

Unique Paper Code : 32225310

Name of the Paper : Waves and Optics

Name of Course : B.Sc. Hons.-CBCS_GE_OC

Semester : III - Semester

Duration : 3 Hours

Maximum Marks : 75

Attempt any four questions in all. All questions carry equal marks.

- 1) (a) Giving necessary theory, explain the formation of standing waves on a stretched string. (10.75)
(b) A string of length L is fixed at its two ends. Discuss and obtain different harmonics. (4)
(c) Distinguish between the progressive and stationary waves. (4)
- 2) (a) Giving necessary theory explain how fresnel biprism experiment is used for determination of wavelength of a monochromatic source of light? (10.75)
(b) Explain how Fresnel's biprism experiment can be used for determination of thickness of a thin transparent film? (8)
- 3) (a) Describe how the Newton's rings experiment can be used for determination of refractive index of a liquid? (12.75)
(b) Distinguish between the fringes of equal inclination and fringes of equal thickness. (6)
- 4) (a) Derive an expression for intensity distribution due to diffraction of N number of parallel identical slits. How many minima and secondary maxima do we have between any two principal maxima? (14.75)
(b) A plane transmission grating having 5000 lines per cm is being used under normal incidence of light. What is the maximum wavelength of light whose spectrum can be seen in 4th order? (4)

- 5) (a) What do you mean by half period zones. Give their significance. (4)
- (b) Give the theory and construction of zone plate. How can it be compared with a convex lens? (10.75)
- (c) The diameter of the first ring of a zone plate is 1.1 mm. If a plane wave of wavelength 6000 \AA falls on the plate, where should the screen be placed so that the light is focused to a brightest spot. (4)
- 6) (a) Explain what is polarization? How would you distinguish between:
- (i) Circularly polarised and Unpolarised light.
- (ii) Elliptically polarised and partially polarised light. (12.75)
- (b) What is reverberation? On what factors does it depend? (6)