B.Tech I Year I Semester (R15) Supplementary Examinations June 2016

ENGINEERING PHYSICS

(Common to CE, EEE and CSE)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Explain why Newton's rings appear as circular rings.
(b) What principle behind the functioning of an optical fiber? And write the formula for critical angle.
(c) Define Piezoelectric effect.
(d) Identify whether unit cells of SC, BCC, and FCC lattices are primitive or not. Explain with reason.
(e) Give the physical significance of wave function related to quantum mechanics.
(f) Write the drawbacks of classical free electron theory.
(g) Explain Fermi level in intrinsic semiconductors at 0K.
(h) What are Ferro magnetic materials? Why do they exhibit spontaneous magnetization?
(i) Write any two applications of nano-materials.
(j) Explain Meissner effect.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Determine the radius of curvature of Plano-convex lens using Newton's rings method.

OR

3 With the help of suitable diagrams, explain the principle, construction of a He-Nelaser.

UNIT – II

4 Show that FCC is the most closely packed of three cubic structures.

OR

5 (a) Monochromatic X- rays of Wavelength 1.5 A^0 are incident on a crystal face having an interplanor spacing of 1.6 A^0. Find the highest order for which Bragg's reflection maximum can be seen.
(b) Derive the expression for inter planar spacing between two adjacent planes of miller indices (h k l) in a cubic lattice of edge length 'a'.

UNIT – III

6 (a) Calculate the wavelength associated with an electron with energy 2000eV.
(b) Show that the energies of a particle in a potential box are quantized.

OR

7 Discuss the formation of allowed and forbidden energy bands on the basis of the Kronig-Penney model.

UNIT – IV

8 (a) Explain the Hall Effect? Derive expression for hall coefficient and its importance.
(b) Write a note on Direct and Indirect Band gap semiconductors.

OR

9 Define magnetic moment. Explain the origin of magnetic moment at the atomic level.

UNIT – V

10 (a) Describe the BCS theory of superconductivity.
(b) A super conducting tin has a critical temperature of 3.7 K at zero magnetic field and a critical field of 0.0306 Tesla at 0K. Find the critical field at 2K.

OR

11 (a) Discuss various physical properties of nanomaterials.
(b) Discuss briefly about chemical vapour deposition method of nanomaterials preparation.

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