Code No: R101714

PHYSICS OF SOLIDS

Time: 3 hours **Max.Marks:100**

Answer any FIVE questions
All questions carry equal marks
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1.a) Explain lattice point and space lattice. Distinguish between unit cell and primitive cell.
b) Discuss the simple crystal structures of Zinc sulphide and cesium oxide. [10+10]

2.a) Write a note on point defects. Obtain the expression for equilibrium concentration of Frenkel defects in ionic crystals.
b) Discuss allotropy and polymorphism. [10+10]

3.a) Write the motion of electron in one dimensional periodic potential (Kronig-Penneymodel).
b) Discuss the classification of metals, insulators and semiconductors basing on Kronig-Penney model. [10+10]

4.a) Drive the expression for internal field in dielectric material.
b) Deduce the Clausius-Mosotti equation and discuss importance of this equation. [10+10]

5.a) What is Hall effect. Derive the theoretical expression for Hall coefficient.
b) Explain how the Hall mobility is determined experimentally. [10+10]

6.a) Distinguish between perfect conductor and super conductor and discuss Meissner effect.
b) Write the theory of AC and DC Josephson effects. [10+10]

7.a) Describe the mechanism of conduction in semiconductors.
b) Obtain the expression for carrier concentration in valence band of a intrinsic semiconductor. [10+10]

8. Answer the following:
a) Lattice energy in ionic crystals
b) Ferroelectricity and piezo electricity
c) Application of super conductors [7+7+6]

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