Code No: 51004

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year Examinations, May - 2016
ENGINEERING PHYSICS
(Common to CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MCT, ETM, MMT, AE, BT, AME, MIE, PTE, MSNT, AGE)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks

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1.a) What are the properties of covalent bond solids?
 b) Classify the crystal systems on the basis of lattice parameters.
 c) Calculate the packing factor for SC, BCC and FCC lattices.   [4+6+5]

2.a) State and explain Bragg's law.
 b) Derive the formula for concentration of Frenkel defects.
 c) Write a note on edge and screw dislocations.   [4+6+5]

3.a) What are the salient features of Fermi – Dirac statistics?
 b) Describe Davisson and Germer experiment and explain the results.
 c) What is the significance of wave function?   [5+6+4]

4.a) Describe the behavior of electron in a periodic potential.
 b) Discuss the salient features of Kronig penney model.
 c) Explain the concept of effective mass of an electron.   [5+6+4]

5.a) Derive the carrier concentration of an intrinsic semiconductor.
 b) Discuss PN junction diode as a rectifier.
 c) Distinguish between direct and indirect band gap semiconductors.   [6+6+3]

6.a) Define the terms dielectric constant, polarizability and displacement vector.
 b) Derive Classius – Mossotti equation.
 c) Explain Hysteresis curve on the basis of domain theory.   [3+6+6]

7.a) Distinguish between spontaneous and stimulated emission.
 b) Describe the construction and working of semiconductor laser.
 c) Distinguish the characteristics of step index and graded index fiber.   [4+6+5]

8.a) What is reverberation? Explain Sabine's formula.
 b) Describe the method to measure the absorption coefficient of a material.
 c) Explain the factors effecting architectural acoustics and their remedies.   [6+5+4]

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