Roll No. ....

Total Pages : 02

BT-2/M-18   32002

PHYSICS-II

PHY-102E

Time : Three Hours]   [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) Explain different types of crystal bonding.   10
    (b) What do you mean by Miller Indices ? Explain with proper example how to determine Miller Indices.   5
    (c) Draw Cesium Chloride Structure.   5

2. (a) What are Schottky and Frenkel defects ? Derive the necessary relation to show that Schottky defect ion ionic crystal depends on temperature.   15
    (b) Write note on X-ray diffraction.   5

Unit II

3. (a) Derive an expression for time dependent Schrödinger wave equation.   10
    (b) Write a note on discovery of Planck's constant. 10

4. (a) Obtain an expression for density of states.   10
    (b) Dicuss classical free electron theory of metal.   10

Unit III

5. (a) Construct two dimensional Brillouin zones.   10
    (b) Write a note on origin of energy bands.   10

6. (a) What do you understand by the concept of effective mass and holes ?   10
    (b) What is Hall Effect ? Give an elementary theory of Hall effect. Mention applications of Hall effect. 10

Unit IV

7. (a) What is Photoconductivity ? Discuss simple model of a photoconductors.   10
    (b) Discuss London equations with reference to superconductivity.   10

8. (a) Derive an expression for diamagnetic susceptibility on the basis of Langevin theory and show it is independent of temperature.   10
    (b) Explain photovoltaic cells and their characteristics.   10