Roll No. ....

Exam. Code
6013

Total Pages : 2

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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 Laue 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

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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

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