Code No: **R201103** **R20** **SET - 1**

I B. Tech I Semester Supplementary Examinations, July/August-2023

ENGINEERING PHYSICS

(Common to CE, ME, Agri. E, Pharm.E)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) What is Interference of Light? What are the conditions for clear vision of interference fringes? [4M]
   b) With ray diagram discuss the theory of thin films and derive the condition for constructive and destructive interference in the case of reflected system. [10M]

(OR)

2. a) Differentiate between interference and diffraction intensity patterns. How do you differentiate the Fresnel diffraction to that of Fraunhofer diffraction? [10M]
   b) How many orders will be visible, if the wavelength of light is 5000Å? Given that the number of lines per centimeter on the grating is 6655. [4M]

UNIT-II

3. a) Explain Einstein's coefficients and derive relation between them. [7M]
   b) Describe the construction and working of Ruby Laser with relevant diagrams. [7M]

(OR)

4. a) Explain the principle of Optical fiber. Describe different types of fibers by giving the refractive index profiles and propagation details. [10M]
   b) The numerical aperture of an optical fiber is 0.39. if the difference in refractive index of the material of its core and cladding is 0.05, calculate the refractive index of material of the core. [4M]

UNIT-III

5. a) Explain the various polarization mechanisms in dielectric materials. [6M]
   b) Deduce the expression for Lorentz field relating to a dielectric material. [8M]

(OR)

6. a) Explain the origin of magnetism in materials. [4M]
   b) Draw and explain B-H curve for a ferromagnetic material placed in a magnetic field. Distinguish between soft and hard magnetic materials. [10M]

UNIT-IV

7. a) State the acoustic requirements of a good auditorium. Explain how these requirements can be achieved. [8M]
   b) Explain how the absorption coefficient of an acoustic material is determined. [6M]

(OR)

8. a) What are the ultrasonic waves? Discuss their properties. [5M]
   b) What is the principle of pulse echo testing? Discuss the procedure of this inspection method. [9M]

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UNIT-V

9. a) What are Miller indices? Draw (001), (120) and $(\bar{2}11)$ planes in a cubic lattice. [7M]

   b) Deduce the expression for the interplanar distance in terms of Miller indices for a cubic system. [7M]

(OR)

10 a) State and explain Bragg's law. Describe the Powder method of determination of crystal structure with suitable diagrams. [10M]

   b) A beam of x-rays is incident on an ionic crystal with lattice spacing 0.313 nm. Calculate the wavelength of X-rays if the first order Bragg's reflection takes place at a glancing angle of $7^{o}48'$. [4M]

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