

Time 3Hrs

Max Marks 75

SECTION A

5 X 10-50M

Answer ALL Questions of the following

1. Describe the Principle and Working of Fresnel's biprism. Also determine the thickness of a thin glass plate using biprism experiment?

OR

Outline the theory of fringe shape in Michelson's Interferometer and discuss the nature of interference pattern produced

2. Describe Fraunhofer diffraction due to a single slit and deduce the positions of maxima and minima. Draw the representative graph of the intensity distribution

OR

Distinguish between Fresnel's and Fraunhofer's diffractions. How is a plane transmission grating used to determine the wavelength of a light

3. Describe the construction and working of Nicol prism. Explain how it can be used as polarizer and analyzer

OR

Explain in detail how plane, circular and elliptically polarized lights are produced and detected?

4. Explain spherical aberration with a neat diagram. Describe any three methods to eliminate spherical aberration

OR

Discuss the modes step and graded index fibers and their structures

5. Write construction and working of He-Ne Laser. Write the applications of laser

OR

What is the basic principle of holography? Explain the working of Gabor hologram. What are its limitations

SECTION-B

5x5=25Marks

Answer any FIVE questions

6. Write a note on Astigmatism.

7. Two thin lenses 16 cm and 12 cm form a combination which is corrected for spherical aberration. Find the distance between the principal points of the combination

8. Write a note on colors of thin films

9. 40 fringes are displaced when a thin glass plate is introduced in one of the paths of the interfering beams. Find the thickness if its refractive index is 1.5 (wavelength of light used is 4000 Å)

10. Distinguish between zone plate and convex lens.

11. What is Fresnel's half period zones? Explain

12. Write a short note on Babinet compensator

13. Determine the thickness of a quarter wave plate of calcite which can produce circular polarized light for calcite $n_o = 1.486$ and $n_e = 1.658$, and $\lambda = 5893 \text{ Å}$

14. Write the advantages of optical fiber communication.

15. Write down applications of Lasers