Code: R7100203

R07

B. Tech I Year (R07) Supplementary Examinations, December 2012

APPLIED PHYSICS

(Common to EEE, ECE, CSE, EIE, BME, IT, E.Con.E, ECC and CSS)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions

All questions carry equal marks

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1 (a) State and explain Bragg's law of X-ray diffraction.
(b) Describe Laue's method for determination of crystal structure.
(c) The Bragg's angle for reflection from the (1 1 1) plane in FCC crystal is 19.2^0 for an X-ray wavelength of 1.54 Å. Compute the cube edge of the unit cell.

2 (a) Obtain the expression for the wavelength of matter waves.
(b) Show that the wavelength associated with an electron of mass 'm' and kinetic energy É is given by $\lambda = \frac{h}{\sqrt{2mE}}$
(c) Distinguish between matter waves and electromagnetic waves.

3 (a) Give an account of the band theory of solids based on the Kronig-Penny model.
(b) Distinguish between conductors, semiconductors and insulators.

4 (a) Distinguish between Dia, Para and Ferromagnetism.
(b) Explain the hysteresis loop observed in ferromagnetic materials. What are hysteresis losses?
(c) Find the relative permeability of a ferromagnetic material if a field of strength 210 amp/m produces a magnetization 3300 amp/m in it.

5 (a) What is superconductivity? Discuss the parameters that destruct the superconductivity.
(b) Explain Josephson's effect of superconductivity.
(c) Write notes on any four applications of superconductors.

6 (a) Explain the purpose of an active medium in a laser.
(b) With the help of suitable diagram, explain the principle, construction and working of a He-Ne laser.
(c) Calculate the wavelength of emitted radiation from GaAs which has a band gap of 1.44 ev.

7 (a) Distinguish between photography and holography.
(b) Explain in detail the construction and reconstruction of a hologram.

8 (a) Write notes on properties and preparation of nano materials.
(b) What are applications of nano materials?

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