

Assignment - I Unit

- Q 1.) State and explain Newton Rings. Derive the expression for wavelength.
- Q 2.) Two narrow parallel slits  $0.5 \times 10^{-3}$  m, illuminated by monochromatic light of wavelength  $5890 \text{ \AA}$ . Calculate fringe width if screen is  $0.5 \text{ m}$  from slits.
- Q 3.) In a Newton's ring experiment the diameter of  $5^{\text{th}}$  and  $25^{\text{th}}$  rings are  $0.3 \text{ cm}$  and  $0.8 \text{ cm}$  respectively. Find wavelength of light,  $R = 100 \text{ cm}$ .
- Q 4.) State and derive N-slits Diffraction grating.

Assignment No- 2 Unit

- Q 1.) State and derive Quarter Wave plate and Half Wave plate, and find the expressions of Wavelength.
- Q 2.) Compute the minimum thickness of a Quarter-Wave plate of Calcite for  $\lambda = 5460 \text{ \AA}$ . The Principal refractive Index for Calcite are  $1.652$  and  $1.488$ .
- Q 3.) Calculate the thickness of a doubly refracting crystal for a path difference of  $\lambda/2$  between the O and E-rays, where  $\lambda = 6000 \text{ \AA}$ ,  $\mu_o = 1.55$  and  $\mu_e = 1.54$
- Q 4.) Discuss Polarimeters. Explain Laurentz Half-shade Polarimeter.

Assignments: Unit-III

- Q 1.) Define Population - Inversion, what is Lasing action. state and Derive He-Ne Laser.
- Q 2.) A Laser beam has a band width of  $2800 \text{ Hz}$ . Obtain the coherence length.
- Q 3.) Differentiate between three level and four level lasers.
- Q 4.) State and explain stimulated emission and stimulated emission.

Assignment: Unit - IV

- Q 1.) What are Lorentz Transformations. Explain and Derive.
- Q 2.) Find the Mass and speed of  $3 \text{ MeV}$  electron, where,  $m_0 = 9.1 \times 10^{-31} \text{ kg}$ .
- Q 3.) Explain Principle, construction and Working of Ionization chamber, Proportional Counter.
- Q 4.) State and Prove Mass- Energy equivalence.