Roll No. .....

DD–753

M. Sc. (Fourth Semester)
EXAMINATION, 2020

PHYSICS

Paper Third

(Solid State Physics—II)

Time : Three Hours

Maximum Marks : 80

Note : Attempt all the *five* questions. *One* question from each Units is compulsory. All questions carry equal marks.

Unit—I

1. Define dielectric function. Find out dispersion relation for electromagnetic wave.

Or

Define Plasmas and explain the transverse optical modes in plasma.

Unit—II

2. What is meant by polarization in dielectrics ? Obtain the relation between dielectric constant and atomic polarizability.

Or

Discuss in detail the theory of ferroelectric domain.

Unit—III

3. Give the quantum theory of paramagnetism. Discuss, how the theory explains the behaviour of rare earth ions.

Or

Write notes on the following :

(a) Van Vleck temperature dependent paramagnetism

(b) Spectroscopic splitting factor

Unit—IV

4. What do you mean by magnons ? Explain thermal excitation of magnons.

Or

Define saturation magnetization and also explain Curie point and exchange interaction of magnetic materials.

Unit—V

5. Differentiate between Defects and Dislocations. Explain in brief the edge and screw dislocations.

Or

What do you mean by Frenkel defect ? Show that number of Frenkel defects in equilibrium at a given temperature is proportional to $(NN_i)^{1/2}$, where N is the number of atoms, N_i is the number of interstitial atoms.