Unit III

6. Discuss various assumptions taken by Fresnel to explain diffraction. What is construction and working of zone plate ? Find out expression for its focal length of zone plate and explain why it is multifocii. **8**

7. Discuss Fresnel diffraction from rectangular and circular aperture. Compare its fringes and discuss effect of width/diameter on fringe width. **8**

Unit IV

8. (a) Discuss double-slit diffraction if source and observation points are at infinity and observed at foeal plane of lens. **4**

(b) What are spectrum from a plane transmission grating and its application in spectroscopy ? Find out relation for dispersive power of grating. **4**

Subject Code—52530

B. Sc. EXAMINATION

(Reappear) (Batch 2017)

(Third Semester)

PHYSICS

PH-302

Paper VI

Wave and Optics-I

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

Note : Attempt Q. No. **1** and *four* more questions selecting *one* question from each Unit. All questions carries equal marks.

1. (a) Give two examples for interference by division of wavefront and division of amplitude. **1½**

(b) Give relation between path difference and phase difference. **1**

(c) What will be path difference between two rays from a parallel thin film for destructive interference ? **1½**

(d) If LASER is used in Michelson Interferometer, what happens compared to sodium source ? **1½**

(e) What do you mean by half period zones ? **1**

(f) What will be resolving power of 10000 l/mm grating in first and second order if only half grating is illuminated ? **1½**

Unit I

2. (a) What do you mean by coherence of light ? Discuss difference between termporal and spatial coherence. **4**

(b) Draw neat diagram showing creation of two virtual sources from a Fresnel's biprism. How separation between these source is measured using a lens ? **4**

3. Discuss formation of interference fringes with a Lloyd's mirror setup. Give analytical expression for fringe width variation with wavelength. What are differences between Bi-prism and Lloyd's Mirror fringes ? **8**

Unit II

4. (a) Discuss interference due to transmitted and reflected light in plane parallel thin films. **5**

(b) In a wedge shaped film having wedge angle of 1°, what will be separation between fringes if looked with sodium source (λ = 589.6 nm). **3**

5. (a) Discuss Newton's ring set up used in Laboratory to measure wavelength of sodium light. **4**

(b) If radius of plano-convex lens used in Newton's ring set up is 1000 mm, what will be diameter of 20th ring if sodium light source is used ? **4**

9. (a) How does diffraction limit resolving power of any instrument ? Discuss taking example of a telescope. **5**

(b) To resolve two sources with wavelength difference of 10 Å what should be minimum number of grating lines to resolve both lines at 500 nm and first order itself. **3**

9. (a) How does diffraction limit resolving power of any instrument ? Discuss taking example of a telescope. **5**

(b) To resolve two sources with wavelength difference of 10 Å what should be minimum number of grating lines to resolve both lines at 500 nm and first order itself. **3**