

PHY2-2011-1 MAY

Roll No.

Total Pages : 2

Exam. Code

6013

8056

BT-2/M-11

PHYSICS-II (2005 Onwards)

Paper : Phy-102(E)

Time : Three Hours]

[Maximum Marks : 100

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

UNIT-I

1. (a) What are Miller indices ? Give their significance. How would you determine the Miller indices of a plane in a crystal ? 12
- (b) Explain bonds in Solids. 8
2. (a) What are X-rays ? Explain the mechanism of the origin of continuous and characteristic X-rays. Explain Lave method for crystal structure determination. 12
- (b) Explain point defects in solids. 8

UNIT-II

3. (a) Explain Group velocity and Phase velocity. Derive expression for time dependant Schrödinger wave equation. 12
- (b) What is Planck's constant ? Explain its significance. How it can be determined ? 8

4. (a) Define Fermi energy. Give the expression for Fermi-Dirac distribution law, clearly explaining the symbols used. 10
- (b) What is Thermionic work function ? Derive the expression for Richardson's equation. 10

UNIT-III

5. (a) Discuss the origin of energy bands in solids. How can you distinguish between metals, semiconductors and insulators on the basis of energy bands ? 10
- (b) Explain E-K diagrams and Brillouin zones. 10
6. Write notes on the following :
- (i) Hall effect.
- (ii) Effective mass. 10+10

UNIT-IV

7. (a) Distinguish between Diamagnetism and Paramagnetism, and obtain the expression for Langevin's equation for Paramagnetism susceptibility. 12
- (b) Discuss Photo-voltaic cells and their characteristics. 8
8. Write notes on any *two* of the following :
- (i) Superconductivity.
- (ii) Photo-conductivity.
- (iii) London equation. 10+10