

(4)

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OR

- (b) Explain Retardation Plates. The values of μ_E and μ_O for quartz are 1.556 and 1.542 respectively. Calculate the phase retardation for 5890 Å where the plate thickness is 0.035 mm. (CO2)

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B. TECH. (FIRST SEMESTER)

MID SEMESTER

EXAMINATION, Oct., 2023

ENGINEERING PHYSICS

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) What do you understand by coherent sources ? State the basic conditions for observing the phenomena of interference of light. (CO1)

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- (b) The distance between the slit and the biprism and between the biprism and the screen are 60 cm each. The obtuse angle of biprism is 179° and its refractive index is 1.5. If the width of the fringes is 0.1 mm, calculate the wavelength of light. (CO1)
2. (a) Describe and explain the formation of Newton's rings. Obtain the expression for the determination of the wavelength of sodium light. Explain why Newton rings are circular. (CO1)

OR

- (b) In Newton's ring experiment, the diameter of 5th and 10th dark rings are 0.4 cm and 0.8 cm respt. Find the diameter of the 20th dark ring. (CO1)
3. (a) Discuss the theory of Fraunhofer diffraction at single slit and explain the resulting intensity distribution curve. (CO1)

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- (b) A diffraction grating produces an angular separation of 0.01 radian between two wavelengths observed at an angle of 30° . If the mean value of the wavelength is 5000 \AA and the spectrum is observed in the second order, calculate the difference in the two wavelengths. (CO1)
4. (a) What is grating? Derive an expression for the resolving power of grating. (CO2)

OR

- (b) Calculate the least width of a plane diffraction grating having 490 lines per cm to resolve the two sodium lines D1 and D2 (5890 \AA and 5896 \AA) in the second order. (CO2)
5. (a) What do you understand by double refraction? What are the ordinary and extraordinary rays in a uniaxial crystal? (CO2)

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