

Subject Code: R13203/R13

Set No - 1

I B. Tech II Semester Supplementary Examinations April/May - 2017 ENGINEERING PHYSICS

(Com. to CE, ME, CSE, PCE, IT, CHEM, AE, AME, MM, PE, MTE, TE)

Time: 3 hours Max. Marks: 70

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

PART-A

- 1. (a) What is polarization? Explain double refraction in crystals.
 - (b) What are Bravais lattices? Define primitive cell and unit cell.
 - (c) What are SQUIDS?
 - (d) Convert Maxwell's first equation (Gauss law of electrostatics) from integral to differential form.
 - (e) What is meant by Fermi energy? What is its physical significance?
 - (f) Distinguish between intrinsic and extrinsic semiconductors.

[3+4+4+3+4+4]

PART-B

- 2. (a) Explain the concept of interference in thin films with necessary theory.
 - (b) In Newton's rings experiment, diameter of 10th dark ring in air when viewed under reflected light of wavelength 6000A° is 0.5 cm. Find the radius of curvature of the lens.
 - (c) Distinguish between Type-I and Type-II superconductors.

[8+4+4]

- 3. (a) Explain the principle of propagation of light through optical fiber.
 - (b) Derive an expression for acceptance angle and numerical aperture of an optical fiber.
 - (c) Calculate the number of atoms per unit cell, atomic radius, coordination number and packing factor for Body Centered Cubic structure. [4+8+4]
- 4. (a) Derive an expression for the internal field in dielectric solid materials.
 - (b) Write short notes on LED and solar cell.

[8+8]

- 5. (a) State and explain Sabine's formula for reverberation time of a hall.
 - (b) Derive the Schrodinger's time independent wave equation.

[8+8]

- 6. (a) Explain the meaning of density of states. Derive an expression for the number of allowed states per unit volume of a solid.
 - (b) Draw and explain B-H curve for a ferromagnetic material.

[8+8]

- 7. (a) Derive an expression for the charge density in terms of Hall voltage and further explain how the mobility of the charge carriers can be evaluated by knowing the conductivity.
 - (b) A 100μm thick sample of silicon is doped with 10²⁸ phosphorous atoms/m³. Find the Hall voltage in the sample if it carries a current of 1mA and is placed in a magnetic field of 0.1Wb/m² (assume electron mobility=0.07m²/V.s).
 - (c)Distinguish between interference and diffraction.

[8+4+4]