Code No: PH 1501 **R14**

I B. Tech. II Semester Regular Examinations, June 2015

ENGINEERING PHYSICS

(Common to Electronics and Communication Engineering, Computer Science and Engineering and Information Technology)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.

Answer any **FOUR** questions from **Part-B.**

PART-A

6 ×2 = 12M

1. What is meant by double refraction in crystals?
2. Compare stimulated and spontaneous emission in atomic energy levels.
3. Distinguish between unit cell and a primitive cell.
4. Define magnetic permeability and write S.I. units for magnetic permeability.
5. Explain Hall effect.
6. What are matter waves?

PART-B

4×12 = 48M

1. a) Derive an expression for maxima and minima intensity due to interference of reflected light from surface of a thin film. (8M)
   b) What are quarter wave plate and halfwave plate? (4M)
2. a) Explain construction and working of He – Ne Laser. (6M)
   b) Discuss the types of optical fibers based on refractive index profile. (6M)
3. a) Derive an expression for inter planar spacing in terms of lattice parameters and find the ratio $d_{100} : d_{110} : d_{111}$ in case of a simple cubic system. (8M)
   b) Derive Bragg's condition for x-ray diffraction at a crystal. (4M)
4. a) What are super conductors and explain Meissner effect? (6M)

b) Explain origin of atomic magnetic moment and calculate the numerical value of atomic Bohr magneton. (6M)

5. a) Derive an expression for concentration of electrons in n-type semiconductor. (8M)
   b) Explain direct and indirect band gap semiconductors. (4M)

6. a) Derive expressions for wave functions, probability densities and energies for a particle in an infinite potential box. (9M)
   b) What are the assumptions of classical free electron theory? (3M)

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