H.T.No.										

Code No: PH1501 **GEC-R14**

I B. Tech II Semester Regular/Suppl. Examinations, May 2016

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.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. Calculate the thickness of a wave plate to produce circularly polarized light for wavelength of 5893 x 10^{-10} m. Take μ_o = 1.486 and μ_e = 1.658.
2. What is the principle behind propagation of light in optical fibers.
3. Distinguish between amorphous and crystalline solids.
4. Super conductor exhibits perfect diamagnetism. Prove the statement.
5. Does P-type semiconductor have more positive charge associated? Explain.
6. What is the purpose of Active medium in LASERS?

PART-B

4 × 12 = 48M

1. a) Discuss the phenomenon of interference of light due to thin films of uniform thickness and find the condition of maxima and minima. (8M)

   b) A parallel beam of light (λ = 5890 X 10^{-8} cm) is incident on a thin glass plate (μ=1.5) such that the angle of refraction into the plate is 60^0. Compute the smallest thickness of the glass plate which will appear dark by reflection. (4M)

2. a) Explain the different types of optical fibres along with the refractive index profile and mode propagation sketches. (8M)

   b) Explain the characteristics of lasers. (4M)

3. a) Derive the expression for inter planar distance in cubic crystals. What are the characteristics of Miller indices? (8M)

   b) What is the angle at which the third order reflection of X-rays of 0.79 x 10^{-8} cm wavelength can occur in a calcite crystal of 3.04 x 10^{-8}cm spacing. (4M)

4. a) Derive the expression for the field experienced by an electron inside a dielectric. (8M)

b) Draw and explain the B-H curve for a ferromagnetic material placed in a magnetic field. (4M)

5. a) State Hall effect. With a neat diagram derive the expression for Hall coefficient. (6M)

b) Obtain an expression for number of electrons per unit volume in the conduction band of an intrinsic semiconductor. (6M)

6. a) What is Fermi Dirac distribution function? What is the significance of Fermi Dirac distribution function? (4M)

b) Show that when an electron travels in periodic potential provided by the lattice, it experiences allowed energy bands separated by forbidden regions. (8M)

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