MODEL PAPER

Subject Code: R161104/R16 **Set No - 1**

I B. Tech I Semester Regular Examinations Nov. - 2016

APPLIED PHYSICS

(Common to ECE,CSE,IT,EIE,EComE)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is **Compulsory**,
Four Questions should be answered from **Part-B**

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PART-A

1. (a) Write any two applications of an interferometer.
   (b) Why is diffraction of light not evident in daily life?
   (c) What are the conditions for light amplification?
   (d) Explain briefly physical significance of the curl of a vector field.
   (e) Calculate the de-Broglie wavelength of a 0:3 kg cricket ball with a speed of 120km/hr.
   (f) Explain diffusion current in semiconductor.
   (g) Explain why a restricted particle cannot have zero energy.

[7 x 2 = 14]

PART-B

2. (a) Describe Newton's rings method for measuring the wavelength of monochromatic light and refractive index of a liquid with necessary theory.
   (b) When the moveable mirror of Michelson's interferometer is moved through 0.05896 mm, a shift of 200 fringes is observed. What is the wavelength of light used?

[10+4]

3. (a) Explain qualitatively Fraunhofer diffraction due to a double slit. How does its intensity distribution curve differ from that obtained due to a single slit?
   (b) Obtain an expression for the resolving power of a grating.

[10+4]

4. (a) Describe the construction of a Nicol's prism. Explain how it can be used as a polarizer and as an analyzer?
   (b) Differentiate between spontaneous and stimulated emission of radiation.

[10+4]

5. (a) State and prove Stokes theorem.
   (b) State and explain Maxwell's equations.

[10+4]

6. (a) Discuss quantum free electron theory. Obtain an expression for electrical conductivity by considering the quantum effects.
   (b) Find the temperature at which there is 1 percent probability that a state with energy 0.5eV above the Fermi-energy will be occupied by an electron.

[10+4]

7. (a) Derive an expression for Hall coefficient in semiconductors and explain the any four of its applications.
   (b) Explain Bloch's quantum theory of electrical conduction.

[10+4]

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