

**I B. Tech II Semester Supplementary Examinations, March-2022****ENGINEERING PHYSICS**

(Com. to CE, ME, CHEM, AE, Bio-Tech, AME, Min E, PE, PCE, Metal E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is Compulsory3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) What are the coherent sources? (2M)
- b) Define resolving power of an optical instrument. (2M)
- c) How optical resonance can be achieved in He-Ne laser? (2M)
- d) Define optical rotation. (2M)
- e) A conference room has total volume of  $2000 \text{ m}^3$ . The magnitude of total absorption within the conference room is 100 sabine. Calculate the reverberation time. (2M)
- f) What is packing fraction? (2M)
- g) Explain zener break down in dielectrics. (2M)

**PART -B**

2. a) Explain how Newton's rings are formed? Derive an expression for the radius of curvature of a plano convex lens. (10M)
- b) When Newton's rings are observed in reflected light of wavelength  $5900 \text{ \AA}$ , then the diameter of the 10 th dark ring is found to be 0.5 cm. Calculate i) the radius of curvature of the lens and ii) the thickness of the air film. (4M)
3. a) Describe qualitatively in detail Fraunhofer diffraction at a double slit. (10M)
- b) What is a diffraction grating and explain its importance. (4M)
4. a) Describe the working of quarter wave plates and half wave plates. (10M)
- b) The refractive index of calcite for ordinary ray is 1.658 and for extra ordinary ray is 1.486. The slice having the thickness  $0.9 \times 10^{-4} \text{ cm}$  is cut from the crystal. For what wavelength this slice acts as half wave plate? (4M)
5. a) Obtain the relations between the edge of the unit cell and atomic radius for the BCC and FCC lattices. (10M)
- b) Write short notes on Fast breeder Reactors. (4M)
6. a) Enumerate the features that an auditorium should have for good acoustics. (10M)
- b) Discuss any two applications of Ultrasonics in detail. (4M)
7. a) Explain hysteresis property exhibited by the Ferromagnetic and Ferroelectric materials with a graph. (10M)
- b) What is dielectric loss? Obtain an expression for tangent loss. (4M)