OR

(b) A glass clad fibre is made with core glass of refractive index 1.5 and the cladding is doped to give an index difference of 0.0005.

Determine : (CO2)

(i) the cladding refractive index,

(ii) the critical reflection angle,

(iii) the critical acceptance angle

(iv) acceptance cone and

(v) the numerical aperture.

150

H Roll No. .....

TPH–101

B. TECH. (FIRST SEMESTER)

MID SEMESTER

EXAMINATION, Jan., 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 are the coherent sources ? Explain Fresnel Biprism experiment with diagram. Derive the expression for fringe width, wavelength of monochromatic light and distance between two slits. (CO1)

P. T. O.

OR

(b) Newton's rings are observed in reflected light of wavelength 590 nm. The diameter of the 10th dark rings is 0.005 m. Find the radius of curvature of the lens and the thickness of the air film. (CO1)

2. (a) Discuss the formation of Newton's rings by reflected light. Describe the experimental arrangement. Why are Newton's rings circular ? (CO1)

OR

(b) A parallel beam of light of wavelength 5460 Å is incident at an angle of 30° on a plane transmission grating which has 6000 lines/cm. find the highest order spectrum that can be observed. (CO1)

3. (a) What is plane diffraction grating ? Describe how would you use it to determine the wavelength of light ? (CO1)

OR

(b) Two Nicols are so arranged that the amount of light transmitted through them is maximum. What will be the percentage reduction in intensity of the incident light when analyzer is rotated through 30°. (CO2)

4. (a) Explain the operation of a He-Ne laser with essential components. (CO2)

OR

(b) What do you understand by quarter waveplate ? For calcite $\mu_e = 1.486$ and $\mu_o = 1.658$ for sodium light. Calculate the minimum thickness of the half wave quarter wave and full wave plate for calcite. (CO2)

5. (a) Define specific rotation. Describe the working of a half shade Polarimeter. How will you use it to find the specific rotation of sugar. (CO2)