

I B. TECH I SEMESTER REGULAR EXAMINATIONS, AUGUST - 2021
ENGINEERING PHYSICS
(Common to CE and ME)

Time: 3 Hours

Max. Marks: 70

Note: Answer **ONE** question from each unit ($5 \times 14 = 70$ Marks)

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UNIT-I

1. a) Prove that the diameter of the  $n^{\text{th}}$  dark ring in a Newton's ring setup is directly proportional to the square root of the ring number [10M]  
b) Newton's rings are observed in the reflected light of wavelength  $5900 \text{ \AA}$ . The diameter of  $10^{\text{th}}$  dark ring is 0.5 cm. Find the radius of curvature of lens used. [4M]

(OR)

2. a) Obtain the condition for secondary minima in Fraunhofer diffraction due to single slit. [10M]  
b) Calculate the possible order of spectra with a plane transmission grating having 18000 lines per inch when a light of wavelength  $4500 \text{ \AA}$  is used [4M]

UNIT-II

3. a) Derive the relation between the probabilities of spontaneous emission and stimulated emission in terms of Einstein coefficient? [10M]  
b) Calculate the wave length of emitted radiation from GaAs which has a band gap of 1.44 eV? [4M]

(OR)

4. a) Explain the basic principle of holography. [4M]  
b) Discuss the construction and reconstruction of hologram. [10M]

UNIT-III

5. a) Show that  $\mu_r = 1 + \chi$ . [4M]  
b) Explain hysteresis loop observed in ferromagnetic materials. [10M]

(OR)

6. a) Describe the phenomenon of ionic and orientation polarizations. [10M]  
b) Explain the frequency dependence of Polarizability. [4M]

UNIT-IV

7. a) Derive Sabine's formula for reverberation time? [10M]  
b) What are the factors effecting acousting of building? [4M]

(OR)

8. a) Describe with a neat circuit diagram to produce ultrasonic waves by Magnetostriction Method? [10M]  
b) Describe different methods of detecting ultrasonic waves? [4M]

UNIT-V

9. a) Define the three electric moduli derive the relation between them? [10M]  
b) Discuss the types of bending? [4M]

(OR)

10. a) Define stress-strain curve? [4M]  
b) Drive an expression of depression in a cantilever. [10M]

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