



Term Evaluation (Odd) Semester Examination September 2025

Roll no.....

Name of the Course and semester: B.Tech, 1st Sem

Name of the Paper: Engineering Physics

Paper Code: TPH-101

Time: 1.5 hours

Maximum Marks: 50

Note: -

- (i) Answer all the questions by choosing any one of the sub-questions.
- (ii) Each question carries 10 marks.

Q1. (10 Marks) CO/Cos

- a) Discuss how coherent sources are produced with the help of Fresnel's biprism. 1
Explain with necessary theory how the wavelength of monochromatic light can be determined using biprism experiment.

OR

- b) The ratio of intensities of two waves that produce interference pattern is 16:1. Deduce the ratio of maximum to minimum intensities in fringe system.

Q2. (10 Marks) CO/Cos

- a) With the help of neat diagram show an experimental arrangement to produce Newton's ring interference pattern. Prove that the diameter of the dark rings is proportional to the square root of the natural number. 1

OR

- b) In Newton's ring arrangement a source is emitting two wavelengths $\lambda_1 = 6.0 \times 10^{-7}$ meter and $\lambda_2 = 5.9 \times 10^{-7}$ meter. It is found that the n th dark ring due to one wavelength coincides with $(n+1)$ th dark ring due to the other. Find the diameter of the n th dark ring if the radius of curvature of the lens is 0.9 m.

Q.3 (10 Marks) CO/Cos

- a) Discuss the phenomenon of Fraunhofer diffraction at single slit and show that the relative intensities of the successive maximum are nearly $1 : \frac{4}{9}\pi^2 : \frac{4}{25}\pi^2 : \frac{4}{49}\pi^2$. 1

OR

- b) Calculate the angle at which the first dark band and the next bright band are formed in the Fraunhofer diffraction pattern of a slit of width 0.3 mm with monochromatic light of wavelength 6000\AA

Q.4 (10 Marks) 2

- a) Explain the process of double refraction? How is this phenomenon used to produce a plane polarized light? Explain in detail.

OR

- b) Polarizer and analyzer are arranged in such a way that the amount of light transmitted through them is maximum. What will be the percentage reduction in the intensity of the incident light when the analyzer is rotated through 30° and 60° .

Q.5 (10 Marks) CO/Cos

- a) Explain the production of plane, circular and elliptically polarized light mathematically. 2

OR

- b) Calculate the thickness of a calcite plate which would convert plane-polarized light into circularly polarized light. The principal refractive indices are $\mu_o = 1.658$ and $\mu_e = 1.486$ at wavelength 5890\AA of light used.