PVP 14

Code: CE2T3, CS2T3, IT2T3

I B.Tech - II Semester – Regular/Supplementary Examinations - May 2017

ENGINEERING PHYSICS
(Common for CE, CSE & IT)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1.

a) The kinetic energy of an electron of wavelength 3×10^{-8}m in terms of eV is?

b) A particle is trapped in one dimensional box of width $2X10^{-9}$m along x-axes. What is the Eigen value of the particle, if the particle is present in its 2^{nd} energy level.

c) The miller indices of a plane that makes intercepts of a, 2b, and 5c on the crystallographic axes of an orthorhombic crystal.

d) The Bragg's angle of diffraction for its second order (110) reflection of cubic crystal of rock salt with lattice parameter 2.81A$^\circ$, if X-rays of wavelength 0.71A$^\circ$ are used?

e) What is the lattice parameters configuration of a Tetragonal and Hexagonal crystal system?

f) Define polarisation and polarisability**.**

g) Define Internal Field in Dielectric materials.
h) What are distinguishing features of ferromagnetism?
i) What is spontaneous emission in LASERS?
j) List any two attenuations in Optical fibers.
k) Describe Nano tubes.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) What is Heisenberg's uncertainty principle? 3 M

b) Explain the matter waves. Describe how G.P Thomson experiment was verified the existence of matter waves.

8 M

c) Explain the physical significance of wave function. 5 M

3. a) What is Bravais lattice? Give the lattice parameters configuration of fourteen Bravais lattices among the seven crystal systems and draw any three of them neatly. 8 M

b) What are miller indices and their significances? 4 M

c) Show that in a simple cubic lattice; inter planar spacing between the successive lattice planes (100), (110) and (111) are in the ration of 1:0.71:0.58. 4 M

4. a) Explain the Bloch Theorem. 5 M

b) Give the qualitative treatment of Kroning-Penny model for energy bands. Based on the band theory of solids, distinguish between conductors, semiconductors and insulators. 11 M

5. a) Write a short note on soft and hard magnetic materials. 6 M

b) Derive the expression for the drift and diffusion currents. 6 M

c) Derive the Einstein relations. 4 M

6. a) Illustrate construction and working of He-Ne Gas laser. Write any two applications of laser? 10 M

b) Derive the expression for acceptance angle and Numerical Aperture in Optical Fibers. 6 M