Roll No. ........................

Total Pages : 2

BT-2/M-14

**8202**

# PHYSICS-II

Paper—PHY-102-E

Time Allowed : 3 Hours]          [Maximum Marks : 100

**Note :** Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

## UNIT-I

1. (a) Discuss the Laue X-ray diffraction method for the crystal structure analysis. 10

   (b) Prove that lattice cannot have five fold symmetry. 10

2. (a) Differentiate between Schottky and Frenkel defects in the crystal. 5

   (b) Discuss the Bravais lattice in three dimensions. 15

## UNIT-II

3. (a) Explain Drude's theory of conduction. 10

   (b) Derive the expression for time dependent Schroedinger wave equation. 10

4. (a) Derive an expression for the Fermi energy of a free electron gas in one dimensions. 10

   (b) Discuss the behaviour of Fermi-Dirac distribution function with change in temperature. 10

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## UNIT-III

5. (a) On the basis of band theory of solids distinguish between metals, insulators and semiconductors. 10

   (b) What do you mean by effective of electron and find a relation for it. 10

6. Explain the phenomena of Hall effect in solids and gives its applications. 20

## UNIT-IV

7. (a) Explain the applications of photoconductivity and discuss the effect of traps. 10

   (b) Explain the molecular field theory of ferromagnetism and formation of domains. 10

8. (a) Explain the orbital dimagnetism and show that diamagnetic materials have negative magnetic susceptibility. 10

   (b) State and derive London equations. 10

8202/K/1314/22,300          2