Unit III

6. Discuss the phenomenon of diffraction at a straight edge and find the positions of Maxima and Minima. **8**

7. (a) What is a Zone plate ? How is it formed ? Show that a zone plate has multiple focil. **6**

   (b) Find the radii of first three clear half period zones of a Zone plate designed to bring a parallel beam of light of wavelength 6000 A to its focus at a distance of 2 m. **2**

Unit IV

8. Describe analytically the Fraunhoffer diffraction at a double slit. Find the conditions for the missing orders in the spectrum. **8**

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B. Sc. EXAMINATION, 2025

(Thrid Semester)

PHYSICS

Paper–VI

Wave and Optics-I

Time : 3 *Hours*] [*Maximum Marks :* 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) What are the conditions to obtain good and sustained Interference fringes ? **2**

(b) What will happen when Plane mirror is used instead of Planoconvex lens in Newton's rings ? **2**

(c) What are the differences between a Zone plate and Lens ? **2**

(d) What is disperstive power of a Grating ? On what factors does it depend ? **2**

Unit I

2. (a) Describe Fresnel's biprism experiment to determine the thickness of thin sheet of a Transparent material. **5**

(b) A biprism of angle 1 and refractive index 1.5 is placed at a distance Find the fringe width on a screen placed at distance of 60 cm from the biprism when wavelength of Light used is 5893 A. Distance of 40 cm from the slit. **3**

3. (a) Describe the Lloyd's mirror experiment to obtain the interference Fringes. Give the conditions of bright and dark fringes in this method. **4**

(b) Describe Stoke's law of reflection. **4**

Unit II

4. (a) Describe the interference by Wedge shaped film and find the expression of Fringe width. **6**

(b) When the moveable mirror of Michelson's interferometer is displaced by 0.0589 mm, 200 fringes are observed to cross the field of view. Find the Wavelength of the Monochromatic light used. **2**

5. What are Newton's rings ? Explain the formation of Newton's rings. Find the wavelength of Sodium light by Newton's rings. **8**

9. (a) What is Resolving power ? Discuss Rayleigh's criterion of resolution. **3**

(b) Explain, how a plane transmission grating can be used to determine the wavelength of Monochromatic light. **2**

(c) Find the missing orders in the diffraction pattern of a double slit if the slit width is 0.16 mm and opaque width is 0.8 mm. **3**

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