Location of 8085, 8279, 8253 keyboard, display fields, EPROM Programmer, expansion s lot, TTY and serial lines.
10. Entering and executing an assembly language program, codes for insertion, deletion, memory move, block fill, setting and examining ragisters and memory, single step execution of a program.
11. Writing of a prgram to add. subtract and multiply two numbers stored in memory (nnnn & nnnn * 1) and place the result in the subsequent memory, (nnn * 2).
12. Writing of a program to test R.H. for errors by writing O's & 1's in altornaco location and reading it for chaecking.
13. Making of a board with a 3LED's and four switches to connect to the 8085 kit on the expansion slot (8279).
14. Making of a board with a 8 LED's and four switches to connect to the 8-85 kit on the expansion slot (8255).
    (a) Program the 8255 to glow/switch of LED's.
    (b) Program the 8255 to switch on and OFF the LED's every few second according to a given pattern (Hint : The pattern can be 01010101 and 10101010 or 001001100, or any other).

Reference Books:

1. Fundamentals of acoustics : Kinsler & Frey
2. System trouble shooting Handbook : Luces K, Faulken Berry (John Wiley & Sons)
3. Monochrom & Colour Television : P.R. Gulati
4. Television Engineering : Dhake
5. Microprocessor : Gaonkar
6. Microprocessor : B. Ram
7. Microprocessor : Shaum Saries

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B.SC.-II
COMPUTER SCIENCE
PAPER - I
COMPUTER HARDWARE
(PAPER CODE - 0855)

DURATION 3 HOURS **MAX.MARKS 50**

AIM - The emphasis in on the design concepts &organisational details of the common PC,learning the complicated electronics of the system of the computer Engineers.

OBJECT OF THE COURSE -

1. To introduce the overall organisation of the microcomputers.
2. To introduce the common peripheral devices used in computers.
3. To introduce the hardware components, use of micro processor and function ofvarious chips used in microcomputer.

N.B. : Since the computer organisation study is very vast & complicated, so the study isrestricted to only the description and understanding part, fence the paper setter isrequested to keep this important factor in mind.

UNIT-I CLASSIFICATION AND ORGANIZATION OF COMPUTERS

Digital and analog computers and its evolution. Major components of digital computers;Memory addressing capability of CPU; word length and processing speed of computes.Microprocessors single chip microcomputers; large and small computers. Usersinterface Hardware software and firmware. multi programming multi user system.Dumb smart and intelligent terminals computer network and multi processing, LANparallel processing. Flinn's classification of computers. Computer flow and data flowcomputers.

UNIT-II CENTRAL PROCESSING UNIT.

CPU organization, ALU control unit registers. Instructions for INTEL 8085, Instructionword size, Various addressing mode interrupts and exceptions, some special Controlsignals and I/O devices. Instruction cycle fetch and execute operation, time Diagram,data flow.

UNIT-III MEMORY OF COMPUTERS.

Main memory secondary memory, backup memory, cache memory; real and virtualMemory Semiconductor memory. Memory controller and magnetic memory; RAM;disks, optical disks Magnetic bubble memory; DASD, destructive and non destructive.readout. Program of data Memory and MMU.

UNIT-IV I/O DEVICES.

I/O devices of micro controller; processors. I/O devices, printer, plotter, other output devices, I/O port serial data transfer scheme, Micro controller, signal processor,I/O processor I/O processor arithmetic processor.

UNIT-V SYSTEM SOFTWARE AND PROGRAMMING TECHNIQUE.

ML, AL, HLL, stac subroutine debugging of programs macro, micro programming,Program Design, software development, flow & chart multi programming, multiuser,multi tasking Protection, operating system and utility program, application package.

RECOMMENDED BOOKS :

1. Computer Fundamentals : Architecture and Organization - By B.Ram (Wilwy EasternLtd.)
2. Computers Today - By Donal H. Sanders
3. Computers Fundamental - By Rajaraman.
4. IBM PC - XT Clones - By GovindaRajalu

B.Sc.-II
PAPER - II
SOFTWARE
(Paper Code - 0856)

AIM - Introduction to the web-language-HTML & problem solving through the concept ofobject oriented programming.

OBJECT OF THE COURSE -

1. To introduce the internet & web related technology & learn the intricacies of web-pagedesigning using HTML.
2. To introduce the object oriented programming concept using C++ language.
3. To introduce the problem solving methodology using the C++ programming features.

N.B. : Examiners are requested to prepare unit-wise Questions papers.

UNIT-I HTML BASICS & WEB SITE DESIGN PRINCIPLES

Concept of a Web Site, Web Standards, What is HTML? HTML Versions, NamingScheme for HTML Documents , HTML document/file, HTML Editor , Explanationof the Structure of the homepage , Elements in HTML Documents ,HTML Tags, BasicHTML Tags, Comment tag in HTML, Viewing the Source of a web page, How todownload the web page source? XHTML, CSS, Extensible Markup Language (XML),Extensible Style sheet language (XSL), Some tips for designing web pages, HTMLDocument Structure. HTML Document Structure-Head Section, Illustration ofDocument Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META,<TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML DocumentStructure-Body Section:-Body elements and its attributes: Background; BackgroundColor; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin,Organization of Elements in the BODY of the document: Text Block Elements; TextEmphasis Elements; Special Elements — Hypertext Anchors; Character-LevelElements; Character References ,Text Block Elements: HR (Horizontal Line); Hn(Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE; TABLE; DIV (HTML3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, SpecialElements — Hypertext Anchors ,Character-Level Elements: line breaks (BR) andImages (IMG), Lists , ADDRESS Element, BLOCKQUOTE Element, TABLEElement, COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & PhysicalStyles, Netscape, Microsoft and Advanced Standard Elements List, FONT,BASEFONT and CENTER.

UNIT-II IMAGE, INTERNAL AND EXTERNAL LINKING BETWEEN WEBPAGES

Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT andCENTER Insertion of images using the element IMG (Attributes: SRC (Source),WIDTH, HEIGHT, ALT (Alternative), ALIGN),IMG (In-line Images) Element andAttributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal andExternal Linking between Web Pages Hypertext Anchors ,HREF in Anchors ,Linksto a Particular Place in a Document ,NAME attribute in an Anchor ,Targeting NAMEAnchors ,TITLE attribute, Practical IT Application Designing web pages links witheach other, Designing Frames in HTML. Practical examples.

UNIT-III INTRODUCTION TO OOP

Advantages of OOP, The Object Oriented Approach, Characteristics of objectoriented languages- Object, Classes, Inheritance, Reusability, Polymorphism and C++.

Function: Function Declaration, Calling Function, Function Defines, PassingArgument to function, Passing Constant, Passing Value, Reference Argument, returning by reference, Inline Function, Function Overloading, Default Arguments infunction.

UNIT-IV OBJECT CLASSES AND INHERITANCE

Object and Class, Using the class, class constructor, class destructors, object asfunction argument ,copy constructor ,struct and classes , array as class member,Static Class Data, Static Member Functions, , Friend function, Friend class, operatoroverloading. Type of inheritance, Base class, Derive class. Access Specifier:protected. Function Overriding, member function, String, Template Function.

UNIT-V POINTERS AND VIRTUAL FUNCTION

pointers: & and * operator pointer variables, .pointer to pointer, void pointer,pointerand array, pointer and function, pointer and string, memory management, new anddelete, pointer to object, this pointer Virtual Function: Virtual Function, Virtualmember function, accesses with pointer,pure virtual function

File and Stream: C++ streams, C++ Manipulators, Stream class, string I/O, charI/O, Object I/O, I/O with multiple object, Disk I/O,

RECOMMENDED BOOKS :

1. Introduction to HTML	:	KamleshAgarwala, O.P.Vyas, Prateek A. Agrawala (KitabMahal Publication)
2. Let us C++	:	Y. Kanetkar B.P.B Publication
3. Programming in C++	:	E. Balaguruswami
4. Mastering in C++	:	VenuGopal
5. Object Oriented Programming in C++	:	Lafore R, Galgotia Publications.

Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

Session 2019-20

June 2019 onwards

Class: B.Sc. Electronics

Scheme of Examination

Paper Code	Course Opted	Title of Course	Theory	Practical	Grand Total	Minimum Passing Marks
First Year						
ELB-101	Core Course	Network Analysis And Analog Electronics	**50**		**100**	**33**
ELB-102	Core Course	Linear and Digital Integrated Circuits	**50**			
ELB-103P	Core Course Practical/Tutorial	Networks Analysis and Analog Electronics Lab	**25**	**50**	**50**	**17**
ELB-104P	Core Course Practical/Tutorial	Linear and Digital Integrated Circuits Lab	**25**			
Second Year						
ELB-201	Core Course	Communication Electronics	**50**		**100**	**33**
ELB-202	Core Course	Microprocessor and Microcontrollers	**50**			
ELB-203P	Course Practical/Tutorial	Communication Electronics Lab	**25**	**50**	**50**	**17**
ELB-204P	Course Practical/Tutorial	Microprocessor& Microcontroller Lab	**25**			
Third Year						
EL301	**Skill Enhancement Course**	Industrial Electronics	**50**		**100**	**33**
EL302	**Skill Enhancement Course**	Mobile Application Programming and Introduction to VHDL	**50**			
EL303P	**Skill Enhancement CoursePractical**	Industrial Electronics Lab	**25**	**50**	**50**	**17**
EL304P	**Skill Enhancement Course Practical**	Mobile Application Programming and Introduction to VHDL Lab	**25**			

B. Sc. Part II

ELECTRONICS

Paper I

ELB 201: COMMUNICATION ELECTRONICS

Theory: **Max. Marks :50**

Unit-1

Electronic communication: Introduction to communication – means and modes. Needfor modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

Unit-2

Analog Modulation: Amplitude Modulation, modulation index and frequency spectrum.Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver

Analog Pulse Modulation: Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

Unit-3

Digital Pulse Modulation: Need for digital transmission, Pulse Code Modulation,Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK).

Optical Communication: Introduction of Optical Fiber, Block Diagram of optical communication system.

Unit-4

Introduction to Communication and Navigation systems:

Satellite Communication– Introduction, need, Geosynchronous satellite orbits,geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

Unit-5

Mobile Telephony System – Basic concept of mobile communication, frequency bandsused in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitativeonly).GPS navigation system (qualitative idea only)

Reference Books:

1. Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
2. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
4. Electronic Communication systems, G. Kennedy, 3rdEdn., 1999, Tata McGraw Hill.
5. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
6. Communication Systems, S. Haykin, 2006, Wiley India
7. Electronic Communication system, Blake, Cengage, 5th edition.
8. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

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Paper II

ELB 202 :MICROPROCESSOR ANDMICROCONTROLLER

Theory: **Max. Marks :50**

Unit-1

Microcomputer Organization: Input/Output Devices. Data storage (idea of RAM andROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.
8085 Microprocessor Architecture: Main features of 8085. Block diagram. Pin-outdiagram of 8085. Data and address buses. Registers. ALU. Stack memory. Program counter.

Unit-2

8085 Programming : Instruction classification, Instructions set (Data transfer includingstacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops. Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts.

Unit-3

8051 microcontroller: Introduction and block diagram of 8051 microcontroller,architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.

Unit 4

8051 I/O port programming: Introduction of I/O port programming, pin out diagram of8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation.
8051 Programming: 8051 addressing modes and accessing memory locations usingvarious addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions,

Unit 5

8051 programming in C: for time delay & I/O operations and manipulation, for arithmetic and logic operations, for ASCII and BCD conversions.
Introduction to embedded system: Embedded systems and general purpose computersystems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press
5. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
6. Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India
7. Introduction to embedded system, K.V. Shibu, 1st edition, 2009, McGraw Hill
8. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

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ELECTRONICS LABORATORY

The scheme of practical examination will be as follows-

Experiment	**--**	**30**
Viva	**--**	**10**
Sessional	**--**	**10**
Total	**--**	**50**

ELB 203P: COMMUNICATIONELECTRONICS LAB

(Hardware and Circuit Simulation Software) 60 Lectures

Max.Marks:25

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.

ELB 204P: MICROPROCESSOR ANDMICROCONTROLLER LAB(Hardware and Circuit Simulation Software)

Max.Marks:25

At least 06 experiments each from Section-A and Section-B

Section-A: Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).

Section-B: Experiments using 8051 microcontroller:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

Reference Books:

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning.

B.Sc.-II
INFORMATION TECHNOLOGY
PAPER - I
DIGITAL CIRCUITS & COMPUTERH/W
(Paper Code - 0874)

UNIT-I(A) Number Systems :
Octal and hexadecimal number, decimal rep., complements, addition, subtraction, multiplication, division, fixed point rep, floating point rep., other binary code- gray code, excess 3 gray, 2421, etc. error detection code.

(B) Boolean Algebra :
Laws, demorgan'stheorem, Simplification boolean expression & logic diagram, positive & negative logic, K-map and simplification of K-map.

UNIT-II Combinational circuits :
Half adder, full adder, flip-flop : SR, JK, D,T, sequential circuits : encoder, decoder, multiplexer, shift register, binary counters, BCD adder.

UNIT-III Multivibratorcircuits :
Monostable, astable, bistable, smitt trigger, clocked RS, master-slave flip-flop, edge triggered flip-flop, latch.
Intergratedcircuits :
RTL, DITL, TTL, CMOS, MOS.

UNIT-IV (A) Central Processing Unit :
Introduction, register organisation, stack organisation, Instruction formats, Addressing modes.

(B) I/O Organisation :
I/O interfaces, Data transfer, types and modes, interrupts, DMA, IOP.

UNIT-V Memory Organisation :
Memory hierarcy, main memory, Auxiliary memory, Associative memory, cache memory, virtual memory, memory management techniques.

REFERENCE TAXT BOOK :

1.	Integrated Electronics	-	Millman&Halkias
2.	Principle of Electronics	-	V.K. Mehta
3.	Digital Electronics	-	R.P. Jain
4.	Computer System Architecture	-	Morris Mano
5.	Digital Electronics & Computer Hardware	-	Morris Mano

B.Sc.-II
PAPER - II
(Paper Code - 0875)

UNIT-I Introduction to OPP : Advantages of OPP, the Object oriented approach, characteristics of object oriented languages : object, classes, inheritance, reusability, polymorphism and C++.

UNIT-II Function **:** function declaration, calling function, function definition, passing arguments to function, passing constant, passing value, fegerence argument, returning by reference, inline function, function overloading, default arguments in function.

UNIT-III Object and Classes, using the Classes Constructor, class destructor, object as function argument, copy constructor, struct and classes, array as class member, static class data, static member functions, friend function, friend class, operator overloading, type of inheritance, base class derive class, access speceifier, protected, member function.

UNIT-IV Pointers : & and * operator pointer variables, pointer to pointer, void pointer, pointer and array, pointer and functions, pointer and string, memory management, new and delete, pointer to object, this pointer, virtual function : virtual function, virtual member function, accesses with pointer, pure virtual function.

UNIT-V File and stream : C++ steams, C++ manipulators, Stream class, string I/O, char I/O, object I/O, I/O with multiple objects, disk I/O.

REFERENCE TEXT BOOKS:

1.	Programming in C++	-	E. Balaguruswami
2.	Mastering in C++	-	VenuGopal
3.	Object Oriented Programming in C++	-	Robert Lafore
4.	Let us C++	-	Y. Kanetkar

PRACTICAL WORK

1. The sufficient Practical work should be done for understanding the paper 2.
2. At least five programs on each unit from unit 2 to unit 5 be prepared.
3. All practical works should be prepared in form of print outs and be valuated while practical examination.

INDUSTRIAL MICROBIOLOGY

Paper	Title	Time	Marks
First	Environmental Microbiology and Biostatistics	3 hrs.	50
Second	Microbial Physiology and Immunobiotechnology	3 hrs.	50
	PRACTICAL Examination	4 hrs.	50
	(including sessionals)		(40+10)

Note : During Two months Summer Vacation, students will visit some Industries. He/She will submit "Summer Job-Training Report" in B.Sc. IIrd Year Viva Voce Exam.

PAPER - I

ENVIRONMENTAL MICROBIOLOGY AND BIOSTATISTICS

(Paper Code - 0876)

M.M.50

UNIT-1 Our environment : Soil, water and air. Concept of environment in relation to microbes. Environment included physiological adaptations in microorganisms. Nature of microbial population in soil, water and air. Biogeochemical cycling - Carbon, Nitrogen, Sulphur and Phosphorus.

UNIT-2 Population interactions : Neutralism, Commensalism, Synergism, Mutualism, Antago-nistic relationships. Mycorrhizal associations. VAM and its importance.

UNIT-3 Nitrogen fixation by symbiotic and non-symbiotic microorganisms. Use of microorgan-isms as biofertilizers. Mass cultivation of Rhizobium and Azotobacter. Use of blue-green algae as biofertilizers.

UNIT-4 Liquid waste disposal. Nature of domestic and municipal waste and sewage. Sewage treatment. Solid waste disposal. Methods of disposal of Agricultural waste.

UNIT-5 Basic idea of probability, normal, binomial and poisson distribution. Mean, Mode and Median. Chi-Square test. Exponential and Logarithemic Functions.

PRACTICALS

1. Isolation of Microorganisms from Air.
2. Isolation of Microorganisms from Water.
3. Isolation of Microorganisms from soil.
4. Determination of MPN of faecal contaminants in water.
5. Measurment & confirmation of E. coli in water sample.
6. Biochemical tests for identification of enteric bacteria.
7. Study of Rhizobium from root nodules.
8. Study of symbiotic and non-symbiotic blue-green algae.
9. Problems based on the determination of Mean, Madian and Mode.
10. Problems on Chi-Square Test.
11. Experiments to demonstrate Symbiotic, Antagonistic acticvities and relations amongst microbes and their interactions with plants.

29/7/12 29/7/12

RECOMMENDED BOOKS :

1. Introduction to Soil Microbiology by Martin Alexander.
2. General Microbiology by Pelczar, Reid & Chan.
3. Biofertilizers in Agriculture by N.S. Subba Rao.
4. Statistics by Mishra & Mishra.
5. General Microbiology, Vol. II, by Power & Daginawala.

PAPER - II

MICROBIAL PHYSIOLOGY AND IMMUNABIOTECHNOLOGY
(Paper Code - 0877)

M.M. 50

UNIT-1 Diffusion, gaseous exchange, Osmosis, Plasmolysis, Biochemical properties of membernes, Passive and Active trnaport mechanism. Role of ionophores, group translocation across the memberanes.

UNIT-2 Photosynthetic microbes, Osygenic and non-oxygenic reaction centre. Electron transport, Photophosphorylation, Calvin Cycle. Photorespiration and its significance. Effect of various factors on rate of photosynthesis.

UNIT-3 Respiration mechanisms - Breakdown of carbohydrates through glycolysis, Kreb's cycle. Fermentation. Pentose Phosphate Pathway. Fermentation of alcohol, Citric acid and acetic acid.

UNIT-4 Methanogens and Methylotrophs. Sulphur utilizing bacteria. Sulphate reduction pathway. Economic importance of Methylotrophs and sulphur utilizing bacteria.

UNIT-5 History and Scope of immunology, Types of immunity. Antigen-Antibody reactions. Immunoglobulins - Structure and functions.
Production of Vaccines and Monoclonal antibodies.

PRACTICAL

1. Isolation of photosynthetic bacteria and cyanobacteria from soil.
2. Isolation and characterisation of Methanogens.
3. Study of Hydrogen-production by bacteria.
4. Measurement of nitrate uptake by microorganisms.
5. Study of nitrate and nitrite reduction by microorganisms.
6. Demonstration of evolution during photosynthesis.
7. Demonstration of plasmolysis, osmosis, active and passive transport mechanism.
8. Testing of Blood Groups.
9. Titration of Antigen and Antibody.
10. Precipitation reaction of antigens and antibodies.

BOOK RECOMMENDED :

1. Cell Biology by Pawar.
2. General Microbiology, Vol. II, by Power and Daginawala.
3. Immunology by Davis.
4. Immunology by G.P. Ta

29/7/17 29/7/17

BIOCHEMISTRY

PAPER - I

E N Z Y M O L O G Y **M.M. 50**

UNIT-I INTRODUCTION

History, general characteristics, nomenclature, IUB enzyme classification (rationale, over view and specific examples), significance of numbering system. Definitions with examples of holoenzyme, apoenzyme, coenzymes. cofactors, activators, inhibitors, active site (identification of groups excluded), metallo-enzymes, units of enzyme activity, specific enzymes, Isoenzymes, monomeric enzymes, oligomeric enzymes and multienzyme complexes. Enzyme specificity.
Hostorical perspective, nature of non-enzymatic and enzymatic catalysis. Measure-men and expression of enzyme activity-enzyme assays. Definition of IU, Katal, enzyme turn over number and specific acitivity. Role of non-protein organic molecules and inorganic ions coenzyme, prosthetic groups. Role of vitamins as coenzymes precursors (general treatment).

UNIT-I ENZYME CATALSIS

Role of cofactors in enzyme catalysis : NAD/NADP+, FMN/FAD, coenzyme A, biocytin, cobamide, lipoamide, TPP, pyridoxal phosphate, tetrahydrofolate and metal ions with special emphasis on coenzyme functions. Acid-base catalysis, covalent, proximity and orientaton effects, strain and distortion theory. Mechanism of action of chymotrypsin, carboxypeptidase, ribonuclease and lysozyme.

UNIT- I ENZYME PURIFICATION

Methods for isolation, purification and characterization of enzymes.

UNIT-IV ENZYME KINETICS

Factors affecting enzyme activity : enzyme concentration, substrate concentration, pH and temperature. Derivation of Michaelis-Menten equation for uni-substrate reactions. Km and its significance. Line weaver-Burk plot and its limitations. Importance of Kcal/ Km . Bi-substrate reactions-brief introduction to sequential and ping-pong mechanism with examples.
Kinetics of zero and first order reactions. Significance and evaluation of energy of activation and free energy.
Reversible and irreversible inhibition, competitive, non-competitive and uncompetitive inhibitions. determination of K_m & V_{max} in presence and absence of inhibitor. Allosteric enzymes.

UNIT-V INDUSTRIAL AND CLINICAL APLLICATION OF ENZYME.

Immobilization of enzyme and their industrial applications. Production of glucose from starch, cellulose and dextran; use of lactase in dairy industry; production of glucose-fructose syrup from sucrose; use proteases in food, detergent and leather industry; medical application of enzymes. use of glucose oxidase in enzyme electrodes.

PAPER - II

INTERMEDIARY METABOLISM M.M. 50

UNIT-I INTRODUCTION TO METABOLISM

General features of metabolism, experimental approaches to study metabolism; use of intact organism, becterial mutants, tissue slices, stable and radioactive isotopes.

CARBOHYDRATE METABOLISM

Reactions and energetics of glycolysis. Alcoholic and lactic acid fermentations. Entry of fructose, galactose, mannose etc. Reactions and energetics of TCA cycle. Gluconeogenesis, glycogenesis and glycogenolysis, Reactions and physiological signifacance of pentose phosphate pathway. Regulation of glycolysis and TCA cycle. Photosynthesis, a brief review.

UNIT-II ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION

Structure of mitochondria, sequence of electron carriers, sites of ATP production, inhibitors of electron transport chain. Hypothesis of mitochondrial oxidative phospho-rylation (basic concepts). Inhibitors and uncouplers of oxidative phosphorylation. Transport of reducing potentials into mitochondria.

UNIT-III LIPID METABOLISM

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria.

$\beta-$ oxidation of saturated fatty acids, ATP yield from fatty acid oxidation. Biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterol. Regulation of cholesterol metabolism.

UNIT-IV AMINO ACID METABOLISM

General reactions of amino acid metabolism : transmination, oxodative deamination and decarboxylation. Urea cycle. Degradation and biosynthesis of amino acids. Glycogenic and ketogenic amino acids.

UNIT-V NUCLEOTIDE METABOLISM

Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

PORPHYRIN METABOLISM

Biosynthesis and degradation of porphyrins. Production of bile pigments.

PRACTICAL

1. Separation of Blood Plasm and Serum
   a. Estimation of proteins from serum by biuret and lowry methods.
   b. Determination of albumin and A/G ratio in serum.
2. Estimation of bilirubin (conjugated and unconjugated) in serum.
3. i Estimation of total lipids in serum by vanillin method.
   ii. Estimation of cholesterol in serum.
4. Estimation of lipoproteins in plasma.
5. Estimation of lactic acid in blood before and after exercise.
6. Estimation of blood urea nitrogen from plasma.
7. Separation and identification of amino acids by (a) paper chromatography and (b) thin-layer chromatography.
8. Separation of polar and non-polar lipids by thin-layer chromatography.
9. Estimation of SGPT and SGOT in serum.
10. a. Assay of serum alkaline phosphatase activity.
    b. Inhibition of alkaline phosphatase activity by EDTA.
    c. Effect of substrate concentration on alkaline phosphatase activity and determination of its K_m value.
11. a. Effect of temperature on enzyme activity and determination of activation energy.
    b. Effect of pH on enzyme activity and determination of optimum pH.
    c. Effect of enzyme concentration on enzyme activity.
12. a. Preparation of starch from potato and its hydrolysis by salivary amylase.
    b. Determination of achromatic point in salivary amylase.
    c. Effect of sodium chloride onamylases.

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Syllabus of Biotechnology

(B. Sc. II Year)

Session

2019-2020
2020-2021

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)
B.Sc. II
BIOTECHNOLOGY

PAPER – I

MOLECULAR BIOLOGY & BIOPHYSICS

M.M. 50

UNIT-I

1. Nucleic Acid: Bases, Nucleosides and Nucleotides, DNA and RNA structure.
2. Plasmids.
3. Transposons: Repetitive elements, LINEs & SINEs, Structure of Gene.

UNIT-II

1. DNA Replication: Enzymes involved and mechanism of DNA Replication in Prokaryotes.
2. Mutation: Molecular level of Mutation, Types of Mutagens, Spontaneous and Induced Mutation.
3. DNA Repair: NER, BER and Mismatch Repair.

UNIT-III

1. Genetic Code: Features, Condon Assignment and Wobble hypothesis.
2. Transcription: Initiation, Elongation and Termination in Prokaryotes.
3. Translation: Initiation, Elongation and Termination Translation machinery in Prokaryotes. Operon-Concept of Operator, Regulator, Promoter gene, Inducer and Co-repressor.

UNIT –IV

1. Biophysics : Introduction, Scope and Application
2. Principle, Structure, Functions of the following:
   a. Microscopy b. Colorimeter and Spectroscopy c. Electrophoresis
   d. Centrifugation e. Chromatography.

UNIT –V

1. Radioisotopes techniques: Measurement of radioactivity, Ionization Chambers, Geiger Muller and Scintillation Counter.
2. Autoradiography and DNA Fingerprinting.
3. Biosensor.

10.6.19 10.6.19 10/6/19 10.6.19

List of Books

1. Gerald Karp - Cell and Molecular biology, 4th Edition (2005).
2. Lewis J.Klein Smith and Valerie M.Kish-Principles of cell and molecular biology-Third
3. Edition (2002)
4. P.K. Gupta- Cell and molecular biology, Second Edition (2003), Rastogi publications.
5. Richard M-Twyaman-Advanced Molecular Biology, First South Asian Edition (1998), VivaBooks Pvt. Ltd.
6. K. Wilson and J.Walker (2012) Principle and Techniques of Biotechnology and MolecularBiotechnology.
7. Upadhya and Upadhya : Biophysical Chemistry.
8. David, I. Nelson and Michael M.Cox :Lehniger : Principal of Biochemistry 4th Edition. W.H. Freeman and Company, New York.
9. Buchanan, Gruissemen& Jones (2015) Biochemistry & Molecular Biology of Plant, 2nd edition.

B.Sc. II
BIOTECHNOLOGY

PAPER II

RECOMBINANT DNA TECHNOLOGYAND GENOMICS

M.M. 50

UNIT-I

1. Recombinant DNA technology: General concept. Steps in gene cloning and application.
2. Host controlled Restriction Modification System, Ligases and Polymerases, Klenow fragment, Taq, Pfu polymerase and Nuclease (Endo, Exo and restriction endonuclease).
3. Modification Enzyme (Kinase, Phosphates and terminal deoxynucleotidyl transferase). Reverse Transcriptase.

UNIT –II

1. Vectors: Plasmid, Bacteriophages, Cosmid, SV40 and Expression vectors.
2. Gene Library: Genomic and cDNA library.
3. Selection and Screening of Recombinants: Genetic and Hybridization methods.

UNIT –III

1. PCR: Types of PCR, Steps (Denaturation, Annealing and Extension); Applications, Advantages and Limitation of PCR.
2. Molecular Marker-RFLP, RAPD and Micro array.
3. Human Genome Project.

UNIT-IV

1. Basic concept of Gene Transfer Methods: Microinjection, Electroporation, Lipofection and Microprojectile.
2. Gene Therapy: *In vivo* and *Ex vivo*, Germ line and Somatic gene therapy.
3. Basic idea of Stem cell technology: Types of stems cell cultures and their Significance.

UNIT-V

1. Introduction to Bioinformatics: History, Objective and Application.
2. Major Bioinformatics Resource – NCBI , Types of Databases (Primary and Secondary Databases) , BLAST and FASTA
3. Basic concept of Genomics and Proteomics

10.6.19 10.6.19 10/6/19 10.6.19

List of Books

1. B.D. Singh (2004) Biotechnology, Expanding Horizons. First Edition. Kalyani Publishers, Ludhiana.
2. P.K. Gupta (2005) Biotechnology and Genomics, Rastogi Publication, Meerut.
3. Stan bury and Whittaker - Principles of Sterilization techniques, First Indian reprint Edition (1997). Aditya Book (P) Ltd. New Delhi.
4. L.E. Casida (1994)Industrial Microbiology Edition .
5. A.H. Patel (2003) Industrial Microbiology 4th Edition.
6. K.S. Bilgrami and A.K. Pandey(1998) Introduction to Biotechnology Edition 2nd (1998)
7. U Satyanarayan (2005) Biotechnology, First Edition Books and Allied (P) Ltd. Kolkata.
8. Atul kumar and VandanaA.Kumar (2004) Plant Biotechnology and tissue culture, Principle and Perspectives, International Books Distributing Co. Lucknow.
10. S Choudhuri, and DB Carlson (2008) Genomics: Fundamentals and applications, 1st edition.
11. TK Attwood and DJ Parry (2009) Introduction of Bioinformatics.
12. Philip E Bourne Helge Whisking (2003) Structural Bioinformatics.
13. Des Higgins and Willie Taylor (2000) Bioinformatics Sequence, Structure and Databanks.

List of Practical's

MOLECULAR BIOLOGY, BIOPHYSICS, RECOMBINANT DNA TECHNOLOGY AND GENOMICS

1. Isolation of DNA from Plant cell.
2. Estimation of DNA by DPA method.
3. Isolation RNA from yeast cells

Experiment based on-

4. Centrifugation
5. Spectrophotometer/Colorimeter
6. Electrophoresis
7. Paper chromatography/TLC

Experiment based on Bioinformatics -

8. Retrieve DNA /Protein sequence from Biological Data Bases (NCBI).
9. Use of tools studied

SCHEME FOR PRACTICAL EXAMINATION

Time: 4 hrs. M.M.: 50

1. Experiment based on DNA/RNA	10 marks
2. Experiment based on Instruments	10 marks
3. Experiment based on Bioinformatics	10 marks
4. Spotting	10 marks
5. *Viva - Voce*	05 marks
6. Record / Sessional	05 marks

HEMCHNAD YADAV VISHWAVIDYALAYA, DURG (C.G.)

Website -www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.A. (Hindi) Semester Exam

UNDER

FACULTY OF ARTS

Session 2021-23

(Approved by Board of Studies)
Effective from June 2021

एम.ए. हिन्दी अंक विभाजन सेमेस्टर प्रणाली

प्रथम सेमेस्टर अंक विभाजन

	प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
प्रथम :	(आदिकाल एवं पूर्व मध्यकाल)	80	20	100
द्वितीय :	प्राचीन एवं मध्यकालीन काव्य	80	20	100
तृतीय :	आधुनिक काव्य–1 (छायावाद एवं पूर्ववर्ती काव्य)	80	20	100
चतुर्थ :	नाटक, एकांकी एवं चरितात्मक कृति	80	20	100
			कुल	400 अंक

द्वितीय सेमेस्टर अंक विभाजन

प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
पंचम :(उत्तर मध्यकाल एवं आधुनिक काल)	80	20	100
षष्ठ : मध्यकालीन काव्य	80	20	100
सप्तम :आधुनिक काव्य–2 (प्रगतिवाद, प्रयोगवाद, नई कविता एवं समकालीन कविता)	80	20	100
अष्टम : उपन्यास, निबंध एवं कहानी	80	20	100
		कुल	400 अंक

तृतीय सेमेस्टर अंक विभाजन

प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
प्रथम : साहित्य के सिद्धांत तथा अलोचना शास्त्र	80	20	100
द्वितीयः भाषा विज्ञान	80	20	100
तृतीयः कामकाजी हिन्दी एवं पत्रकारिता	80	20	100
चतुर्थ : भारतीय साहित्य	80	20	100
		कुल	400 अंक

चतुर्थ सेमेस्टर अंक विभाजन

प्रश्न पत्र	बाह्य परीक्षा	आंतरिक मूल्यांकन	कुल अंक
पंचमः हिन्दी आलोचना तथा समीक्षा शास्त्र	80	20	100
षष्ठ : हिन्दी भाषा	80	20	100
सप्तम : मीडिया लेखन एवं अनुवाद	80	20	100
अष्टमः जनपदीय भाषा और साहित्य (छत्तीसगढ़ी)	80	20	100
		कुल	400 अंक

टीपः– प्रत्येक प्रश्न पत्र में 20 अंकों के आंतरिक मूल्यांकन के अंतर्गत दो आंतरिक मूल्यांकन का आयोजन अनिवार्य होगा एवं इसका मूल्यांकन विभाग के शिक्षको के द्वारा किया जावेंगा तथा प्राप्तांक विश्वविद्यालय को प्रेषित किया जावेगा ।

5/7/2021 डॉ आशा दीवान (डॉ. विश्राम शर्मा)

एम.ए. – हिन्दी
प्रथम सेमेस्टर
प्रश्न पत्र – प्रथम
हिन्दी साहित्य का इतिहास (आदिकाल एवं पूर्व मध्यकाल)

योग : 80

पाठ्य विषयः–

इकाई–1 **हिन्दी साहित्य का इतिहास : परम्परा और पद्धतिः**

हिन्दी साहित्य के इतिहास लेखन की परम्परा, साहित्येतिहास के पुनर्लेखन की समस्याएँ। हिन्दी साहित्य के इतिहास का काल–विभाजन और नामकरण, आदिकाल के नामकरण की समस्या।

इकाई–2 **आदिकालः**

हिन्दी साहित्य के आदिकाल की सांस्कृतिक पृष्ठभूमि, रासो काव्य, सिद्ध नाथ एवं जैन साहित्य, लौकिक साहित्य, साहित्यिक प्रवृत्तियाँ, प्रतिनिधि रचनाकार ।

इकाई–3 **पूर्व मध्यकाल (भक्ति काल), भक्ति आंदोलन :**

उद्‌भव और विकास, हिन्दी क्षेत्र में भक्ति आंदोलन की सांस्कृतिक पृष्ठभूमि एवं उसका विकास, भक्ति काल की प्रमुख प्रवृत्तियाँ, तथा दार्शनिक विचारधाराएँ।

इकाई–4 **भक्तिकाल की विभिन्न काव्य-धाराएँ :**

निर्गुण काव्य : ज्ञानमार्गी काव्यधारा एवं प्रेममार्गी काव्यधारा - परम्परा, प्रवृत्ति एवम उसका विकास। सगुण काव्य : कृष्ण भक्ति काव्य–धारा एवं रामभक्ति काव्य धारा- परंपरा, प्रवृति एवं उसका विकास।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1 X 15	=	15 अंक
प्रश्न 3 –	1 X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 – लघुत्तरीय	5 X 2	=	10 अंक
– वस्तुनिष्ठ	10 X 1	=	10 अंक
	योग	=	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

निर्धारित पुस्तकें :–

1. हिन्दी साहित्य का इतिहास (संशोधित – आचार्य रामचंद्र शुक्ल)

2. हिन्दी साहित्य का आदिकाल – हजारी प्रसाद द्विवेदी

3. हिन्दी साहित्य का इतिहास (नेशनल पब्लिशिंग हाऊस, दिल्ली) – डॉ. नगेन्द्र

4. आदिकालीन हिन्दी साहित्य (वाराणसी विश्वविद्यालय प्रकाशन) – डॉ. शम्भूनाथ पाण्डेय

5. आदिकालीन हिन्दी साहित्य सांस्कृतिक पीठिका (हिन्दी ग्रंथ अकादमी) – डॉ. राममूर्ति त्रिपाठी

6. हिन्दी साहित्य का दुसरा इतिहास – डॉ. बच्चन सिंह

7. हिन्दी साहित्य और संवेदना का विकास–राम स्वरूप चतुर्वेदी (लोकभारती प्रकाशन)

8. हिन्दी साहित्य का सरल इतिहास – विश्वनाथ त्रिपाठी (ओरियन्ट लॉगमैन)

9. हिन्दी साहित्य उद्‌भव और विकास – हजारी प्रसाद द्विवेदी।

5/7/2021 डॉ आशा तिवारी (डॉ. खिमाराम शर्मा)

एम. ए. (हिन्दी)
प्रथम सेमेस्टर
प्रश्न पत्र – द्वितीय
प्राचीन एवं मध्यकालीन काव्य
(रासो काव्य, लौकिक काव्य एवं निर्गुण काव्य)

योग : 80

पाठ्य विषयः–

व्याख्या एवं विवेचन के लिए निम्नांकित चार कवियों का अध्ययन अपेक्षित है ।

1. चंदबरदाई : पृथ्वीराज रासो, संपादक आचार्य हजारी द्विवेदी, डॉ. नामवर सिंह (पद्मावती समय)
2. विद्यापति पदावली : संपादक रामवृक्ष बेनीपुरी से प्रारंभिक 10 पद।
3. कबीर ग्रंथावलीः संपादक डॉ. श्याम सुंदर दास (50 साखियाँ तथा 15 पद) पद क्रमांक– 11, 16, 24, 26, 27, 45, 49, 64, 70, 72, 89, 93, 110, 111, 268 साखियाँ– गुरूदेव कौ अंग 1 से 10, सुमिरण कौ अंग 1 से 10, विरह कौ अंग 1 से 10, ग्यान विरह कौ अंग 1 से 5, चितावणी कौ अंग 1 से 5, माया कौ अंग 1 से 5, परचा कौ अंग 1 से 5 ।
4. मलिक मोहम्मद जायसी : पद्मावत संपादक आ. रामचंद्र शुक्ल (नागमती विरह खण्ड एवं सिंहल द्वीपखण्ड)

टीपः– द्रुत पाठ हेतु निम्नांकित 05 कवियों का एवं उनकी रचनाओं का अध्ययन अनिवार्य है, इन कवियों पर लघुत्तरी प्रश्न पूछे जायेंगे– अमीर खुसरों, मीराबाई, रहीम, रैदास, रसखान ।

अंक विभाजन

प्रश्न 1 व्याख्या	3 व्याख्या (कोई तीन)	3X10 =	30 अंक
प्रश्न2 चंदबरदाई एवं इतिहास	3 आलोचनात्मक (कोई तीन)	3X10 =	30 अंक
प्रश्न3 कबीर एवं जायसी			
प्रश्न4 (द्रुत पाठ के कवि)	5 लघु– उतरीय (सम्पूर्ण पाठ्यक्रम से)	5X2 =	10 अंक
10 वस्तुनिष्ठ (सम्पूर्ण पाठ्यक्रम से)		10X1 =	10 अंक
	योग =		**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकेंः–

1. डॉ. विपिन बिहारी द्विवेदी – चंदबरदाई
2. कबीर की विचारधारा – डॉ. गोविन्द त्रिगुणायन
3. प्रमुख प्राचीन कवि – डॉ. द्वारिका प्रसाद सक्सेना
4. कबीर साहित्य की परख – परशुराम चतुर्वेदी
5. जायसी की विशिष्ट शब्दावली – डॉ. इंदिरा कुमारी सिंह का विश्लेशणात्मक अध्ययन
6 मलिक मोहम्मद जायसी और उनका काव्य – डॉ. शिवसहाय पाठक
7. अमीर खुसरों और उनका साहित्य – डॉ. भोलानाथ तिवारी
8. कबीर – सं. हजारी प्रसाद द्विवेदी

5/7/2021 डॉ आशा तिवारी (डॉ. खिमाराम शर्मा)

एम.ए. पूर्व (हिन्दी)
प्रथम सेमेस्टर
प्रश्न पत्र – तृतीय
आधुनिक काव्य–1
(द्विवेदीयुगीन एवं छायावादी काव्य)

कुल : 80

पाठ्य विषयः–

व्याख्या एवं विवेचन के लिए निम्नांकित तीन कवियों का अध्ययन अपेक्षित है ।

इकाई 1. मैथिलीशरण गुप्त – साकेत नवम् सर्ग
इकाई 2. जयशंकर प्रसाद – कामायनी (चिन्ता, श्रद्धा)
इकाई 3. सूर्यकांत त्रिपाठी निराला – राम की शक्ति पूजा, सरोज स्मृति
इकाई 4. महादेवी वर्मा – मैं नीर भरी दुःख की बदली, यह मंदिर का दीप इसे नीरव जलने दो, रूपसी तेरा केश-पाश, मधुर मधुर मेरे दीपक जल।

टीपः– द्रुत पाठ हेतु निम्नांकित 5 कवियों का अध्ययन किया जाएगा ।
श्रीधर पाठक, अयोध्या सिंह उपाध्याय ''हरिऔध'', मुकुटधर पांडेय, जगन्नाथ दास रत्नाकर, सुमित्रानन्दन पंत, (लघुत्तरीय प्रश्न द्रुत पाठ एवं पाठ्यक्रम से पूछे जाएंगे।)

अंक विभाजन

प्रश्न1–	3 व्याख्या	–	3X10	=	30 अंक
प्रश्न2–	3 आलोचनात्मक	–	3X10	=	30 अंक
प्रश्न3–	5 लघुत्तरीय (द्रुत पाठ के कवि)	–	5X2	=	10 अंक
प्रश्न4–	वस्तुनिष्ठ अतिलघुत्तरीय	–	10X1	=	10 अंक
			योग	**=**	**80 अंक**
			आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकेंः–

1. साकेत एक अध्ययन– डॉ. नगेन्द्र
2. कवि निराला – आचार्य नंद दुलारे वाजपेयी
3. निराला की साहित्य साधना – डॉ. रामविलास शर्मा
4. नया साहित्य नये साधना – आचार्य नंद दुलारे वाजपेयी
5. कामायनी एक पुनर्विचार – मुक्तिबोध
6. प्रसाद का काव्य – प्रेमशंकर
7. हिन्दी साहित्य आधुनिक परिदृश्य – अज्ञेय
8. हिन्दी साहित्य का इतिहास – नगेन्द्र
9. बच्चन की कविताओं का शैलीवैज्ञानिक अध्ययन – डॉ. शीला शर्मा

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
प्रथम सेमेस्टर
प्रश्न पत्र – चतुर्थ
आधुनिक गद्य साहित्य
(नाटक, एकांकी एवं चरितात्मक तथा आत्मकथात्मक कृति)

पूर्णांक : 80

पाठ्य विषय :–

इकाई –1. नाटक

1. चन्द्रगुप्त	–	जयशंकर प्रसाद
2. हानूश	–	भीष्म साहनी
3. अन्धा युग	–	धर्मवीर भारती

इकाई –2. एकांकी

1. रीढ़ की हड्डी	–	जगदीश चन्द्र माथुर
2. एक दिन	–	लक्ष्मीनारायण मिश्र
3. ताँबे के कीड़े	–	भुवनेश्वर
4. तौलिए	–	उपेन्द्रनाथ अश्क

इकाई – 3. चरितात्मक कृति

1. पथ के साथी	–	निराला भाई
2. आवारा मसीहा	–	विष्णु प्रभाकर (संक्षिप्त संस्करण)

इकाई – 4. आत्मकथात्मक कृति

1. जूठन (भाग–एक)–ओम प्रकाश बाल्मिकी

इकाई विभाजन

प्रश्न – 1 – व्याख्या
प्रश्न – 2 – नाटक
प्रश्न – 3 – एकांकी
प्रश्न –4 – चरितात्मक कृति, आत्मकथात्मक कृति
प्रश्न –5 – लघुउत्तरीय एवं वस्तुनिष्ठ प्रश्न

अंक विभाजन

1– 3 व्याख्या	–	3X10	=	30 अंक
2– 3 आलोचनात्क	–	3X10	=	30 अंक
3– 5 लघुत्तरी	–	5X2	=	10 अंक
4– वस्तुनिष्ठ अतिलघुउत्तरीय	–	10X1	=	10 अंक
		योग	**=**	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

5/7/2021 डॉ आशा दीवान (डॉ. विभाराम शर्मा)

निर्धारित पुस्तकें:–

1.	हिन्दी नाटक उद्‌भव और विकास	–	डॉ. दशरथ ओझा
2.	हिन्दी नाटक सिद्धांत और विवेचन	–	डॉ. गिरीश रस्तोगी
3.	हिन्दी नाटक पुनर्मूल्यांकन	–	डॉ. सत्येन्द्र तनेजा
4.	समसामयिक हिन्दी नाटकों में चरित्र सृष्टि	–	डॉ. जयदेव तनेजा
5.	प्रसाद के नाटकों का शास्त्रीय अध्ययन	–	जगन्नाथ प्रसाद शर्मा
6.	आधुनिक हिन्दी नाटक	–	नगेन्द्र
7.	नाटक रंगमंच और मोहन राकेश	–	डॉ. सुरेन्द्र यादव
8.	प्रसाद युगीन हिन्दी नाटक	–	डॉ. भगवती प्रसाद शुक्ल
9.	प्रसाद के नाटक एवं नाट्य शिल्प	–	डॉ. शांति स्वरूप गुप्त
10.	नाटककार मोहन राकेश	–	डॉ. सुन्दर लाल कथूरिया
11.	हिन्दी एकांकी : उद्‌भव और विकास	–	रामचरण महेन्द
12.	हिन्दी रंगमंच : दषा और दिषा	–	जयदेव तनेजा
13.	भष्म साहनी के उपन्यास और नाटक	–	डॉ. राकेश कुमार तिवारी

5/7/2021 डॉ आशा तिवारी (डॉ. खिमाराम शर्मा)

एम. ए. (हिन्दी)
द्वितीय सेमेस्टर
प्रश्न पत्र – पंचम (उत्तर मध्यकाल से आधुनिक काल तक)

समय 3 घंटे **पूर्णांक : 80**

पाठ्य विषयः–

इकाई 1. उत्तर मध्यकाल (रीतिकाल) काल सीमा, नामकरण, प्रवृत्तियॉ, रीतिकालीन साहित्य की विभिन्न धारायें (रीतिबद्ध, रीतिसिद्ध, रीतिमुक्त) प्रवृत्तियॉ एवं विशेषताएं। रीतिकाल के प्रतिनिधि रचनाकार एवं रचनाएँ ।

इकाई 2. आधुनिक काल – आधुनिक काल की सामाजिक, राजनैतिक, आर्थिक एवं सांस्कृतिक पृष्ठभूमि । सन् 1857 की राज्य क्रांति एवं पुनर्जागरण, भारतेन्दु युग और हिन्दी नवजागरण – प्रमुख साहित्यकार, साहित्य एवं साहित्यिक विषेशताएँ ।

इकाई 3. द्विवेदी युग – प्रमुख साहित्यकार एवं साहित्यिक विषेशताएँ, छायावाद– नामकरण और प्रवृत्तियॉ, प्रमुख साहित्याकार, साहित्यिक विषेशताएँ। छायावादोत्तर काल (विभिन्न प्रवृत्तियॉ) प्रगतिवाद, नई कविता, नवगीतवाद तथा समकालीन कविता, स्वच्छन्दतावाद सामान्य परिचय ।

इकाई 4. हिन्दी गद्य का विकास – आधुनिक काल, गद्य साहित्य के विभिन्न रूपों का उद्भव और विकास, उपन्यास व कहानी का विकास और सामान्य प्रवृत्तियॉ, निबंध का विकास और प्रवृत्तियॉ, नाटक का उद्भव और विकास – सामान्य प्रवृत्तियॉ, गीति – नाटकों का परिचयात्मक विवेचन ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 2	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 3	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 4	(दीर्घ उत्तरीय)	–	1X 15	= 15 अंक
प्रश्न 5	लघुत्तरीय	–	5X 2	= 10 अंक
प्रश्न 6	वस्तुनिष्ठ	–	10X 1	= 10 अंक
			योग	**= 80 अंक**
			आंतरिक मूल्यांकन	**20 अंक**

5/7/2021 डॉ आशा तिवारी (डॉ. खिमाराम शर्मा)

निर्धारित पुस्तकें :–

1. आधुनिक साहित्य की प्रवृत्तियॉ – डॉ. नामवर सिंह
2. हिन्दी साहित्य बीसवीं शताब्दी – नन्ददुलारे वाजपेयी
3. आधुनिक हिन्दी साहित्य का इतिहास – कृष्ण शंकर शुक्ल
4. गद्य की विविध विधाएँ – डॉ. बापूराव देसाई
5. हिन्दी कहानी – उद्भव और विकास – डॉ. सुरेश सिन्हा
6. हिन्दी उपन्यास की प्रवृत्तियॉ – डॉ. शशि भूषण सिंह
7. हिन्दी नाटक उद्भव और विकास – डॉ. दशरथ ओझा
8. हिन्दी साहित्य का इतिहास – आचार्य रामचन्द्र शुक्ल
9. हिन्दी साहित्य का उद्भव और विकास – आचार्य हजारी प्रसाद द्विवेदी
10. हिन्दी साहित्य की भूमिका – आचार्य हजारी प्रसाद द्विवेदी

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

एम.ए. (हिन्दी)
द्वितीय सेमेस्टर
प्रश्न पत्र –षष्ठ
मध्यकालीन काव्य

समय 3 घंटे **पूर्णांक : 80**

पाठ्य विषय :– व्याख्या एवं विवेचन के लिए निम्नांकित तीन कवियों का अध्ययन किया जाएगा।

इकाई –1. सूरदास –भ्रमरगीत सार – संपादक आचार्य रामचंद्र शुक्ल (50 पद) पद संख्या – 1 से 10, 21 से 30, 51 से 60, 61 से 70, 81 से 90 तक (50 पद)

इकाई – 2. तुलसीदास –रामचरित मानस (सुंदरकाण्ड) गीताप्रेस गोरखपुर

इकाई – 3. बिहारी –बिहारी रत्नाकर संपादक जगन्नाथ दास रत्नाकर (प्रारंभिक 100 दोहे)

इकाई – 4. द्रुत पाठ हेतु निम्नांकित 5 कवियों एवं उनकी रचनाओं का (विषय एवं शिल्पगत) ज्ञान अपेक्षित है केशव, भूषण, पद्माकर, देव, घनानंद

इन कवियों पर लघुत्तरीय प्रश्न पूछे जाएंगे ।

अंक विभाजन

प्रश्न 1	व्याख्या	3 व्याख्या	3X10	=	30 अंक
प्रश्न 2	सूरदास, तुलसीदास	आलोचनात्मक	3X10	=	30 अंक
		3			
प्रश्न 3	बिहारी एवं इतिहास विषयक	प्रश्न			
प्रश्न 4	द्रुत पाठ के कवि	5 लघुत्तरी	5X2	=	10 अंक
प्रश्न 5	वस्तुनिष्ठ प्रश्न (संपूर्ण पाठ्यक्रम से)	10 वस्तुनिष्ठ अतिलघुत्तरीय	10X1	=	10 अंक
			योग	**=**	**80 अंक**
		आंतरिक मूल्यांकन			**20 अंक**

निर्धारित पुस्तकें :–

1. बिहारी– डॉ. विश्वनाथ प्रसाद मिश्र
2. तुलसीदास और उनका युग संदर्भ – डॉ. भगीरथ मिश्र
3. सूरदास के काव्य का मूल्यांकन – डॉ. रामरतन भटनागर
4. तुलसी साहित्य के नये संदर्भ – डॉ. एल.एन.दुबे
5. सूरदास – डॉ. हरबंस लाल वर्मा
6. तुलसीदास – प्रो. सतीश कुमार अशोक प्रकाशन नई दिल्ली
7. सूरदास – मैनेजर पाण्डेय

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
द्वितीय सेमेस्टर प्रश्न पत्र – सप्तम
आधुनिक काव्य–2
(प्रगतिवाद, प्रयोगवाद, नई कविता एवं समकालीन कविता)

कुल अंक : 80

पाठ्य विषय –

स.ही.वात्स्यायन अज्ञेय	–	नदी के द्वीप, असाध्यवीणा, बावरा अहेरी, कलगी बाजरे की, यह दीप अकेला, उधार, देह वल्ली, सोन मछली
ग.मा. मुक्तिबोध	–	कविता – अंधेरे में ।
नागार्जुन	–	बसन्त की अगवानी,यह तुम थी, कोयल आज बोली है, शासन की बंदूक, सिन्दूर तिलकित भाल, अकाल और उसके बाद, बादल को घिरते देखा।
रघुवीर सहाय	–	रामदास, मेरा जीवन, हंसो–हंसो जल्दी हंसों, पानी–पानी
केदार सिंह	–	जो एक स्त्री को जानता है, बुराई का गीत, विद्रोह, सृष्टि पर पहरा, टूटा हुआ ट्रक

द्रुत पाठ हेतु निम्नांकित 5 कवियों का अध्ययन किया जायेगा।

केदारनाथ अग्रवाल, त्रिलोचन शास्त्री, भवानी प्रसाद मिश्र, विनोद कुमार शुक्ल, धूमिल, आलोक धन्वा एवं राजेश जोशी (लघुत्तरी प्रश्न द्रुत पाठ एवं सम्पूर्ण पाठ्यक्रम से पूछे जायेंगे)

अंक विभाजन

प्रश्न 1. 3 व्याख्या	–	3X10	=	30 अंक
प्रश्न 2. 3 आलोचनात्मक	–	3X10	=	30 अंक
प्रश्न 3. 5 लघुत्तरीय	–	5X2	=	10 अंक
प्रश्न 4. 10 वस्तुनिष्ठ अतिलघुत्तरीय	–	10X1	=	10 अंक
		योग	=	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें :–

1. मुक्तिबोध की काव्य प्रक्रिया – अशोक चक्रधर
2. अज्ञेय का रचना संसार – डॉ. रामस्वरूप चतुर्वेदी
3. कविता की तीसरी आंख – डॉ. प्रभाकर श्रोत्रिय
4. कविता से साक्षात्कार – मलयज
5. हिन्दी साहित्य का इतिहास – डॉ. रामचन्द्र शुक्ल
6. कविता की संगत – विजय कुमार
7. कविता का अर्थात्– परमानंद श्रीवास्तव
8. नागार्जुन का रचना संसार – विजय बहादुर सिंह

5/7/2021 डॉ आशा दीवान (डॉ. विश्राम शर्मा)

9. छायावादोत्तर प्रबंध काव्यों में ऐतिहासिक, सांस्कृतिक एवं दार्शनिक तत्वों का अनुशीलन – डॉ. ज्योति पाण्डेय
10. छायावादोत्तर काव्यों की विभिन्न प्रवृत्तियों एवं उनका चैन्तनिक पक्ष – डॉ. ज्योति पाण्डेय
11. केदारनाथ सिंह की कविता – बिम्ब से आख्यान तक – गोविंद प्रसाद, नेहा पब्लिशर
12. कवि केदारनाथ सिंह– सम्पादक भारत यायावर, वाणी प्रकाशन, दिल्ली
13. कविता की संगत – विजय कुमार, आधार प्रकाशन पंचकूला

5/7/2021

डॉ आशा तिवारी

(डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
द्वितीय सेमेस्टर प्रश्न पत्र – अष्टम
आधुनिक गद्य साहित्य (उपन्यास, निबंध एवं कहानी)

पाठ्य विषयः– **पूर्णांक : 80**

उपन्यास	–	1. गोदान	– प्रेमचंद
		2. बाणभट्ट की आत्मकथा	– हजारी प्रसाद द्विवेदी
		3. सूखा बरगद	– मंजूर एहतेशाम
निबंध	–	1. चढ़ती उमर	– बालकृष्ण भट्ट
		2. कविता क्या है?	– रामचंद्र शुक्ल
		3. माटी की मूरतें	– रामवृक्ष बेनीपुरी
		4. चन्द्रमा मनसो जातः	– विद्यानिवास मिश्र
		5. वैष्णव की फिसलन	– हरिशंकर परसाई
कहानी	–	1. उसने कहा था	– चन्द्रधर शर्मा गुलेरी
		2. पुरस्कार	– जयशंकर प्रसाद
		3. सूखा बरगद	– मंजूर एहतेशाम
		3. शतरंज के खिलाड़ी	– प्रेमचंद
		4. वापसी	– उषा प्रियम्वदा
		5. डिप्टी कलक्टरी	– अमरकांत

अंक विभाजन

प्रश्न 1. 3 व्याख्या	–	3X10	=	30 अंक
प्रश्न 2. 3 आलोचनात्मक प्रश्न	–	3X10	=	30 अंक
प्रश्न 3. 5 लघुत्तरीय प्रश्न	–	5X2	=	30 अंक
प्रश्न 4. 10 वस्तुनिश्ठ प्रश्न	–	10X1	=	10 अंक
		योग	=	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1.	प्रेमचंद और उनका युग	–	रामविलास शर्मा
2.	गोदान के अध्ययन की समस्याएं	–	डॉ. गोपाल राय
3.	कथाकार फणीश्वरनाथ रेणु	–	चंद्रभाव सोनवठी
4.	हिन्दी उपन्यास की शिल्पविधि का विकास	–	सिद्धनाथ तनेजा
5.	हिन्दी उपन्यास उद्भव और विकास	–	सुरेश सिन्हा
6.	प्रेमचंद : एक अध्ययन	–	राजेश्वर गुरू
7.	महादेवी प्रतिनिधि गद्य रचनाएं	–	सं. रामजी पाण्डेय
8.	हिन्दी निंबध के आधार स्तम्भ	–	डॉ. हरिमोहन
9.	हिन्दी कहानी : उद्भव और विकास	–	सुरेश सिन्हा
10.	कहानी : स्वरूप और संवेदना	–	राजेन्द्र यादव
11.	कहानी : नयी कहानी	–	नामवर सिंह
12.	हजारी प्रसाद द्विवेदी	–	सं. विश्वनाथ तिवारी
13.	प्रेमचंद का जीवनदर्शन एवं रंगभूमि	–	डॉ. शंकर बुन्देले

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
तृतीय सेमेस्टर प्रश्न पत्र – प्रथम
साहित्य के सिद्धांत तथा आलोचना शास्त्र

पूर्णांक : 80

पाठ्य विषयः–

इकाई–1 भारतीय काव्य शास्त्र
काव्य लक्षण, काव्य हेतु, काव्य प्रयोजन और काव्य के प्रकार
रस सिद्धांत, रस का स्वरूप, रस निष्पत्ति और साधारणीकरण, रस के अंग ।

इकाई–2 अलंकार सिद्धांत रीति सिद्धांत, वक्रोक्ति सिद्धांत, ध्वनि सिद्धांत और औचित्य सिद्धांत

इकाई–3 पाश्चात्य काव्य शास्त्र प्लेटो – काव्य सिद्धांत अरस्तू– अनुकरण का सिद्धांत, विरेचन सिद्धांत, लोंजाइनस–उदात्त की अवधारणा

इकाई–4 मैथ्यू आर्नल्ड– कला की अवधारणा टी.एस. इलियट – कला की निर्वैयक्तिकता, कॉलरिज–कल्पना सिद्धांत, क्रिस्टोफर कॉडवेल – कविता संबंधी विचार

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1	–	1X 15	=	15 अंक
प्रश्न 2	–	1X 15	=	15 अंक
प्रश्न 3	–	1X 15	=	15 अंक
प्रश्न 4	–	1X 15	=	15 अंक
प्रश्न 5	– लघुत्तरीय	5X 2	=	10 अंक
प्रश्न 6	– वस्तुनिष्ठ	10X1	=	10 अंक
		योग	**=**	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

1. डॉ. गणपति चन्द्रगुप्त – भारतीय एवं पाश्चात्य काव्य सिद्धांत
2. डॉ. भगीरथ मिश्र – पाश्चात्य काव्य शास्त्र, इतिहास, सिद्धांत एवं वाद
3. डॉ. राममूर्ति त्रिपाठी– भारतीय काव्य शास्त्र के नये क्षितिज
4. डॉ. शिवकुमार मिश्र– मार्क्सवादी साहित्य के सिद्धांत
5. डॉ. नगेन्द्र – भारतीय काव्य शास्त्र की भूमिका
6. डॉ. निर्मला जैन – पाश्चात्य साहित्य चिंतन
7. मुलजी भाई– भारतीय और पाश्चात्य काव्य शास्त्र
8. डॉ. गंगा प्रसाद विमल – आधुनिकता, साहित्य के संदर्भ में ।
9. क्रिस्टोफर कॉडवेल – विभ्रम और यथार्थ, राजकमल प्रकाशन।
10. नामवर सिंह – आधुनिक हिन्दी उपन्यास खण्ड 2, राजकमल प्रकाशन , दिल्ली

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
तृतीय सेमेस्टर प्रश्न पत्र – द्वितीय (भाषा विज्ञान)

पूर्णांक : 80

पाठ्य विषयः–

इकाई –1 भाषा और भाषा विज्ञान, भाषा की परिभाषा और अभिलक्षण, भाषा व्यवस्था और भाषा व्यवहार, भाषा संरचना, भाषा विज्ञान स्वरूप एवं व्याप्ति, अध्ययन की दिशाएँ–वर्णनात्मक, ऐतिहासिक और तुलनात्मक ।

इकाई –2 स्वन प्रक्रिया : स्वन विज्ञान का स्वरूप और शाखाएँ, वागवयव और उनके कार्य, स्वन की अवधारणा और स्वनों का वर्गीकरण, स्वन गुण, स्वनिक परिवर्तन। स्वनिम विज्ञान का स्वरूप, स्वनिम की अवधारणा, स्वनिम के भेद ।

इकाई –3 व्याकरण : रूप विज्ञान का स्वरूप और शाखाएँ, रूपिम की अवधारणा और भेद, मुक्त – आबद्ध अर्थदर्शी और संबंधदर्शी रूपिम और शाखाएँ, रूपिम के भेद और प्रकार्य। वाक्य के भेद, वाक्य–विश्लेशण, निकटस्थ अवयव विश्लेषण ।

इकाई –4 अर्थ विज्ञान : अर्थ की अवधारणा, शब्द और अर्थ का संबंध, पर्यायता, अनेकार्थता, विलोमता अर्थ परिवर्तन।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 –	5X 2	=	10 अंक
प्रश्न 6 –	10X 1	=	10 अंक
	योग	=	**80 अंक**
आंतरिक मूल्यांकन			**20 अंक**

निर्धारित पुस्तकेंः–

1. सामान्य भाषा विज्ञान– डॉ. बाबूराम सक्सेना
2. भाषा विज्ञान – डॉ. भोलानाथ तिवारी
3. भारत के भाषा परिवार – डॉ. रामनिवास शर्मा
4. भाषाशास्त्र की रूपरेखा – उदयनारायण तिवारी
5. हिन्दी शब्दानुशासन – किशोरी दास बाजपेयी
6. भाषा विज्ञान और भाषा शास्त्र – कपिलदेव द्विवेदी
7. सामान्य भाषाविज्ञान – बाबूराम सक्सेना
8. हिन्दी और उसका संक्षिप्त इतिहास – भोलानाथ तिवारी
9. हिन्दी और उसकी विविध बोलियॉ – प्रो. दीपचंद जैन
10. भाषा विज्ञान के सिद्धांत और हिन्दी भाषा – द्वारिका प्रसाद मिश्र

5/7/2021 डॉ आशा तिवारी (डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
तृतीय सेमेस्टर प्रश्न पत्र – तृतीय
(कामकाजी हिन्दी एवं पत्रकारिता)

पाठ्य विषयः– **पूर्णांक : 80**

इकाई–1 हिन्दी के विभिन्न रूप – सर्जनात्मक भाषा, संचार भाषा, राजभाषा, माध्यम भाषा, कार्यालयीन हिन्दी (राजभाषा) के प्रमुख प्रकार्य– प्रारूपण, पत्र लेखन, संक्षेपण, पल्लवन, टिप्पणी ।

इकाई–2 पारिभाषिक शब्दावली, स्वरूप एवं महत्व, पारिभाषिक शब्दावली निर्माण के सिद्धांत, ज्ञान–विज्ञान के विभिन्न क्षेत्रों की पारिभाषिक शब्दावली। हिन्दी कम्प्यूटर– कम्प्यूटर परिचय, उपयोगिता क्षेत्र, वेब पेज पब्लिशिंग परिचय।

इकाई–3 इंटरनेट संपर्क उपकरणों का परिचय, प्रकार्यात्मक रख–रखाव एवं इंटरनेट समय मितव्यतता के सूत्र । इंटरनेट एक्सप्लोइट अथवा नेट स्केप । हिन्दी साफ्टवेयर पैकेज ।

इकाई–4 पत्रकारिता का स्वरूप एवं प्रकार, हिंदी पत्रकारिता का संक्षिप्त इतिहास । समाचार लेखन कला, संपादन के आधारभूत तत्व, व्यवहारिक प्रूफशोधन, शीर्शक संरचना, लीड, इंट्रो एवं शीर्षक, संपादकीय लेखन, पृष्ठ सज्जा, साक्षात्कार, पत्रकारवार्ता एवं प्रेस प्रबंधन, प्रमुख प्रेस कानून एवं आचार संहिता ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 –	5X 2	=	10 अंक
प्रश्न 6 –	10X 1	=	10 अंक
	योग	**=**	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकेंः–

1. प्रयोजन परक हिन्दी – प्रो. सूर्यप्रसाद दीक्षित
2. प्रशासनिक हिन्दी – पुष्पा कुमारी, क्लासिक पब्लिक कम्पनी
3. पत्रकारिता के छह दशक – जगदीष प्रसाद चतुर्वेदी
4. हिन्दी पत्रकारिता का प्रतिनिधि संकलन – तरूशिखा सुरजन, राजकमल प्रकाशन,नई दिल्ली
5. हिन्दी पत्रकारिता – कृष्ण बिहारी मिश्र
6. भारतीय समाचार पत्रों का संगठन एवं प्रबंधन – डॉ. सुकुमार जैन
7. पत्रकारिता का इतिहास एवं जनसंचार माध्यम – डॉ. संजीव भनावत
8. कम्प्यूटर के भाषिक अनुप्रयोग – विजय मल्होत्रा
9. कम्प्यूटर एप्लीकेशन – गौरव अग्रवाल

5/7/2021 डॉ आशा तिवारी (डॉ. खिमाराम शर्मा)

एम. ए. – (हिन्दी साहित्य)
तृतीय सेमेस्टर प्रश्न पत्र – चतुर्थ
भारतीय साहित्य

पूर्णांक : 80

पाठ्य विषय :–

इकाई–1 भारतीय साहित्य का स्वरूप, भारतीय साहित्य के अध्ययन की समस्याएँ, भारतीय साहित्य में आज के भारत का बिम्ब, हिन्दी साहित्य में भारतीय मूल्यों की अभिव्यक्ति ।

इकाई–2 हिन्दीतर साहित्य का इतिहास जो तीन वर्गों में विभक्त है –

1. दक्षिणात्य भाषा वर्ग से मलयालम
2. पूर्वांचल भाषा वर्ग में बँगला
3. पश्चिमोत्तर भाषा वर्ग में मराठी

प्रत्येक विद्यार्थी इन तीनों विकल्पों में से एक भाषा चयन करेंगे बशर्ते वह भाषा अपनी क्षेत्रीय भाषा से भिन्न भाषा वाले वर्ग से संबंधित हो। विद्यार्थी एक भाषा वर्ग (मलयालम, बंगला, मराठी) में से किसी एक के इतिहास एवं हिन्दी भाषा साहित्य से उस भाषा साहित्य का तुलनात्मक अध्ययन करेंगे।

इकाई–3 उपन्यास – अग्निगर्भ (बंगला– महाश्वेता देवी)

इकाई– 4 नाटक – हयवदन (कन्नड़–गिरीशकर्नाड)

कविता संग्रह – कोच्चि के दरख्त (मलयालम– के.जी. शंकर पिल्लै)

इकाई तीन तथा चार के अंतर्गत केवल आलोचनात्मक प्रश्न पूछे जाएँगे ।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15	अंक
प्रश्न 2 –	1X 15	=	15	अंक
प्रश्न 3 –	1X 15	=	15	अंक
प्रश्न 4 –	1X 15	=	15	अंक
प्रश्न 5 –	5X 2	=	10	अंक
प्रश्न 6 –	10X 1	=	10	अंक
	योग	=	**80**	**अंक**
	आंतरिक मूल्यांकन		**20**	**अंक**

निर्धारित पुस्तकें :–

1. मलयालम साहित्य – परख और पहचान – प्रो. आर. सुरेन्द्रन ।
2. राष्ट्रीय चेतना और मलयालम साहित्य – प्रो. आर. सुरेन्द्रन ।
3. मराठी भाषा और साहित्य – राजमल वोरा
4. मलयालम साहित्यकारों से साक्षात्कार – प्रो. आर. सुरेन्द्रन ।
5. बंगला भाषा और साहित्य का इतिहास – भारतीय भाषा संस्थान, इलाहाबाद
6. भारतीय साहित्य – डॉ. नगेन्द्र
7. भारतीय साहित्य रत्नमाला – सं.कृष्णदयाल भार्गव
8. भारतीय साहित्य के इतिहास की समस्याएँ – डॉ. रामविलास शर्मा
9. भारतीय भाषाओं के साहित्य का इतिहास – केन्द्रीय हिन्दी निर्देशालय, दिल्ली ।
10. भारतीय साहित्य : अवधारणा, समन्वय एवं सादृश्यता– जगदीश गुप्त

5/7/2021 डॉ आशा दीवान (डॉ. विभाराम शर्मा)

एम.ए. – (हिन्दी)
चतुर्थ सेमेस्टर
प्रश्न पत्र – पंचम
(हिन्दी आलोचना तथा समीक्षा शास्त्र)

पूर्णांक : 80

पाठ्य विषयः–

इकाई 1 मनोविश्लेशण वाद, अस्तित्ववाद, अभिजात्यवाद, स्वच्छंदतावाद, अभिव्यंजनावाद, मार्क्सवाद, आधुनिक समीक्षा की विशिष्ट प्रवृत्तियॉ, संरचनावाद, शैलीविज्ञान, उत्तर आधुनिकता

इकाई 2 हिन्दी कवि आचार्यों का काव्य शास्त्रीय चिंतन– लक्षण काव्य परम्परा – आचार्य रामचन्द्र शुक्ल, आचार्य नंददुलारे वाजपेयी, डॉ. रामविलास शर्मा, नामवर सिंह

इकाई 3 आधुनिक हिन्दी आलोचना का विकास एवं उसकी प्रमुख प्रवृत्तियॉ–शास्त्रीय, ऐतिहासिक, मनोविश्लेषणवादी, सौंदर्य शास्त्रीय, मार्क्सवादी, शैली वैज्ञानिक

इकाई 4 व्यावहारिक समीक्षा : काव्यांश की स्वविवेक के अनुसार व्याख्या
त्रिलोचन, मुक्तिबोध, सर्वेश्वर दयाल सक्सेना, श्रीकांत वर्मा, अरूण कमल, विनोद कुमार शुक्ल

अंक विभाजन

प्रश्न 1 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 2 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 3 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 4 – (दीर्घ उत्तरीय)	1X 15	=	15 अंक
प्रश्न 5 – लघुत्तरीय	5X2	=	10 अंक
प्रश्न 6 – वस्तुनिष्ठ	10X 1	=	10 अंक
	योग	**=**	**80 अंक**
आंतरिक मूल्यांकन			**20 अंक**

निर्धारित पुस्तकें :–

1. डॉ. गोविंद त्रिगुणायत –शास्त्रीय समीक्षा के सिद्धांत भाग 1 एवं 2
2. डॉ. भगवत स्वरूप मिश्र – हिन्दी आलोचना : उद्‌भव और विकास
3. डॉ. रामेश्वर खण्डेलवाल – हिन्दी आलोचना के आधार स्तम्भ
4. डॉ. शिवकरण सिंह – आलोचना के बदलते मानदण्ड और हिन्दी साहित्य
5. डॉ. नंदकिशोर नवल – हिन्दी आलोचना का विकास
6. योगेन्द्र शाही – अस्तित्ववाद किर्कगार्द से कामू तक
7. रणधीर सिन्हा – आलोचनात्मक रामविलास शर्मा
8. नामवर सिंह – आलोचना की दूसरी परम्परा, सम्पादक कमला प्रसाद, वाणी प्रकाशन नई दिल्ली
9. कविता की संगत – विजय कुमार, आधार प्रकाशन पंचकूला
10. हिन्दी आलोचना का इतिहास– नन्द किशोर नवल, राजकमल प्रकाशन

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
चतुर्थ सेमेस्टर प्रश्न पत्र –षष्ठ
(हिन्दी भाषा)

पूर्णांक : 80

पाठ्य विषयः–

इकाई–1 हिन्दी की ऐतिहासिक पृष्ठभूमि : प्राचीन भारतीय आर्य भाशाएँ – वैदिक तथा लौकिक संस्कृत और उनकी विषेशताएँ । मध्यकालीन भारतीय आर्यभाषाएँ – पालि, प्राकृत, शौरसेनी, अर्धमागधी, मागधी, अपभ्रंश और उनकी विशेषताएँ । आधुनिक भारतीय भाषाएँ और उनका वर्गीकरण ।

इकाई–2 हिन्दी का भौगोलिक विस्तार – हिन्दी की उपभाषाएँ, पश्चिमी हिन्दी, पूर्वी हिन्दी, राजस्थानी, बिहारी तथा पहाड़ी और उनकी बोलियॉ। खड़ी बोली, ब्रज और अवधी की विशेषताएँ।

इकाई–3 हिन्दी के विविध रूप– संपर्क भाषा, राष्ट्रभाषा, राजभाषा के रूप में हिन्दी, माध्यम भाषा, संचार भाषा, हिन्दी की संवैधानिक स्थिति ।

इकाई–4 हिन्दी में कम्प्यूटर सुविधाएँ – आंकड़ा संसाधन और शब्द संसाधन, वर्तनी शोधक, मशीनी अनुवाद, हिन्दी भाष शिक्षण । देवनागरी लिपि : विशेषताएँ और मानकीकरण ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –		1X 15	=	15 अंक
प्रश्न 2 –		1X 15	=	15 अंक
प्रश्न 3 –		1X 15	=	15 अंक
प्रश्न 4 –		1X 15	=	15 अंक
प्रश्न 5 –	लघुत्तरीय	5X 2	=	10 अंक
प्रश्न 6 –	वस्तुनिष्ठ	10X 1	=	10 अंक
		योग	**=**	**80 अंक**
	आंतरिक मूल्यांकन			**20 अंक**

निर्धारित पुस्तकेंः–

1. हिन्दी भाषा का संक्षिप्त इतिहास – भोलानाथ तिवारी
2. हिन्दी और उसकी विविध बोलियॉ – प्रो. दीपचंद जैन
3. भाषा भूगोल – कैलाशचंद भटिया हिन्दी समिति उ.प्र. शासन लखनऊ
4. हिन्दी भाषा की रूप संरचना – भोलानाथ तिवारी
5. राष्ट्रभाषा हिन्दी समस्याएँ और समाधान – देवेन्द्रनाथ शर्मा
6. नागरी लिपि और हिन्दी – अनंत चौधरी
7. सामान्य भाषा विज्ञान – डॉ. बाबूराम सक्सेना
8. भाषा विज्ञान – डॉ. भोलानाथ तिवारी

5/7/2021 डॉ आशा तिवारी (डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
चतुर्थ सेमेस्टर
प्रश्न पत्र – सप्तम
(मीडिया–लेखन एवं अनुवाद)

पूर्णांक : 80

पाठ्य विषयः–

इकाई–1 मीडिया लेखन जनसंचार : प्रौद्योगिक एवं चुनौतियॉ, विभिन्न जनसंचार–माध्यमों का स्वरूप– मुद्रण, श्रवण, दृश्य–श्रव्य, इंटरनेट, श्रवण–माध्यम (रेडियो), मौखिक भाषा की प्रकृति । समाचार लेखन एवं वाचन, रेडियो नाटक, उद्घोषणा लेखन, विज्ञापन–लेखन, फीचर तथा रिपोर्ताज ।

इकाई–2 दृश्य–श्रव्य माध्यम (फिल्म, टेलीविजन एवं रेडियो), दृश्य–माध्यमों में भाषा की प्रकृति, दृश्य एवं श्रव्य सामग्री का सामंजस्य, पार्श्व वाचन (वॉयस ओवर) पटकथा–लेखन, टेली–ड्रामा, संवाद–लेखन, साहित्य की विधाओं का दृश्य माध्यमों में रूपान्तरण, विज्ञापन की भाषा ।

इकाई–3 अनुवाद – सिद्धांत एवं व्यवहार अनुवाद का स्वरूप, क्षेत्र, प्रक्रिया एवं प्रविधि । हिन्दी की प्रयोजनीयता में अनुवाद की भूमिका । कार्यालयीन हिन्दी और अनुवाद, जनसंचार माध्यमों का अनुवाद, विज्ञापन में अनुवाद, वैचारिक साहित्य का अनुवाद, वाणिज्यिक अनुवाद, वैज्ञानिक तकनीकी तथा प्रौद्योगिकी क्षेत्रों में अनुवाद, विधि साहित्य की हिन्दी और अनुवाद।

इकाई–4 व्यावहारिक अनुवाद अभ्यास, कार्यालयीन अनुवाद, कार्यालयीन एवं प्रशासनिक शब्दावली, प्रशासनिक प्रयुक्तियॉ, पदनाम, विभाग, आदि पत्रों के अनुवाद, पदनामों–अनुभागों–दस्तावेजों–प्रतिवेदनों के अनुवाद, साहित्यिक अनुवाद के सिद्धांत एवं व्यवहार–कविता, कहानी, नाटक, सारानुवाद, दुभाषिया–प्रविधि ।

टीप :– प्रत्येक इकाई से 02 दीर्घ उत्तरीय प्रश्न पूछे जाएंगे जिनमें से 01 प्रश्न को हल करना होगा। प्रत्येक इकाई से 02 लघु उत्तरीय प्रश्न पूछे जाएंगे। कुल 8 लघु उत्तरीय प्रश्नों में से 5 प्रश्नों को हल करना होगा। सम्पूर्ण पाठ्यक्रम से पूछे गए 15 प्रश्नों में से 10 अति लघुउत्तरीय/वस्तुनिष्ठ प्रश्नों के उत्तर देने होंगे।

अंक विभाजन

प्रश्न 1 –	1X 15	=	15 अंक
प्रश्न 2 –	1X 15	=	15 अंक
प्रश्न 3 –	1X 15	=	15 अंक
प्रश्न 4 –	1X 15	=	15 अंक
प्रश्न 5 –	5X 2	=	10 अंक (पांच लघुत्तरीय)
प्रश्न 6 –	10X 1	=	10 (दस वस्तुनिष्ठ)
	योग	=	**80 अंक**
	आंतरिक मूल्यांकन		**20 अंक**

5/7/2021 डॉ आशा तिवारी (डॉ. विश्राम शर्मा)

निर्धारित पुस्तकें:–

1. जनसंचार माध्यमों में हिन्दी – डॉ. चन्द्रकुमार (क्लासिकल पब्लिक कंपनी)
2. जनमाध्यम एवं पत्रकारिता – प्रवीण दीक्षित (सहयोगी साहित्य संस्थान)
3. पत्रकारिता का इतिहास एवं जनसंचार माध्यम– डॉ. संजीव भागवन्त (उ.प्र. जयपुर)
4. पत्रकारिता के विविध आयाम – वेदप्रताप वैदिक
5. दूरदर्शन : हिन्दी के प्रयोनमूलक विविध प्रयोग : डॉ. कृष्णकुमार रत्तू (मीनाक्षी प्रकाशन, जयपुर)
6. जनमाध्यम एवं पत्रकारिता – प्रवीण दीक्षित (सहयोगी साहित्य संस्थान)
7. अनुवाद के सिद्धांत – सुरेश कुमार
8. अनुवाद सिद्धांत की रूपरेखा – सुरेश कुमार
9. अनुवाद – बोध – डॉ. गार्गी गुप्त (भारतीय अनुवाद परिषद् दिल्ली)

5/7/2021

(डॉ. खिमाराम शर्मा)

एम.ए. – (हिन्दी)
चतुर्थ सेमेस्टर प्रश्न पत्र – अष्टम
जनपदीय भाषा और साहित्य (छत्तीसगढ़ी)

पूर्णांक : 80

पाठ्य विषय :–

इकाई–1 छत्तीसगढ़ी भाषा–भौगोलिक सीमा, नामकरण, भाषिक स्वरूप एवं व्याकरणिक विशेषताएँ।

इकाई–2 छत्तीसगढ़ी साहित्य की युग प्रवृत्तियॉ एवं इतिहास ।

इकाई–3 छत्तीसगढ़ी कविता एवं कवि –

(1) सुंदरलालशर्मा
(2) मुकुटधर पाण्डेय
(3) हरि ठाकुर
(4) डॉ. नरेन्द्र देव वर्मा

इकाई–4 छत्तीसगढ़ी नाटक एवं उपन्यास

1. करमछड़हा (नाटक) – डॉ. खूबचंद बघेल
2. आवा (उपन्यास) – परदेशीराम वर्मा

द्रुतपाठ हेतु निम्नलिखित रचनाकार का अध्ययन (पांच लघुत्तरीय प्रश्न पूछे जायेंगे)

(1) लखन लाल गुप्त (2) लक्ष्मण मस्तुरिहा
(3) केयूर भूषण (4) मुकुन्द कौशल
(5) लोचन प्रसाद पाण्डेय (6) लाला जगदलपुरी
(7) पवन दीवान (8) कोदूराम दलित

अंक विभाजन

प्रश्न 1	–	1X 15	=	15 अंक
प्रश्न 2	–	1X 15	=	15 अंक
प्रश्न 3	–	1X 15	=	15 अंक
प्रश्न 4	–	1X 15	=	15 अंक
प्रश्न 5	–	5X2	=	10 अंक
प्रश्न 6	–	10X1	=	10 अंक
		योग	=	**80 अंक**
		आंतरिक मूल्यांकन		**20 अंक**

निर्धारित पुस्तकें:–

1. छत्तीसगढ़ी भाषा का उद्‌विकास – डॉ. नरेन्द्र देव वर्मा
2. छत्तीसगढ़ी, हलबी, भतरी भाषाओं का भाषा वैज्ञानिक अध्ययन – भालचंद्र राव तैलंग
3. छत्तीसगढ़ी परिचय– डॉ. बलदेव मिश्र
4. छत्तीसगढ़ी लोकसाहित्य का अध्ययन – दयाशंकर शुक्ल
5. छत्तीसगढ़ी लोकजीवन और लोकसाहित्य का अध्ययन – डॉ. शकुन्तला वर्मा
6. छत्तीसगढ़ी भाषा का शास्त्रीय अध्ययन– डॉ. शंकर शेष
7. प्राचीन छत्तीसगढ़ी बोली – प्यारेलाल गुप्त
8. छत्तीसगढ़ी लोक साहित्य और भाषा – डॉ. बिहारीलाल साहू
9. छत्तीसगढ़ी भाषा और साहित्य – डॉ. सत्यभामा आडिल
10. छत्तीसगढ़ के साहित्यकार – देवीप्रसाद वर्मा
11. मानक छत्तीसगढ़ी व्याकरण – चंद्रकुमार चंद्राकर

5/7/2021 डॉ आशा दीवान (डॉ. खिमाराम शर्मा)

HEMCHANDYADAV VISHWAVIDYALAYA, DURG (C.G.)

Website -www.durguniversity.ac.in, Email - durguniversity@gmail.com

SCHEME OF EXAMINATION
&
SYLLABUS
of
M.Sc. (Physics) Semester Exam

UNDER

FACULTY OF SCIENCE

Session 2022-23

(Approved by Board of Studies)
Effective from July 2022

5/7/2022 05/07/2022 5/7/2022 05-07-22

HEMCHAND YADAV VISHWAVIDYALAYA, DURG (C.G.)

Syllabus for M.Sc. Physics (Semester System)

Semester – I (2022-2023)

Paper – I	: Mathematical Physics
Paper – II	: Classical Mechanics
Paper – III	: Electrodynamics & Plasma Physics
Paper – IV	: Electronics
Laboratory Course I-A	: General & Optics
Laboratory Course I-B	: Electronics

Semester – II (2022-2023)

Paper – I	: Quantum Mechanics - I
Paper – II	: Statistical Mechanics
Paper – III	: Electronic & Photonic Devices and Optical Modulators
Paper – IV	: Computational Methods & Programming
Laboratory Course I-A	: Numerical Analysis & Computer Programming
Laboratory Course I-B	: Digital Electronics &Microprocessor

Semester – III (2022-2023)

Paper – I	: Quantum Mechanics - II
Paper – II	: Atomic & Molecular Physics
Paper – III	: Solid State Physics - I
Paper – IV	: (A) Astronomy & Astrophysics - I (B) Electronics (Communication) - I (C) Physics of Nano-material - I (D) Space Physics - I
Laboratory Course III-A	: Material Science & General
Laboratory Course III-B	: Astronomy & Astrophysics **OR** Electronics (Communication **OR** Physics of Nano-material **OR** Space Physics

Semester – IV (2022-2023)

Paper – I	: Nuclear & Particle Physics
Paper – II	: Laser Physics and Applications
Paper – III	: Solid State Physics - II
Paper – IV	: (A) Astronomy & Astrophysics - II (B) Electronics (Communication) - II (C) Physics of Nano-material - II (D) Space Physics - II

Project Work

The Syllabus for M.Sc. Physics (Semester System) is hereby approved by the members of the Board of Studies.

5/7/22 05/07/22

M. Sc. - PHYSICS

M.Sc. in Physics is a full time 2-year (4-semesters course). There will be four theory papers, and two laboratory courses/project in each semester. In each semester, there will be two internal examinations/assessments. Semester-wise course structure along with distribution of marks is given below:

Semester I

Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Mathematical Physics	80	16	20	04	100	4
2. Classical Mechanics	80	16	20	04	100	4
3. Electrodynamics & Plasma Physics	80	16	20	04	100	4
4. Electronics	80	16	20	04	100	4
A : General & Optics	-		-		100	2
Laboratory Course I-B : Electronics	-		-		100	2
Total Marks					**600**	**20**

Total Marks for Semester I = 600 & Credit = 20

Semester II

Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Quantum Mechanics-I	80	16	20	04	100	4
2. Statistical Mechanics	80	16	20	04	100	4
3. Electronic & Photonic Devices and Optical Modulators	80	16	20	04	100	4
4. Computational Methods & Programming	80	16	20	04	100	4
Laboratory Course II-A : Numerical Analysis & Computer Programming	-		-		100	2
Laboratory Course II-B : Digital Electronics & Microprocessor	-		-		100	2
Total Marks					**600**	**20**

Total Marks for Semester II = 600 & Credit = 2

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Semester III

Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Quantum Mechanics-II	80	16	20	04	100	4
2. Atomic & Molecular Physics	80	16	20	04	100	4
3. Solid State Physics-I	80	16	20	04	100	4
4. (A) Astronomy & Astrophysics-I (B) Electronics (Communication)-I (C) Physics of Nano-material-I (D) Space Physics-I	80	16	20	04	100	4
Laboratory Course III-A Materials Science & General	-		-		100	2
Laboratory Course III-B : Astronomy & Astrophysics **OR** : Electronics (Communication) **OR** : Physics of Nano-material **OR** : Space Physics	-		-		100	2
Total Marks					**600**	**20**

Total Marks for Semester III = 600 & Credit = 20

Semester IV

Name of the Paper	Marks					Credits
	Theory		Internal		Total	
	Max	Min	Max	Min		
1. Nuclear & Particle Physics	80	16	20	04	100	4
2. Laser Physics and Applications	80	16	20	04	100	4
3. Solid State Physics -II	80	16	20	04	100	4
4. (A) Astronomy &Astrophysics-II (B) Electronics(Communication)-II (C) Physics of Nano-material-II (D) Space Physics-II	80	16	20	04	100	4
Project Work	-		-		200	4
Total Marks					**600**	**20**

Total Marks for Semester IV = 600 & Credit = 20

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In Each Semester

MAXIMUM MARKS TOTAL	PASS PER TH.	PR.
600	36	36

In semester IV, Project work in Solid State Physics/ Astronomy & Astrophysics/ Electronics/ Physics of Nano-materials/ Space Physics will lead to specialization in the respective area. It will be primarily based on research oriented topics. On completion of the project, student will submit project report in the form of dissertation which will be examined by an external examiner. The examination of project work shall consist of (a) Presentation and (b) comprehensive viva-voce.

Marks-distribution for Laboratory Courses and Project Work:

(a) Laboratory courses (Semesters I-III):

Sessional	: 20Marks
Viva	: 20Marks
Experiment	: 60Marks

(b) Project Work (Semester IV):

Report–Dissertation	: 60 Marks
Presentation	: 100 Marks
Comprehensive viva-voce	: 20 Marks Internal
assessment	: 20 Marks

Note: Paper IV of both Semesters III and IV is a major elective course. Student has to opt for any one of the courses: (A) or (B) or (C) or (D). The commencement of any one of the major elective paper is subjected to the availability of basic infrastructural facilities viz. expert faculty, laboratory etc.

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Detailed Course Content

Semester – I

(2022--23)

PAPER-I: MATHEMATICAL PHYSICS

Unit-I: Vector space and Matrices, Linear independence, Bases, dimensionality, Inner product, Linear transformation, matrices, Inverse, Orthogonal and Unitary matrices, Independent element of a matrix, Eigen values and Eigen Vectors, Diagonalization, Complete orthonormal sets of functions.

Unit-II: Complex Variables: Cauchy- Riemann condition, analytic functions, Cauchy's theorem, Cauchy integral formula, Laurent series, singularities, residue theorem, contour integration, evaluation of definite integrals, problems.

Unit-III: Differential equations, first order differential equation, second order differential equation with constant coefficients, second order linear ODEs with variable coefficients, Solution by series expansion, nonhomogeneous differential equations and solution by the method of Green's functions.

Unit-IV: Special functions, Legendre, Bessel, Hermite and Laguerre functions with their physical applications, generating functions, orthogonality conditions, recursion relations,

Unit-V: Integral transforms, Fourier integral and transforms, inversion theorem, Fourier transform of derivatives, convolution theorem, Laplace Transform(LT), LT of Derivatives, Inverse LT, Fourier series; properties and applications, discrete Fourier transform.

TEXT AND REFERENCE BOOKS

1. Mathematical Methods for Physics, by G. Arfken.
2. Matrices and Tensors for Physicist, by A. W. Joshi.
3. Advanced Engineering Mathematics, by E. Kroyazig.
4. Special Functions, by E. B.Rainville.
5. Special Functions, by W.W.Bell.
6. Mathematical Method for Physicist and Engineers, by K. F. Relly, M. P. Hobson and S. J.Bence
7. Mathematics for Physicists, By Marry L.Boas.

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Paper - II: CLASSICAL MECHANICS

Unit-I Preliminaries, Newtonian mechanics of one and many particle systems, Conservation laws, Constraints & their classification, Principle of virtual work, Generalized coordinates, D'Alembert's principle and Lagrange's equations, Velocity-dependent potentials and dissipation function, Simple applications of the Lagrangian formulation, Hamilton's principle, Lagrange's equations from Hamilton's principle, Conservation theorems and Symmetry properties, Energy function and the conservation of energy.

Unit-II The Hamiltonian formulation of mechanics, Legendre transformations and the Hamilton's equations of motion, Cyclic coordinates and Conservation Theorems, Hamilton's equations from Hamilton's principle, The principle of least action, Simple applications of the Hamiltonian formulation.

Unit-III Canonical transformations with examples, The harmonic oscillator, Poisson's brackets, Equations of motion and conservation theorems in the Poisson Bracket formulation. Hamilton-Jacobi (HJ) theory: The HJ equation for Hamilton's principal function, Harmonic oscillator as an example of the HJ method, The HJ equation for Hamilton's characteristic function, The action-angle variables

Unit –IV The Central force: Two-body central force problem and its reduction to the equivalent one-body problem, The equations of motion and first integrals, The equivalent one-dimensional problem and classification of orbits, The differential equation of the orbit, Closure and stability of orbits, The Kepler problem, Scattering in a central force field: Rutherford scattering.

Unit – V Rigid body dynamics, The Euler angles, Euler's theorem on the motion of a rigid body, Rate of change of a vector, The Coriolis force, Angular momentum and Kinetic energy of motion about a point, The Euler equations of motion of rigid bodies. Formulation of the problem of small oscillations, The Eigen-value equation and the principal axis transformation, Frequencies of free vibration and normal coordinates, Free vibration of linear triatomic molecule.

TEXT AND REFERENCE BOOKS

1. Classical Mechanics, By N.C. Rana and P.S. Joag (Tata McGraw-Hill,1991)
2. Classical Mechanics, by H.Goldstein (Addison Wesley,1980)
3. Classical Mechanics, by H.Goldstein, C Poole & J Fafko (PearsonEducation, Inc,2002)
4. Mechanics, by A.Sommerfeld, (Academic press,1952)
5. Introduction to Dynamics by Perceival and D.Richaeds(Cambridgeniversity, press ,1982).

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Paper-III: ELECTRODYNAMICS & PLASMA PHYSICS

Unit-I Maxwell's equations, vector and scalar potentials and the wave equation, Gauge transformations, Lorentz gauge, Coulomb gauge, Green function for the wave equation, four-vectors, mathematical properties of the space-time in special relativity, matrix representation of Lorentz transformation, covariance of electrodynamics, transformation of electromagnetic fields.

Unit-II Radiation by moving charges, Lienard-Wiechert potential and fields for a point charge, total power radiated by an accelerated charge- Larmor's formula and its relativistic generalization, angular distribution of radiation emitted by an accelerated charge, radiation emitted by a charge in arbitrary extremely relativistic motion, distribution in frequency and angle of energy radiated by accelerated charge.

Unit -III Bremsstralung: emission from single-speed electrons, thermal Bremsstralung emission and absorption, Synchrotron radiation: spectrum of synchrotron radiation, spectral index for power law electron distribution, transition from Cyclotron to Synchrotron emission, Cherenkov radiation

Unit-IV Plasma: definition, Debye shielding phenomenon and criteria for plasma, motion of charged particles in electromagnetic field; Uniform E & B fields, Electric field drift, Non-uniform magneto static field, Gradient B drift, Parallel acceleration and magnetic mirror effect, Curvature drift, adiabatic in variants.

Unit-V Elementary concepts of plasma kinetic theory, the Boltzmann equation, the basic plasma phenomena, plasma oscillations. Fundamental equations of magneto- hydrodynamics (MHD), Hydrodynamics Waves; Magneto sonic and Alfven waves, Magnetic viscosity and magnetic pressure, plasma confinement schemes.

REFERENCE BOOK:

1. J.D. Jackson-classical electrodynamics.
2 Rybicki & Lightman: Radiative Processess in Astrophysics
2 Panofsky and Phillips: Classical electricity and magnetism.
3 Bittencourt Plasma physics.
4 Chen: Plasma physics.

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Paper - IV: ELECTRONICS

Unit-I Operational Amplifier- Basic Op.Amp. Differential amplifier, the emitter coupled Difference Amp, Transfer characteristics of a Differential Amp, an example of an IC Op.-Amp., off set error voltage and currents, measurement of Op.-Amp. Parameters, frequency response of Op-Amp. Linear analog systems: Basic Op.-Amp. Applications, Analog integration and differentiation, Electronic analog computation, Non-linear analog systems: Comparators, Wave form generators.

Unit-II Combinational Logic Gate – Basic logic gates: OR, AND and NOT gates, NOR and NAND gates, Boolean algebra, DeMorgan's theorem, Exclusive OR gate, characteristics of logic families, saturated logic families: RTL, DCTL, non- saturated logic families: TTL and ECL, Unipolar logic families.

Unit -III Sequential Logic, Flip-flops: RS Flip-flop, level clocking, Edge triggered Flip Flops, D Flip flops. JK Flip-flops, J.K. master slave Flip-flops, Registers: buffer, shift and control shift registers, counters: ripple synchronous & ring counters, tri - state registers, Buffer: controlled buffer Register, Bus organized structure, Latch, multiplexer, De multiplexer, decoder, ALU Memories: RAM, ROM, PROM, EPROM, A/D and D/A converters.

Unit-IV Microprocessors – Building concept of microprocessors, developing inside of microprocessor , Instruction codes ,Instruction Register ,Introducing RESET Pin, Introducing on chip oscillator, Interfacing I/O devices, Introducing Interrupt lines :Stack, Push, Pop operation ,delay in servicing interrupts, multiply interrupts, location for interrupts .Introducing slow and fast data transfer, Status of microprocessor, interrupt pins, General purpose Register, flag Register, Increment/decrement register. Features of 8085 microprossor. Pin diagram of 8085, block diagram of 8085. CPU of a microprocessor, timing and control, system timings and interrupt timings of 8085, registers in 8085, interfacing memory and I/O devices- a preliminary ideas. Number system, Floating Point notation.

Unit - V Instructions set of 8085, types of instructions- Data transfer group, Arithmetic logic, branch group, stack I/O machine control group, addressing mode of Intel 8085, examples of Assembly language programs of 8085, summing of two 8-bit numbers to result a 16-bit number, summing two 16-bit number, multiplying two 8-bit number to result a 16-bit product, block transfer of data from one memory block to other, BCD to hexadecimal data, finding the largest number in a series.

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Text and reference books:

1. Integrated Electronics: J. Millman R.C.C. Halkias.
2. Electronics devices and circuit theory, by Robert Boylested and Louis Nashdaky PHI, New Delhi-110001,1991.
3. Operational amplifier linear integrated circuits, by Romakanth A. GayakwadPHI, second edition1991.
4. Digital computer electronics- An introduction tomicrocomputers-A.P.Malvino.
5. Digital finances and applications, by A.P. Malvino and Donald P.Leach,Tata McGraw Hill company, New Delhi 1993.
6. Microprocessor architecture, programming applications with 8085/8086 by Ramesh S.Gaonkar, Willey-Eastern limited1987.
7. Introduction to microprocessors – A.P.Mathur (TataMcGraw).
8. Microprocessors-Theory and applications- M.Hafiquizzaman (Prenticehall).
9. Microprocessors fundamentals- SchanmiOutling Service AuthorPocerL.Tokheim.
10. Integrated circuits : K KBotkar(Khannapublications)
11. Digital Electronics : R P Jain (Tata McGrawHill)
12. Microprocesss : BRam
13. 8-bit microprocessor : V.J.Vibhute& P.B. Borole(Tecn-Max Publication,Pune)

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Laboratory Course

Lab I-A: General & Optics (Any ten)

1. Determination of band gap of semiconductor by four probmethod.
2. Measurement of Hall Coefficient of given semiconductor: identification of type of semiconductor and estimation of charge carrierc on centration.
3. Determination of wavelength of mercury light by constant deviation spectrometer using Hartmann formula.
4. Ultrasonic velocity in a liquid as a function of temperature using ultrasonic interferometer.
5. Experiment on transmission line (A) Determination of characteristics impedance, (B) Study of voltage distribution.
6. Determination of the Curie temperature of ferromagnetic material.
7. Determination of forbidden gap of a diode by plotting reverse saturation current as a function of temperature.
8. Determination of operating voltage and study the characteristics of a G Mtube.
9. Determination of operating voltage of a GM tube and determine the linear absorption coefficient.
10. Determination of operating voltage of a GM tube and verify inverse-square law.
11. Determination of short half-life of a given source which can be obtained from a mini generator or produced with a neutron source by activation.
12. X-ray diffraction by Telexometer.
13. Determination of ionization potential of Lithium/Mercury.
14. Determination of e/m of electron by Normal Zeeman Effect using Febry-Perot Etalon.
15. Determination of Dissociation energy of iodine (I_2) Molecule by photography, the absorption bands of I_2 in the visible region.
16. Measurement of wavelength of He-Ne Laser light using a ruler and thickness of thin wire by the laser.
17. To study Faraday Effect using He-Ne Laser.

Lab I-B: Electronics (Any ten)

1. Design & Study of Regulated Power supply.
2. Study of Transistor Amplifiers in CE, CB, and CC modes.
3. Study of Transistor Bias Stability.
4. Study of Astable, Monostable and Bistable Multivibrator.
5. Study of Silicon Controlled Rectifier.
6. Experiment of Uni – Junction Transistor and its application.
7. Experiment of FET and MOSFET characterization and application as an amplifier.
8. Study of Differential. Amplifier.
9. Basic Logic gates and verification of their Truth-Tables.
10. Combinational logic gates and verification of De-Morgan's Theorem.
11. Study of Basic Operational Amplifier(741).
12. Study of Opto- Electronics Devices.

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Semester – II

PAPER - I: QUANTUM MECHANICS-I

Unit - I Inadequacy of classical mechanics, Planck's quantum hypothesis and radiation law, Photoelectric effect, De-Broglie's theory. Schrödinger equation, continuity equation, Ehrenfest theorem, admissible wave functions, stationary states, one-dimensional problems; potential well and barriers, Schrödinger equation for harmonic oscillator and its solution, uncertainty relations, states with minimum uncertainty product.

Unit –II Superposition principle, general formalism of wave mechanics, representation of states and dynamical variables, commutation relationship, completeness and normalization of Eigen functions, Dirac-delta function, Bra & Ket notation, matrix representation of an operator, harmonic oscillator and its solution by matrix method, Heisenberg equation of motion.

Unit -III Angular momentum in quantum mechanics, commutation relationships, Eigen values, Spin angular momentum, Pauli`s matrices, addition of angular momentum, Clebsch-Gordon coefficients.

Unit – IV Central force problem, spherically symmetric potentials in three dimensions, separation of wave equation, parity, three-dimensional square-well potential and energy levels, the hydrogen atom; solution of the radial equation, energy levels and stationery state wave functions, discussion of bound states, degeneracy.

Unit –V Time- independent perturbation theory, non-degenerate case, first order and second order perturbations with the example of an oscillator, degenerate cases, removal of degeneracy in second order, Zeeman effect without electron spin, first-order Stark effect in hydrogen, perturbed energy levels, correct Eigen function, occurrence of permanent electric dipole moments.

TEXT AND REFERENCE BOOKS:

1. L.I. Schiff: quantum mechanics (McGraw-Hill).
2. S. Gasiorowicz, Quantum Physics(Wiley).
3. Landau and Lifshitz : Non-relativistic quantum mechanics.
4. B.Craseman and Z.D.Powell: quantum mechanics (Addison Wesley)
5. A.P. Messiah: Quantum Mechanics.
6. J.J. Sakurai : Modern Quantum Mechanics.
7. Mathews and Venkatesan : Quantum Mechanics.

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PAPER – II: STATISTICAL MECHANICS

Unit-I Foundation of statistical mechanics: macroscopic and microscopic states, contact between statistical and thermo dynamical quantities, physical significance of Ω(N, V, E), the classical gas, entropy of mixing and Gibb's paradox, phase space of classical system, Liouville`s theorem and its consequences, quantum states and phase space.

Unit- II Elements of ensemble theory – A system in micro canonical, canonical, and grand canonical ensembles, partition functions, physical significance of statistical quantities, example of classical system, energy and energy-density fluctuations and mutual correspondence of various ensembles.

Unit -III Formulation of quantum statistics – Quantum mechanical ensemble theory, density matrix, statistics of various quantum mechanical ensembles, system composed of indistinguishable particles.
Theory of simple gases –Ideal gas in various quantum mechanical ensemble, Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac distributions, statistics of occupation number.

Unit - IV Ideal Bose and Fermi gases -Thermodynamical behavior of an ideal Bose gas, Bose-Einstein condensation and, elementary excitations in liquid helium II, Thermodynamic behavior of an ideal Fermi gas, the electron gas, nonrelativistic and relativistic degenerate electron gas, theory of white dwarf stars.

Unit -V Statistical Mechanics of interacting systems – the method of cluster expansion for a classical gas, Virial expansion of the equation of state. Theory of phase transition – general remark on the problem of condensation, Fluctuations: thermodynamic fluctuations, Spatial correlation in a fluid Brownian motion: Einstein Smoluchowski theory of Brownian motion.

TEXT & REFERENCE BOOKS –

1. R. K. Pathria, Statistical Mechanics (PergamonPress).
2. L. D. Landau & E. M. Lifshitz (Butter worth and HeinemannPress).
3. FederickReif, Fundamental of statistical and thermal physics (McGraw-Hill publishers).
4. Kerson Huang, Statistical Mechanics (WileyEastern).

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PAPER –III: ELECTRONIC & PHOTONIC DEVICES AND OPTICAL MODULATORS

Unit– I Special Bipolar devices: Thyristors- the four-layer diodes and their basic characteristics, Schottky diode, three terminal thyristor, Diac &Triac, SCR, UJT, Field controlled Thyristors.

Unit- II Unipotar Devices : JFET, MESFET and MOSFET, basic structure, working and device I-V characteristics, small signal equivalent circuit for Microwave performance Introduction to MIS and MOS diodes, charge coupled devices (CCDs), basic structure and working principle , MOSFET-basic device characteristics, types of MOSFET.

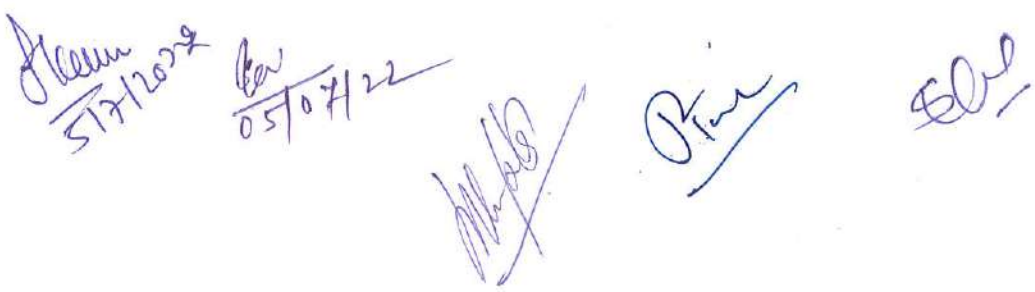
Unit-III Special Microwave Devices: Tunnel diode and backward diode- basic device characteristics, IMPATT diodes and their static and dynamic characteristics, Transfer electron devices- transferred electron effect, Gunn diodes.

Unit-IV Photonic Devices: Radiative transitions, LEDs, Visible and infrared SC lasers; Photo detectors; Photo conductor, & Photodiode, Solar cells, Solar radiation and ideal conversion efficiency, p-n junction solar cells, Hetero junction. Interface thin film solar cells.

Unit -V Optical Modulators and Display Devices: Modulation of light- Birefringence, Optical activity, Electro-optic, Magneto-optic and Acoustic- optic effects, Materials exhibiting these properties, Non-linear optics. Display devices: Luminescence, Photo-luminescence, Electro-luminescence, Liquid crystal displays, Numeric displays.

TEXT & REFERENCE BOOKS-

1. Semiconductor Devices – Physics and Technology, by S M Sze,Wiley(1985)
2. Introduction to semiconductor device, M.S. Tyasi, John Wiley andsons
3. Measurement, Instrumentation and experimental design in physics and engineering by M.Sayer and A.Mansingh, Prentice Hall India2000
4. Optical electronics by Ajay Ghatak and K.Thyagarajah, Cam.Univ.Press.
5. Opto electronics – An introduction: J.Wilson and JFB Hawkes (Eastern Economy Edition).
6. Optical Communications: J.H. Franz and V.K. Jain(Narosa).



PAPER – IV: COMPUTATIONAL METHODS AND PROGRAMMING

Unit–I Methods for determination of zeroes of linear and nonlinear algebraic equations and transcendental equations, convergence of solutions. Solution of simultaneous linear equations, Gaussian elimination, pivoting, iterative method, matrix inversion.

Unit –II Finite differences, interpolation with equally spaced and unevenly spaced points, curve fitting, polynomial least squares and cubic spline fitting. Numerical differentiation and integration, Newton-Cotes formulae, error estimates, Gauss method.

Unit –III Numerical solution of ordinary differential equations, Euler and Runge-Kutta methods, predictor-corrector method, elementary ideas of solutions of partial differential equations.

Unit- IV Elementary information about digital computer principles, compilers, interpreters and operating systems (Windows/Linux) Fortran programming, flow charts, integers and floating point arithmetic, expressions, built in functions.

Unit-V Executable and non-executable statements, assignments, control and input-output statements, subroutines and functions; The statement functions, main features of functions and subroutines, subprogram, function subprogram, overall structure of FORTRAN program, external statement, subroutine subprogram, common statement, equivalence statement, operations with files-open and close statement, Format statements, field specifications.

TEXT AND REFERENCE BOOKS

1. Sastr: Introductory Methods of NumericalAnalysis.
2. Rajaraman: NumericalAnalysis.
3. Antia: Numericalmethods.
4. Raja Raman: FORTRANprogramming.

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Laboratory Course

Lab II-A: Numerical Analysis & Computer Programming (Any ten)

1. To solve simultaneous Linear equation by Gauss Elimination method.
2. To calculate the root of a transcendental equation by Newton – Raphsons method.
3. Solving the system of linear simultaneous equation by Gauss Serdel method.
4. Numerical Integration by Simpson's 1/3Rule.
5. Solving simultaneous Linear equation by Gauss-Jordon method.
6. Solution of Differential equation by Euler's Method.
7. To invert a given matrix by Gauss-Jordon Method.
8. Solution of Differential equation by Runga Kutte Method.
9. To fit the given data in a straight line by linear regression Method.
   a) WAP to find the Largest of n number of series.
   b) To calculate the standard deviation of a given set of data.
10. To write a program to compute the complex roots of a given polynomial of N^{th} degree by Grafffe's Method.
11. To write a program to compute the Eigen values of a given matrix.
12. To integrate a given function by: (a) Trapezoidal method or by (b) Gauss Quadrature.
13. To find solutions of Ist order, ordinary differential equation by Taylor method

Lab II-B: Digital Electronics & Microprocessor (Any ten)

1. Study of R-S, D/T, J-KFlip-Flops.
2. Study of counters: Ripple, Mode 3, Mode 5counters.
3. Study of ShiftRegister.
4. Study of R-2R D/AConverter.
5. Study of Random Access Memory (RAM) Read Only Memory.(ROM)
6. Study of A/DConverter.
7. Experiment with Microprocessor:-I
   (a) Convert BCD in toHEXADECIMPL
   (b) To transfer group of date blocks from one location to anotherlocation.
8. Experiment with microprocessor: -II
   (a) To write programs for addition of two 1 byte data giving results of 2bytes.
   (b) To write programs for multiplication of two 1 byte data giving results of 2bytes.
9. (a) To add 2 16-BIT numbers stored in locations from x xxx to x xxx + 3 andadd them store the results from x xxx + 4 to x xx x+6 memorylocation
   (b) To find the largest of n numbers of aseries.
10. To arrange N numbers in an ascendingorders.
11. Experiments withMicroprocessor.
    (a) Convert BCD in to binary andvice-versa.
    (b) To transfer group of data blocks from one location to anotherlocation.
    (c) To write programs for addition of two 1byte data giving result of 2bytedata
    (d) To write programs for multiplication of two 1 byte data giving result of 2bytedata.
12. Logic gate study DTL andRTL.
13. Study ofadder/Subractor.

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Semester – III

PAPER –I: QUANTUM MECHANICS -II

Unit-I Variational method, expectation value of energy, application to excited states, ground state of He-atom, Zero point energy of one dimensional harmonic oscillator, Vander-waals interaction, the W.K.B. approximation, approximate solutions, asymptotic nature of the solution, solution near turning point, connection formulae, energy levels of a potential well and quantization rule.

Unit-II Theory of scattering: differential and total scattering cross section, wave mechanical picture of scattering & the scattering amplitude, Green's functions and formal expression for scattering amplitude, The Born approximation and its validity, Partial wave analysis, asymptomatic behavior of partial waves and phase shifts, optical theorem, scattering by a square well potential, scattering by a hard sphere, scattering by a Coulomb potential.

Unit - III Time-dependent perturbation theory, first order perturbation, Harmonic perturbation, Fermi`s Golden rule, Ionization of a H-atom, absorption and induced emission, Selection rules. Identical particles, symmetric and anti-symmetric wave functions

Unit - IV Relativistic quantum mechanics, formulation of relativistic quantum theory, the Klein-Gordon equation; plane wave solutions, charge and current densities, The Dirac equation for a free particle, matrices alpha and beta, Lorentz covariance of the Dirac equation, free particle solutions and the energy spectrum, charge and current densities.

Unit-V The spin of the Dirac particle, Dirac particle in electromagnetic fields and the significance of the negative energy state, Dirac equation for a central field: Spin angular momentum, approximate reduction, spin –orbit energy, separation of equation, the hydrogen atom, classification of energy levels and negative energy states.

TEXT AND REFERENCE BOOKS –

1. L.I. Schiff: Quantum Mechanics (McGraw-Hill).
2. S.Gasiorowicz: Quantum Physics (Wiley).
3. Landau and Lifshitz : QuantumMechanics.
4. B.Craseman and Z.D.Powell : Quantum Mechanics (AddisonWesley)
5. A.P. Messiah: QuantumMechanics.
6. J.J. Sakurai: Modern QuantumMechanics.
7. Mathews and Venkatesan: QuantumMechanics.
8. Bjorken and Drell :Relativstic QuantumMechanics.

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PAPER –II: ATOMIC AND MOLECULAR PHYSICS

Unit-I Quantum states of one electron atoms-atomic orbitals, Hydrogen spectrum, spin-orbit(l-s) interaction energy, fine structure of hydrogen spectrum including l-s interaction and relativistic correction, spectra of alkali elements, fine structure in alkali spectra, penetrating and non-penetrating orbits, intensity rules.

Unit-II Pauli's principle, equivalent and non-equivalent electrons, ground state(basic level of different elements), two electron systems, interaction energy in L-S. and J-J. Coupling, Hyperfine structure, line broadening mechanisms (general ideas).

Unit – III Normal and anomalous Zeeman effect, early discoveries and developments, vector models of one electron system in a weak magnetic field, magnetic moment of a bound electron, magnetic interaction energy, selection rules, intensity rules, Paschen-Back (PB) effect – principal series effect, Zeeman and PB effects in hydrogen, Stark effect- discovery, Stark effect in Hydrogen, orbital model, weak and strong effect in Hydrogen.

Unit-IV Types of molecules: linear and diatomic molecules, symmetric top, asymmetric top and spherical top molecules. Rotational spectra of diatomic molecules: rigid rotator model, energy levels, Eigen functions, spectrum, comparison with observed spectrum and non-rigid rotator model, Intensities of spectral lines, microwave spectrometer, Raman spectrum; classical and quantum theory of Raman Effect, pure rotational Raman spectrum.

Unit-V Vibrational spectra of diatomic molecules: simple harmonic model, energy levels and spectrum, comparison with observed spectrum and anhormonic model, Vibrating rotators, Interaction of rotations and vibrations, fine structures and P-Q-R branches, IR spectrometer, Vibrational Raman spectrum, Vibrational rotational Raman spectrum.

TEXT AND REFERENCE BOOKS:

1. Introduction to atomic spectra - H.E. White(T).
2. Fundamentals of molecular spectroscopy – C.N. Banwell and E.M McCash(T).
3. Spectroscopy vol. I, II and III – Walker andstraughner.
4. Introduction to Molecular spectroscopy – G.M.Barrow.
5. Spectra of diatomic molecules –Herzberg.
6. Molecular spectroscopy – JeanneL.Mc-Hale.
7. Molecular spectroscopy – J.M.Brown.
8. Spectra of atoms and molecules–P.F.Bemath.
9. Modern spection copy, J.M.Holias.

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PAPER – III: SOLID STATE PHYSICS-I

Unit- I: **Electrons in Solids and Electronic Properties**

Energy bands: nearly free electron model, origin of energy gap and its magnitude, Bloch function, Kronig-Penny model, Wave equation of electron in periodic potential, restatement of Bloch theorem, crystal moment of an electron, solution of Central equation, Kronig-Penny model in reciprocal space, empty lattice Approximation, approximate solution near zone boundary, Number of orbitals in a band, metals and insulators.

Unit -II: **Fermi surfaces and metals**

Effect of temperature on F-D distribution, free electron gas in three dimensions. Different zone schemes, reduced and periodic zones, construction of Fermi surfaces, nearly free electrons, electron, hole, open orbits, Calculation of energy bands, Tight binding, Wigner-Seitz, cohesive energy, pseudo potential methods. Experimental methods in Fermi surface studies, quantization of orbits in a magnetic field, de Haas van Alphen Effect, External orbits, Fermi surface of copper.

Unit- III: **Crystal vibration and thermal properties**

Lattice dynamics in monoatomic and diatomic lattice: two atoms per primitive basis, optical and acoustic modes, quantization of elastic waves, phonon momentum, inelastic neutron scattering by phonons, Anharmonic crystal interactions-thermal expansion, thermal conductivity, thermal resistivity of phonon gas, umklapp processes, imperfections.

Unit –IV: **Electron-Phonon interaction- superconductivity**

Experimental survey: occurrence of superconductivity, Destruction of superconductivity by magnetic field, Meissner effect, heat capacity, energy gap, MW, and IR properties, isotope effect. Theoretical survey : thermodynamics of superconducting transition, London equation, Coherence length, Cooper pairing due to phonons, BCS theory of superconductivity, BCS ground state, flux quantization of superconducting ring, duration of persistent currents, Type II superconductors, Vortex states, estimation of H_{C1} and H_{C2}, single particle and Josephson superconductor tunneling, DC/AC Josephson effect, Macroscopic quantum interference. High temperature superconductors, critical fields and currents, Hall number, fullerenes ring.

Unit – V: **Semiconductor crystals**

Band gap, equation of motion, physical derivation of equation of motion, holes, effective mass, physical interpretation of effective mass, effective masses of semiconductors Si and Ge, intrinsic carrier concentration, intrinsic mobility, impurity conductivity, donor and acceptor states, thermal ionization of donors and acceptors, thermo-electric effects.

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TEXT AND REFERENCE BOOKS:-

1. C. Kittel: Introduction to Solid State Physics (Wiley andSons).
2. J.M.Ziman: Principles of theory of solids (CambridgeUniv.Press).
3. Azaroff: X-raycrystallography.
4. Weertman and weertman : Elementary DislocationTheory.
5. Verma and Srivastava: Crystallography for Solid StatePhysics.
6. Azeroff and Buerger: The PowerMethod.
7. Buerger: Crystal StructureAnalysis.
8. Thomas: Transmission ElectronMicroscopy.
9. Omar: Elementary solid statephysics.
10. Ashcroft and Mermin: Solid StatePhysics.
11. Chalking and Lubensky: Principles of Condensed MatterPhysics.
12. Madelung: Introduction to solid statetheory.
13. Callaway: Quantum theory of solid statephysics.
14. Huang: Theoretical Solid StatePhysics.
15. Kittel: Quantum theory ofsolids.

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PAPER –IV (A): ASTRONOMY AND ASTROPHYSICS-I

Unit - I Stars-apparent magnitudes, Colour index, Spectral classification, Stellar distances, Absolute magnitude, The H-R diagram of stars.
Stellar interiors: The basic equations of stellar structure, Hydrostatic equilibrium, Thermal equilibrium, Virial Theorem, Energy sources, Energy transport by radiation and convection, Equation of state

Unit - II Formation and evolution of stars: Inter stellar dust and gas, Formation of protostars, Pre-main sequence evolution, Post main sequence evolution and Evolution on the main sequence for low and high mass stars, Late stages of evolution, Fate of massive stars, Supernovae and its characteristics.

Unit – III End states of stars, degenerate states, White dwarfs, and Chandrasekhar limit, Neutron stars and Pulsars, Black holes.
Binary stars and their classification, close binaries, Roche Lobes, Evolution of semidetached systems: Algols, Cataclysmic variables and X-ray binaries.

Unit - IV Solar Physics: Physical Characteristics of sun, Photosphere: Limb darkening, Granulation, Faculae, Solar Chromosphere and Corona, Prominences, Solar Cycle and Sunspots, Solar Magnetic Fields, Theory of Sunspots, Solar flares, solar wind, Helioseismology.

Unit - V Observational and Conceptual foundations of Newtonian gravity and General Theory of Relativity(GR), Principle of Equivalence, Metric tensor, Covariant differentiation, Riemann curvature tensor, Geodesics.
Stress- Energy tensor, Einstein's field equations, Schwarzschild metric, Particle trajectories in Schwarzschild space- time, Precession of Perihelion, Gravitational red-shift and bending of light.

TEXT AND REFERENCE BOOKS:

1. Astrophysics for Physicists, Arnab Rai Choudhuri, Camb. University Press,2010.
2. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison-Wealey Pub.Co.
3. Introductory Astronomy and Astrophysics, M.Zeilik and S.A. Gregory, 4th edition, Saunders collegepublishing.
4. Theoretical Astrophysics, vol. – II: Stars and stellar systems, T. Padmanabhan, Cambridge universitypress.
5. The Physical Universe: An introduction to astronomy, F.Shu, Mill valley : University science books.

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Paper – IV (B) ELECTRONICS (Communication)-I

Unit - I **Microwave devices**

Klystron, magnetron & traveling wave tubes ,velocity modulation ,basic principle of two cavity klystrons & relex klystrons ,principle of operation of magnetrons ,helix traveling wave tubes.

Unit - II **Microwave wave guides &components**

(Wave modes) rectangular wave guides: solution of wave equation in rectangular coordinates, TE modes in rectangular wave guides, TM modes in rectangular wave guides, excitations of modes in rectangular wave guides.

Circular wave guides: solutions of wave equation in Cylindrical coordinates, TE modes in Circular wave guides, TM modes in Circular wave guides, TEM modes in Circular wave guides, excitations of modes in Circular wave guides.

Unit - III **Microwave cavities**: rectangular cavity resonator, circular –cavity resonator & semicircular cavity resonators Q- factor of a cavity resonator.

Transferred Electrons devices (TEDs)

Gunn effect diodes, principle of operation, modes of operations, read diodes, IMPATT diodes, TRAPATT diodes.

Microwave communications: advantages of microwave transmission, loss in free space, propagation of microwave, components of antennas used in MW communication system.

Unit - IV **Radar system**:

Radar-Block diagram &operation, radar frequencies ,pulse consideration, radar range equation ,derivation of radar range equation ,minimum detectable single receiver noise ,signal to noise ratio ,integration of radar pulses ,radar cross sections ,pulse reflections frequency ,antenna ,parameters ,systems losses & propagation losses ,radars transmitters receivers ,antennas displays

Unit - V **Satellite communication**

Orbital Satellite, geostationary satellite, orbital patterns, look angles, orbital spacing , satellite system ,link modules.

REFERENCEBOOKS

1) "Microwaves" by K.L. Gupta Wiley Estern Ltd.Delhi.
2) Advanced Electronic communication system by Wayne Tomsi Physicseducation.
3) Principle of communication of system-by Toub& Schilling: 2nd ed. TMH1994
4) Communication system: by SimanHaykin, 3rd ed. John wiley&sonsinc.1994.
5) Microwave devices & circuits by : Samuel, Y.Liau.
6) Electronic communication: Georgekennedy.

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Paper IV (C) PHYSICS OF NANO MATERIALS - I

Unit-I: **Nano Materials**

Properties of Nano-Particles: Metal Nano-clusters: Magic Numbers, theoretical modeling of nanoparticles, geometric and electronic structure, Reactivity, Fluctuations, magnetic clusters, Bulk to Nano transition. Semiconducting nanoparticles: optical properties, Photo fragmentation, Columbic Explosion. Rare gas and molecular clusters: Inert-Gas Clusters, Superfluid Clusters, Molecular Clusters. Methods of Synthesis: RF Plasma, Chemical Methods, Thermolysis, Pulsed Laser Methods.

UNIT II: **Carbon Nanostructures**

Carbon Molecules: Nature of Carbon Bonds, New Carbon Structures. Carbon Clusters: Small Carbon Clusters, Discovery of C_{60}, Structure of C_{60} and its Crystal, Alkali-Doped C_{60}, Superconductivity in C_{60}, Larger and Smaller Fullerenes, Other Bucky balls. Carbon Nanotubes: Fabrication, structure, Electrical Properties, Vibrational Properties, Mechanical Properties. Applications of Carbon Nanotubes: Field Emission and Shielding, Computers, Fuel Cells, Chemical Sensors, Catalysis, Mechanical Reinforcement.

UNIT III: **Bulk Nanostructured Materials**

Solid Disordered Nanostructures: Methods of Synthesis, Failure Mechanisms of Conventional Grain-Sized Materials, Mechanical Properties, Nanostructured Multilayers, Electrical Properties, Other Properties, Metal Nano cluster Composite Glasses, Porous Silicon. Nanostructured Crystals: Natural Nano crystals, Computational Prediction of Cluster Lattices, Arrays of Nanoparticles in Zeolites, Crystals of Metal Nanoparticles, Nanoparticle Lattices in Colloidal Suspensions, Photonic Crystals. Nanostructured Ferromagnetism: Basics of Ferromagnetism, Effect of Bulk Nano structuring of Magnetic Properties, Dynamics of Nano magnets, Nano pore Containment of Magnetic Particles, Nano carbon Ferro magnets, Giant and Colossal Magneto resistance, Ferro fluids.

UNIT IV: **Quantum Wells, Wires, and Dots**

Preparation of Quantum Nanostructures, Size and Dimensionality Effects: Size Effects, Conduction Electrons and Dimensionality, Fermi Gas and Density of States, Potential Wells, Partial Confinement, Properties Dependent on Density of States. Excitons, Single- Electron Tunneling, Applications: Infrared Detectors, Quantum Dot Lasers. Superconductivity.

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UNIT V: Self-Assembly and Catalysis

Self-Assembly: Process of Self-Assembly, Semiconductor Islands, Monolayers. Catalysis: Nature of Catalysis, Surface Area of Nanoparticles, Porous Materials, Pillared Clays, Colloids.

Nanomachines and Nanodevices: Microelectromechanical Systems (MEMSs), Nanoelectromechanical Systems (NEMSs): Fabrication, Nanodevices and Nanomachines. Molecular and Superamolecular Switches.

TEXT AND REFERENCE BOOKS

1. Nanostructures & Nanomaterials: Synthesis, Properties & Applications: Guozhang Cao.
2. Introduction to Nanotechnology: Charles P. Poole Jr and Franks J.Qwens.
3. Handbook of Analytical instruments, R.S.Khandpur
4. Nano materials: Synthesis properties ,characterization and application: A.S Edelstein and R.CCammaratra
5. Nanotechnology, Kohlr,Michael.
6. X-ray diffraction procedures, H. P. Klung andL.E.Alexander
7. The Powder Method IV. Azaroff and M. J.Buerger
8. Elements of X-ray diffraction, B.D.Cullity
9. Differential Thermal Analysis,R.C.Mackenzie
10. Thermal Methods of Analysis,W.W.Wendlandt
11. Synthesis, Functionalization and Surface treatment of Nanoparticles :MaricIsbella andBuraton
12. Encyclopedia of Nanotechnology, H.S.Nalwa
13. Handbook of Nanotechnology: Bhushan(Ed), Springer Verlag, New York(2004).
14. Nanostructures and Nanomaterials- Synthesis properties and Applications by Guozhong Cao (Empirical College Press World Scientific Pub.,2004).
15. Nanocomposite Science and Technology, Ajayan, Schadler andBraun
16. Fullerene & Carbon nanotubes, DresselShaus
17. Carbon Nanotubes,Elizer
18. Physical properties of CNT,Saito
19. Carbon nanotechnology, LimingDai
20. Nanotubes and nanowires, CNR Rao and Govindaraj RCSPublishing.
21. Nanotechnology in Biology and Medicine: Methods, Devices and Application by Tuan Vo-Dinh, CRC press,2007.
22. An Introduction to Quantum Computing Phillip Kaye, Raymond Laflamme, Michele Mosca
23. The Physics of Quantum Information: Quantum Cryptography, Quantum Teleportation, Quantum Computation by Dirk Bouwmeester, Artur K. Ekert, Anton Zeilinger
24. Problems And Solutions in Quantum Computing And Quantum Information Yorick Hardy Willi-HansSteeb

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PAPER –IV (D): SPACE PHYSICS - I

Unit-I: **Solar Physics**

Physical Characteristics of sun, Source of solar energy, thermonuclear reaction and building up of higher elements, Description of solar internal and external layers, Photosphere: Limb darkening, Granulation, Faculae, Solar Chromosphere and Corona, Heating of the solar chromosphere and corona, Prominences, Solar Cycle and Sunspots, Solar Magnetic Fields, Theory of Sunspots, Solar flares, Solar wind, Coronal mass ejections, Helioseismology.

Unit-II: **Planetary System**

Solar planetary system, Major characteristics of the Planets, Atmospheric Composition, Planetary magnetism, Magnetic fields, Magnetic dipole, Asteroids, Comets, Extra Solar Planets, Magnetic fields of Extra Solar Planets

Unit-III: **Celestial Mechanics**

Time and Coordinate system: Celestial Sphere, Solar Time, Sidereal Time, Julian Date, Right Ascension and Declination, Azimuth and Elevation, galactic coordinates, WGS 84 coordinate system. GPS – operation, accuracy, time and position information.

Unit-IV: **Space and Observational tools**

Electromagnetic bands of observation: radio, infrared, optical, UV, X-ray and Gamma-ray windows. Ground-based, balloon-borne and satellite-borne telescopes, Resolution of Instruments and Limitations, Optical telescopes, Photometers, Spectrographs, CCDs, Polarimeters. Radio telescopes - interferometry, X-ray and Gamma-ray detectors, Neutrino and Cosmic Ray astronomy, Radar.

Unit-V: **Space Missions**

Planetary Exploration, Early spacecraft visits to the moon, Unmanned Lunar landers; The Apollo program - man on the moon – instruments and experiments, Lunar structures; Exploration of Mercury, Venus, Mars - the Red Planet – Structure of Mars, Martian atmosphere; ice at the poles, Martian landscapes: linear features, volcanoes, and impact craters; exotic terrains; Study of Planetary moons with space missions, The Cassini-Huygens Mission, The Deep Impact Mission. Search for extra-terrestrial life – SETI experiments.

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Text and Reference Books

1. Solar System Astrophysics, J. C. Brandt and P. W.Hodge
2. Introduction to Experimental Physics, W. B. Fretter.
3. The Magnetic Field of the Earth, Roland T. Merrill, Michael W. Mc Elhinny, Phillip L. Mcfadden, Academic Press
4. Physics of Geomagnetic Phenomena, Vol. I and II, S. Matsushita. and W. H. Campbell, Academic Press
5. Earth's Magnetospheric Process, Ed. B. M. Mc Cormac, D. Reidel Publishers
6. Physics of the Magnetosphere, Eds. R. L. Corovillano, J. T. McCaulley and H. Radosky, D. Reidel Publishers
7. Solar System Plasma Physics, Vol. I, II and III, Eds. C. F. Kennel, L. J.Lanzenrutti and E. N. Parker
8. Dynamics of the Geomagnetically Trapped Radiation (Physics and Chemistry in Space, Vol II)
9. Solar Terrestrial Physics, Ed. E. R. Dyer, D. Reidel Publishers
10. Solar Magneto–Hydrodynamics, E.R. Priest; D Reidel,1982
11. R.C. Smith, Observational Astrophysics; CUP,1995.
12. C.R. Kitchin, Astrophysical Techniques; Adam Hilger,1984.
13. Digital Image Processing, R. C. Gonzales and R. E. Woods, 2nd Ed, Pearson India, 2002
14. Satellite Meteorology, S. Q. Kidder and T. H. Von der Haar, Academic Press,1995
15. Lecture Notes on Satellite Meteorology, Vol 1 and 2, SAC, Ahmedabad
16. Remote Sensing and Image Interpretation, T. M. Lillesand and R. W. Kieffer, John Wiley,2002
17. Fundamentals of Space Systems, V. L. Pisacane and R. C. Moore, Oxford University Press,1994
18. Fundamentals of Remote Sensing, George Joseph,2003
19. Processing Remote Sensing Data, M. C. Girgard and C. Girgard, Oxford-IBH,1999
20. Quantitative Remote Sensing of Land Surfaces, Shunlin Liang, WileyInter science, 2004
21. Scale in Remote Sensing and GIS, D. A. Quattrachi and M. F.Goodchild
22. Theory of Satellite Orbits in an Atmosphere, King-Hele Desmond, Butterworths, 1964
23. Uncertainty in Remote Sensing and GIS, Ed: G. M. Foddy and P. M.Atkinson
24. Remote Sensing by GeorgeJoseph
25. Concepts in Space Sciences Edited by R.R.Daniel
26. Mathematical Principles of Remote Sensing by A..Milman
27. An Introduction to Ionosphere and Magnetosphere, J. A.Raticliffe
28. Solar System Astrophysics, J. C. Brandft and P. W.Hodge
29. Plasma Diagnostic Techniques, R. H. Huddlestone and S. L.Leonard
30. Introduction to Experimental Physics, W. B.Fretter
30. High Vacuum Techniques, J.Yarwood
31. Plasma Diagnostics, Vol. I, O. Anciello and D. L.Flamn
32. The Earth's Ionosphere: Plasma Physics and Electrodynamics, Michael C.Kelley, AcademicPress
33. Ionospheric Techniques and Phenomena, A. Giraud and M. Petit, D. ReidelPublish.
34. Physics of Geomagnetic Phenomena, Vol. I and II, S. Matsushita and W. H. Campbell, AcademicPress

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35. Introduction to Ionospheric Physics, H. Risbeth and H. Garriot, AcademicPress
36. Space Weather, Physics and Effects by Volker Bothmer and Loannis.A.Depli Springer
37. Aerospace Environment by TBeer
38. Free flight of a rocket ByGantmaker
39. Orbital Mechanics, Ed. Vladimir A, Chobotov, AIAA EdnSeries
39. Introduction to Celestial Mechanics, S. W. McCusky,Addison-Wesley
40. Fundamentals of Astrodynamics, R. R. Bates et al,Dover
41. Orbital Motion, A. E. Roy, Adam HinglarLtd
42. Orbital Methods in Astrodynamics, P. R. Escobal, JohnWiley
43. Fundmentals of Astrodynamics, R. R. Bates et al,Dover
44. Orbital Motion, A. E. Roy, Adam HinglarLtd
45. Design of Orbital Flights, J. Johnson et al., McGrawHill
46. Modern Astrophyiscs, B. W. Carroll and D. A. Ostlie, Addison-Wesley
47. The Physical Universe, F. Shu, University ScienceBooks
48. The Physics of Astrophysics, Vol. I and II, F. Shu, University ScienceBooks
49. Theoretical Astrophysics, Vol. I, II and III, T. Padmanabhan, CambridgeUni.Press
50. The Physics of Fluids and Plasmas, Arnab Rai Choudhuri, CambridgeUni.Press
51. Astrophysical Concepts, M. Harwitt,Springer-Verlag
52. Galactic Astronomy, J. Binney and M. Merrifeld, Princeton UniversityPress
53. Galactic Dynamics, J. Binney and S. Tremaine, Princeton UniversityPress
54. Quasars and Active Galactic Nuclei, A. K. Kembhavi and J. V. Narlikar,Cambridge UniversityPress
55. An Introduction to Active Galactic Nucleii, B. M.Peterson

Lab III-A: Materials Science & General

At least ten experiments should be performed from the following list of experiments or parallel level experiment depending upon the facilities available.

1. To determine activation energy of ionic/superionic solid by Temperature depended conductivity measurement.
2. To study Electron Spin(ESR) Resonance in DPPH (Diphenyl Pricyl Hydrazy) sample.
3. To study I-V characteristics of photovoltaic solar cell and find the efficiency.
4. To study the decay of photoconductivity of given sample and find out trap depth.
5. Study of decay of photoluminescence of a given sample.
6. Measurement of electrical conductivity using Impedance Spectroscopy technique.
7. To determine drift velocities of Ag+ ion in AgI from temperature dependence of ionic transference number study.
8. Electrical conductivity of Ball milled/Mechano-chemical synthesized materials.
9. Determination of strength of a given radioactive source.
10. Study of complete spectra of radioactive sources, and study of photo peak efficiency of NaI(Tl) crystal for different energy gamma rays.
11. Structural analysis of powder sample by XRD and particle size determination using Scherrer's formula.
12. FTIR studies of solid samples.
13. Mechanoluminescence of sucrose crystals.
14. Thermoluminescence of irradiated samples.
15. Study of Op-Amp.-IC-741 is inverting/ Non inverting amplifier and draw frequency response curve.

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16. Construction of Schmitt triggers using IC-741 and study of its characteristics.
17. Study of Astable and monostable Multi Vibrator using IC555.
18. Digital electronics experiments on bread board usingIC-7400.

Lab III-B: Astronomy & Astrophysics

1. Study of Quasar.
2. Study of the orbit of a visual binary Star.
3. Determine the mass of Saturn &its rotational velocity.
4. Verification of Hubble's law and determination of Hubble'sconstant.
5. Identification of element from Fraunhoffer spectrum of the sun.
6. Study of sunspots.
7. Study of light curves of Cepheid variable stars.
8. Study of Proper motion of stars.
9. Determination of Pulsar period and distance.
10. Photo-electric photometry of Pleiades star cluster.
11. Study of expansion of the universe and calculate the age of the Universe.

OR III -B: Electronics

(1) Experiments with microprocessor. (a)Convert BCD in to binary & vice versa.
(b) To transfer group of data blocks from one location to another location.
(c) To write programme for addition &subtraction.
(d) To write programme for multiplication &division.
(2) Logic gate study DTL &RTL.
(3) To study& verify the Demerging's Theorem.
(4) Study of Adder/Subtract or.
(5) Study of Encoder &Decoder.
(6) Study of Multiplexer &DE multiplexer
(7) Study of digital to analog converter.
(8) Study of analog to digital converter.
(9) Study of 4-bit Counter/ ripple Counter.
(10) Study of left/right shift register.
(11) Study of read only memory.
(12) Study of Random Access Memory.
(13) Study of Phase locked loop.
(14) Study of BCD to seven segments Decoder.
(15) Study of modulation & demodulation.
(16) Optical fiber based experiment.
(17) Microwave characterization and measurements.

OR III -B: Physics of Nano-material

(1) Synthesis of II-IV semiconductor nanoparticles by Wet chemical method.
(2) Synthesis of nanoparticles (ZrO_2) by Combustion method.
(3) Synthesis of nanoparticles by Sol-gel method.
(4) Synthesis of nanoparticles by Ball milling method.
(5) Synthesis of Quantum cells structures using vacuum coating unit.
(6) Synthesis of nanoparticles using Solid state reaction method.
(7) Measurement of band gap energy and size of the nano particle of II-IV semiconductor using absorption spectrophotometer.
(8) To make the peak analysis of IR transmission spectra of nanoparticle using FTIR

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spectrometer.

(9) Study of effect of capping agent on the size of the nanoparticle during synthesis.

(10) To determine the average particle size of nano materials by XRD using Sherer's formula.

(11) To determine the Hall coefficient and carrier type for a semiconducting nanoparticles.

(12) To determine the Band gap of a given semiconductor using Four probe method from room temperature to 100°C.

(13) To determine the average size of nanoparticles using Zetasizer.

(14) To measure the change of dielectric constant and dielectric loss of nanoparticle with the change of signal frequency by impedance analyzer.

(15) To characterize the mechanical properties by tensile testing.

(16) To estimate the particle size by SEM.

(17) To perform electron diffraction analysis from TEM image.

(18) To do roughness analysis of nanostructured sample using AFM.

OR III -B: Space Physics

1. The flow of energy out of the Sun.
2. Study of Sun-spot.
3. Astrometry of asteroids.
4. Study of expansion of the universe and calculate the age of the Universe.
5. Identification of element from Fraunh offer spectrum of the sun.
7. The transit of Venus and Mercury.
8. Jupiter's Moon and speed of light.
9. Determination of Pulsar period and distance.
10. Photo-electric photometry of Pleiades star cluster.
11. The large scale structure of the Universe.

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Semester – IV
PAPER – I: NUCLEAR AND PARTICLE PHYSICS

Unit-I **Nuclear Interactions:** Nucleon-nucleon interaction, Two-nucleon system, The ground state of the deuteron, Tensor forces, Nucleon-nucleon scattering at low energy, Scattering length, Effective range theory, Spin dependence of nuclear forces, Charge independence and charge symmetry of nuclear forces, Iso-spin formalism, Exchange forces, Meson theory of nuclear forces and the Yukawa interaction.

Unit-II **Nuclear Reactions:** Reaction energetics: Q-equation and threshold energies, Reactions cross sections, Resonance: Breit-Wigner single-level formula, Direct and compound nuclear reactions, Formal reaction theory: Partial wave approach and phase shifts, Scattering matrix, Reciprocity theorem,

Unit-III **Nuclear Decay:** Beta decay, Femi's theory of beta decay, Shape of the beta spectrum, Total decay rate, Angular momentum and parity selection rules, Comparative half-lives, Allowed and forbidden transitions, Selection rules, Parity violation, Two component theory of neutrino decay, Detection and properties of neutrino

Gamma decay, multiple transitions in nuclei, Angular momentum and Parity selection rules, internal conversion, nuclear isomerism.

Unit – IV **Nuclear models:** Liquid drop model, Bohr-Wheeler theory of fission, Shell Model, Experimental evidence for shell effects, Single particle shell model, Spin-orbit interaction and magic numbers, Analysis of shell model predictions, Magnetic moments and Schmidt lines, Collective model of Bohr and Mottelson.

Unit - V **Elementary particle Physics:** The fundamental interactions, Classification of elementary particles, Leptons and Hadrons, Symmetries, groups and conservation laws, SU(2) and SU(3) multiples and their properties, Quark model, Properties of Quarks, the standard model.

TEXT AND REFERENCE BOOKS:

1. A. Bohr and B.R. Mottelson, Nuclear structure, vol. 1 (1969) and vol.2, Benjamin, Reading, A,1975.
2. Kenneth S. Kiane, Introductory Nuclear Physics, Wiley, New York,1988.
3. Ghoshal, Atomic and Nuclear Physicsvol.2.
4. P.H. Perking, Introduction to high energy physics, Addison-Wesley, London, 1982.
5. Shriokov Yudin, Nuclear Physics vol.1 & 2, Mir Publishers, Moscow, 1982.
6. D. Griffiths, introduction to elementary particles, harper and row, New York, 1987.
7. H.A. Enov, introduction to Nuclear Physics, Addison-Wesley, 1973.
8. G,E. Brown and A.D. Jackson, Nucleon-Nucleon interaction North-hall and Amsterdam, 1976.
9. S.D. Benedetti, Nuclear interaction, John Willey and sons, New York, 1964.
10. M.K. Pal, theory of Nuclear structure, affiliated East West, Madras,1982.
11. Y.R. Waghmare, introductory nuclear physics, Oxford, IBH, Bombay,1981.
12. J.M. Longo, elementary particles, McGraw Hill, New York,1971.
13. R.R. Roy and B.P. Nigam, Nuclear Physics, Wiley- Easterm Ltd.1983.

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PAPER – II LASER PHYSICS AND APPLICATIONS

Unit-I Laser Characteristics–

Spontaneous and stimulated emission, Einstein's quantum theory of radiation, theory of some optical processes, coherence and monochromacity, kinetics of optical absorption, line broadening mechanism, Basic principle of lasers, population inversion, laser pumping, two & three level laser systems, resonator, Q-factor, losses in cavity, threshold condition, quantum yield.

Unit – II Laser Systems

Solid state lasers- the ruby laser, Nd: YAG laser, ND: Glass laser, semiconductor lasers – features of semiconductor lasers, intrinsic semiconductor lasers, Gas laser - neutral atom gas laser, He-Ne laser, molecular gas lasers, CO2 laser, Liquid lasers, dye lasers and chemical laser.

Unit-III Advances in laser Physics

Production of giant pulse -Q-switching, giant pulse dynamics, laser amplifiers, mode locking and pulling, Non-linear optics, Harmonic generation, second harmonic generation, Phase matching, third harmonic generation, optical mixing, parametric generation and self-focusing of light.

Unit –IV Multi-photon processes; multi-quantum photoelectric effect, Theory of two-photon process, three- photon process, second harmonic generation, parametric generation of light, Laser spectroscopy: Rayleigh and Raman scattering, Stimulated Raman effect, Hyper-Raman effect, Coherent anti-stokes Raman Scattering, Photo-acoustic Raman spectroscopy.

Unit – V Laser Applications – ether drift and absolute rotation of the Earth, isotope separation, plasma, thermonuclear fusion, laser applications in chemistry, biology, astronomy, engineering and medicine.

Communication by lasers: ranging, fiber Optics Communication, Optical fiber, numerical aperture, propagation of light in a medium with variable index, pulse dispersion.

TEXT AND REFERENCE BOOKS:

1. Laud, B.B.: Lasers and nonlinear optics, (New AgeInt.Pub.1996).
2. Thyagarajan, K and Ghatak, A.K.: Lasers theory and applications (Plenum press, 1981).
3. Ghatak, A.K. and Thyagarajan, K : Optical electronics (Cambridge Univ. Press 1999).
4. Seigman, A.E.: Lasers (Oxford Univ. Press1986)
5. Maitland, A. and Dunn, M.H. : Laser Physics (N.H.Amsterdam,1969).
6. Hecht, J. The laser Guide book (McGraw Hill, NY,1986).
7. Demtroder, W.: Laser Spectroscopy (Springe series in chemical physics vol.5, Springeverlag, Berlin,1981).
8. Harper, P.G. and Wherrett B.S. (Ed.): Non-linear-optics (Acad.press,1977).

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PAPER – III: SOLID STATE PHYSICS- II

Unit- I: **Plasmon's, Polaritons**

Dielectric function of the electron gas, Plasma optics, Dispersion relation for EM wave, Transverse optical modes in Plasma, Transparency of Alkali metals in the ultraviolet, Longitudinal Plasma oscillations, Plasmon, electrostatic screening and screened Coulomb potential, Mott metal-insulator transition, screening and phonons in metals, Polaritons, LST relation.

Unit –II: **Dielectric and ferroelectrics**

Maxwell's equations, polarization, macroscopic electric field, depolarization filed, E1;local electric field at an atom, Lorentz filed E2, fields of dipoles inside cavity E3; dielectric constant and polarizability, electronic polarizability; structural phase transition; ferro-electric crystals, classification; displacive transition, soft optical phonons, Landau theory of phase transitions, first and second order transition, antiferro-electricity, ferro- electric domain, piezoelectricity, ferro-elasticity, optical ceramics.

Unit –III: **Magnetism**

General ideas of dia- and para- magnetisms, quantum theory of paramagnetism, rare earth ions, Hund rule, iron group ions, crystal field splitting, quenching of orbital angular momentum, spectroscopic splitting factor, van vleck temperature dependent paramagnetism, Cooling by isentropic demagnetization, nuclear demagnetization, paramagnetic Susceptibility of conduction electrons.

Unit –IV: **Ferromagnetism and anti-ferromagnetism**

Ferromagnetic order, Curie point and exchange integral, temp dependence of saturation magnetization, saturation magnetization at absolute zero; magnons, quantization of spin waves, thermal excitation of magnons; neutron magnetic scattering, Ferrimagnetic order, Curie temp and susceptibility of ferrimagnets, iron garnets. Antiferromagnetic order, susceptibility below neel temp, antiferromagnetic magnons, ferromagnetic domains.

Unit – V: **Optical Processes &Excitons and defects**

Optical reflectance, excitons, Frenkel and Mott-Wannier excitons, Alkali Halides and Molecular crystals Defects: lattice vacancies, Schottkey and Frenkel point effects, colour centers, F and other centers, Line defect. Shear strength of single crystals, dislocations- edge and screw dislocations, Burger vectors, Stress fields of dislocations, low angle grain boundaries, dislocation densities, dislocation multiplication and slip, strength of alloys, dislocations and crystal growth, hardness of materials.

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TEXT AND REFERENCE BOOKS

1. C. Kittel: Introduction to Solid State Physics (Wiley and Sons).
2. J.M. Ziman: Principles of theory of solids (Cambridgeuniv. press).
3. Azaroff : X-ray crystallography.
4. Weertman and weertman : Elementary Dislocation Theory.
5. Verma and Srivastava: Crystallography for Solid State Physics.
6. Azeroff and Buerger: The Power Method.
7. Buerger: Crystal Structure Analysis.
8. Thomas: Transmission Electron Microscopy.
9. Omar: Elementary solid state physics.
10. Aschroft and Mermin : Solid State Physics.
11. Chalking and Lubensky: Principles of Condensed Matter Physics.
12. Madelung : Introduction to solid state theory.
13. Callaway: Quantum theory of solid state physics.
14. Huang: Theoretical Solid State Physics.
15. Kittel: Quantum theory of solids.

PAPER –IV (A): ASTRONOMY AND ASTROPHYSICS - II

Unit– I The Milky Way Galaxy: Structure of the Milky way, Oort's theory of galactic rotation, Dynamics of the spiral arms, Distribution of Interstellar matter, Central regions of the Milky way. Normal Galaxies: Classification of galaxies, Hubble sequence: Elliptical, Lenticulars and Spiral galaxies, and their properties, Distribution of light and mass in galaxies, Brightness profiles, Distribution of gas and dust in galaxies.

Unit- II Active galaxies: Active Galactic Nuclei (AGNs), Seyfert galaxies, BL Lac Objects, Radio galaxies: General properties, Superluminal motion, Quasars: Properties and Energy requirements, Nature of quasar redshifts, Supermassive black hole model and Unified model of AGNs.

Unit- III Cosmology: Cosmological principle, Observational support and other arguments to support cosmological principle, Fundamental observers and co-moving frame, Robertson-Walker line element (without derivation), Observational features of Robertson-Walker space time e.g. Red shift etc, Models of the universe, Friedmann models, Quantitative predictions of FRW model, Quantitative solutions, Open and closed universes, Hubble's law, Angular size, Source counts, Models with the cosmological constant, Steady state cosmology.

Unit- IV Relics of the big bang, the early universe, Thermodynamics of the early universe, Thermal History, Primordial neutrinos, Helium synthesis and other nuclei, Microwave background, the very early universe, the formation of structures in the Universe, Jeans Mass, Growth Rate, Recombination era, Onset of matter dominated era.

Unit- V Observations of the cosmological significance, Measurement of Hubble's constant, Anisotropy of local large - scale velocity fields, Age of the universe, Abundance of light nuclei, Dark matter, the redshift-magnitude relation, Number counts of extragalactic objects, The variation of angular sizes with distance.

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TEXT AND REFERENCE BOOKS:

1. Astrophysics for Physicists, Arnab Rai Choudhuri, Cambridge Uni.ty Press,2010.
2. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison-Wealey Pub.Co.
3. Introductory Astronomy and Astrophysics, M. Zeilik and S.A. Gregory, 4th edition, Saunders college publishing.
4. Theoretical Astrophysics, vol. – II: Stars and stellar systems, T. Padmanabhan, Cambridge university press.
5. The Physical universe: An introduction to astronomy, F. Shu, Millvalley: University science books.
6. Textbook of astronomy and astrophysics with elements of cosmology, V.B. Bhatia, Pb -New Delhi, Narosa publishing house.
7. The new cosmos, A. Unsold and B. Baschek, Newyork, Springer Velas.
8. Quasars and active galactic neuclei, A.K. Kembhavi and J.V. Narlikar, Cambridge university press.
9. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison Wesley publish.co.
10. Introductory astronomy and astrophysics, M.Zeilik and S.A.Greogry, 4 th edition, Saunders college publishing.
11. Theoretical Astrophysics, vol. I: Astrophysical processes T. Padmanabhan, Cambridge university press.
12. Introduction to cosmology, J.V. Narlikar, 3 rd edition, Cambridge uni. press.
13. Structure formation in the universe, T. Padmanbhan, Cambridge University, press.
14. General relativity and cosmology, J.V. Narlikar-Delhi: Macmil. Comp.of Indialtd.
15. Galactic Astronomy: Binney and Merrifield.

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Paper – IV (B) Electronics II (Communication)

Unit-I **Digital communications**

Pulse modulation systems, Sampling Theorem, Low pass &Band pass signal, PAM- Channel BE for PAM signal, Natural Sampling, Flattop sampling, Signal through holding, Quantization of signals, quantization error.

Unit-II **Digital modulation techniques**

PCM, Differential PCM, Delta modulation, Adaptive, delta modulation (CVSD). BPSK, DPSK, QPSK, PSK, QASK, BFSK, FSK, MSK

Unit-III **Mathematical representation of noise**

Sources of noise, Frequency domain representation of noise, Effect of filtering on the probability density of Gaussian noise, Spectral component of noise, Effect of a filter on the power spectral density of noise, Superposition of noise, Mixing involving noise, binear filtering, Noise bandwidth, Quadrature component o f noise, Power spectral density of nc(t) n_s (t) & their time derivatives.

Unit-IV **Data Transmission I**

Base band signal receiver, Probability of error optimum filter, White noise: Matched filter & probability of error, Coherent reception correlation, PSK, FSK, Non-Coherence detection on FSK, Differential PSK, QASK, Calculation of error probability for BPSK, BSFK, QPSK.

Unit-V **Data Transmission II**

Noise in pulse code & delta modulation system, PCM transmission, Calculation of quantization noise output signal power, Effect of thermal noise, output signal to noise ratio in PCM, DM, Quantization noise in DM, output signal power, DM output signal to quantization noise ratio, effect of thermal noise in delta modulation, output signal to niose ratio in DM

Text and Reference Books:

1) "Microwaves" by K.L. Gupta Wiley Estern Ltd. Delhi.
2) Advanced Electronic communication system by Wayne Tomsi Physics education.
3) Principle of communication of system-by Toub & Schilling: second edition TMH 1994
4) Communication system: by siman Haykin, third edition John wiley & sons inc.1994.
5) Microwave devices & cktsby: Samuel, Y. Liau.
6) Electronic communication: George kennedy.

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Paper – IV (C) PHYSICS OF NANO MATERIALS- II

UNIT I: **Synthesis of Nano-materials**

Top-down & Bottom-up approaches: Kinetically confined synthesis of nanoparticles: micro emulsion and spray pyrolysis. Template based synthesis: Electrochemical deposition, Physical Vapour deposition, Chemical Vapour deposition, Electron Beam Lithography (EBL), X-ray Lithography (XRL).

Chemical Route synthesis of Nanomaterials: Chemical precipitation and co- precipitation, Chemical Bath Deposition (CBD), Sol-gel, Combustion technique.

UNIT II: **Characterization of Nano-materials (a)**

X- ray Diffraction (XRD), powder and single crystal Diffraction, X-ray fluorescence (XRF), X ray photoelectron spectroscopy (XPS), Energy Dispersive X-ray analysis (EDAX), Thermo analytic Methods: Thermo Gravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC), Differential Thermal Analysis(DTA).

UNIT III: **Characterization of Nano-materials (b)**

Scanning Tunneling Microscopy (STM), Contact and non-contact Atomic Force Microscopy (AFM), Conductive AFM. Scanning Electron Microscopy (SEM), Transmission electron microscopy (TEM), High resolution TEM Field emission SEM. Spectrophotometer: UV-Vis spectrophotometers, IR spectrophotometers, Fourier Transform Infrared Radiation (FTIR), Photoluminescence (PL), electroluminescence and thermoluminescence spectroscopy.

UNIT IV: **Applications of Nano-materials**

Quantum wells, wires and dots. Organic Semiconductors, Organic Light Emitting Diodes (OLEDs), self-assembly of complex organic molecules, molecular switches, thermochromic switches, Motor molecules and bio-mimetic components, charge transfer complexes, molecular connections, contact issues, conducting polymers, light emitting polymers, polymer-polymer heterostructures, plastic FETs, photodiodes &solar cells. Nano Robotics: Nano robots and NEMS, Sensors and actuators, Artificial molecular machines, Biomotors, Other Nano machines, Propulsion, Control, Communication, Programming and coordination.

UNIT V: **Nano Sensors and Biomedical applications**

Nanosensors: Gas sensors, Pollution sensor, Photo sensor, Temperature sensor, IR detector, Biosensor, nanomaterial gas discharge devices, CNT based fluid velocity sensor. Nanoparticle in Drug delivery, Targeting Legends, Cancer Treatment, Mediated Delivery of Sirna, Nanonephrology, Nanosystems in Inflammation, Targeting Macrophages to Control Inflammation, Tissue Regeneration, Growth And Repair, Tissue Bioengineering, Future Understanding for Treatment, nanosurgery, Drug Delivery Technology Significance, Impact and Development.

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References: Books/ Research Monographs

1. Nanostructures & Nanomaterials: Synthesis, Properties & Applications: Guozhang Cao.
2. Introduction to Nanotechnology: Charles P. Poole Jr and Franks J. Qwens.
3. Handbook of Analytical instruments, R.S. Khandpur
4. Nano materials: Synthesis properties ,characterization and application: A.S Edelstein and R.CCammaratra
5. Nano electronicsand Nanosystems. Karl Goser, Peter Glosekotter, Jan Dienstuhl.,
6. Springer,2004
7. Nanomaterial Systems Properties and Application, A.S.Eldestein and R.C.Cammarata.
8. Handbook of Nanotechnology: Bhushan(Ed), Springer Verlag, New York(2004).
9. Nanocomposite Science and Technology, Ajayan, Schadler and Braun
10. Piezoelectric Sensors: Force, Strain, Pressure, Acceleration and Acoustic Emission
11. Sensors, Materials and Amplifiers, G. Gautschi.
12. Block Copolymers in Nanoscience Massimo Lazzari
13. Supramolecular Chemistry, Jonathan W. Steed, Jerry L. Atwood
14. Nanotechnology: Importance and Application by M.H. Fulekar, IK International, 2010.
15. Nanotechnology in Biology and Medicine: Methods, Devices and Application by Tuan Vo-Dinh, CRC press,2007.
16. Nano system characterization tools in the life sciences by Challa Kumar. Wiley- VCH,
17. 2006.
18. Nanolithography M.Gentili etal.(edits),Springer.
19. Environanotechnology by Mao Hong fan, Chin-pao Huang, Alan E Bland, Z Honglin
20. Wang, RachidSliman, Ian Wright. Elsevier,2010.
21. Nanotechnologies, Hazards and Resource efficiency by M. Steinfeldt, Avon Gleich, U. Petschow, R. Haum. Springer, 2007.
22. Nanotechnlogy: Health and Environmental risk by Jo Anne Shatkin. CRC press, 2008.
23. An Introduction to Quantum Computing Phillip Kaye, Raymond Laflamme, Michele
24. Mosca
25. The Physics of Quantum Information: Quantum Cryptography, Quantum
26. Teleportation, Quantum Computation by Dirk Bouwmeester, Artur K. Ekert,Anton
27. Zeilinger
28. Problems and Solutions in Quantum Computing And Quantum Information Yorick Hardy Willi-HansSteeb

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PAPER –IV (D): SPACE PHYSICS – II

Unit I: **Glimpse of Universe**

Universe - description, origin, its evolution, age and size; Stars–birth, life, death, spectral analysis, stellar composition - element synthesis in stars, Exotic stars- novae, supernovae, pulsars, black holes and gamma ray bursts; Galaxies; Starbursts and Active Galactic Nucleus; Evidence for the Big Bang; Cosmic Background Radiation; Expansion Models; Dark Matter and Energy Recent innovations about the concept of Universe: Dark Energy and an accelerating universe

Unit II: **Spacecraft& Satellites**

Satellite orbits and attitude: principles of satellite motion, Kepler's laws, orbital elements, satellite attitude and its control, types of orbits, polar and geostationary, earth and Sun-synchronous, orbit optimization, viewing geometry, launch vehicles and spacecraft, rocket propulsion concepts such as solid, hybrid, liquid, nuclear and antimatter. Rocket motors and their design, flight stability and recovery systems, stability and control system.

Unit III: **Remote Sensing**

Sensors and systems: visible, infrared, water vapour and microwave sensors, sensor characteristics, sensor materials, passive and active sensors, scanning radiometers, spectral signatures.

Satellite data processing: satellite data acquisition, satellite communications, data collection platforms, earth station, image processing, geometric and radiometric corrections, image navigation, registration, image enhancement techniques, noise removal methods, histogram methods, density slicing, image classification.

Applications of remote sensing in earth resources management, agriculture, forestry, water resources and disaster mitigation

Unit IV: **Solar Wind and Interactions**

The ionospheric layers D, E, F and their formation, effect of radiation on earth's atmosphere, photochemical processes,

Geomagnetic and magnetic coordinates, poles, measurement of geomagnetic field components, micro pulsation indices, variations of geomagnetic field, quiet and disturbed variations and geomagnetic storms, equatorial and auroral phenomena.

Solar wind, model of solar winds, interaction in the interplanetary medium and with the planets. Magnetosphere: interaction of solar wind with the geomagnetic field and formation of the magnetospheric tail, storm and sub-storm phenomena, Van Allen radiation belts

Unit V: **Space Weather**

Space Weather Effects on Communication, Space Weather Effects on Power Grids, Space Radiation Protection, Effects on Spacecraft's hardware and Operations, Effects on Satellite Navigation, Forecast of Space Weather.

Text and Reference Books

Same as mentioned in Semester III, Paper IV (D)

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