R07

Code: R7100203

B.Tech I Year (R07) Supplementary Examinations December/January 2015/2016
APPLIED PHYSICS
(Common to EEE, ECE, CSE, EIE, BME, IT, E.Con.E, ECC & CSS)
(For 2008 Regular admitted batch only)

Time: 3 hours   Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

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1 (a) Define space lattice.
   (b) Briefly explain the seven crystal systems.
   (c) What is coordination number? Calculate the co-ordination number for simple cubic and body centered cubic lattices.

2 (a) What is De Broglie hypothesis?
   (b) Show that the De Broglie wavelength for electron is found to be equal to $\frac{12.26}{\sqrt{V}}$ $A°$.
   (c) Derive time independent Schrodinger's wave equation.

3 (a) Explain the Fermi-Dirac distribution function of electrons.
   (b) Based on free electron theory, derive an expression for electrical conductivity of metals.

4 (a) Explain Clausius-Mossotti relation in dielectrics subjected to static fields.
   (b) Write a note on hysteresis. Explain hard and soft magnetic materials.

5 (a) What are intrinsic and extrinsic semiconductors?
   (b) Obtain equation for drift and diffusion current densities of electrons and holes.
   (c) Explain Meissner effect in super conductors.

6 (a) Explain the working of He-Ne laser.
   (b) What is population inversion? Write the difference between spontaneous and stimulated emission of radiation.

7 (a) Explain the construction of an optical fiber with neat diagram and write applications of fiber.
   (b) Derive an expression for numerical aperture in optical fiber.

8 (a) What is nano size of materials? Write a note on top down and bottom up methods to synthesize nanomaterials.
   (b) Write a note on carbon nanotubes.

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