



**III ANSWER BRIEFLY:****( 5 x 2 = 10)**

16. State Huygen's principle of wave propagation and mention its limitations.
17. Differentiate between coma and astigmatism.
18. How are coherent sources formed in biprism?
19. Differentiate between Fresnel diffraction and Fraunhofer diffraction.
20. Brief double refraction in uniaxial crystal.

**SECTION – B****ANSWER ANY FIVE QUESTIONS:****( 5 x 6 = 30)**

21. A convex lens of refractive index 1.5 and 3 cm thick has radii of curvature 6 cm and 8 cm. Find the focal length of the lens.
22. The focal length of an achromatic combination of two lenses in contact is 100 cm. If the dispersive powers of the materials of the two lenses are 0.02 and 0.025, calculate the focal lengths of two lenses.
23. Newton's rings are observed in reflected light of wavelength  $6000 \text{ \AA}$ . The diameter of the 10<sup>th</sup> dark ring is 5mm. Find the radius of curvature of the lens and the thickness of the film
24. What is meant by resolving power? Brief Rayleigh's criterion.
25. A parallel beam of light of wavelength  $5893 \text{ \AA}$  is incident at an angle of  $30^\circ$  on a plane diffraction grating which has  $5.5 \times 10^5$  lines/m. Find the highest order of the spectrum that can be observed.
26. What is quarter wave plate? How it is used to produce circularly polarized light.
27. Calculate the thickness of a half wave plate for a light of wavelength  $5000 \text{ \AA}$ . Given  $\mu_e = 1.553$ ,  $\mu_o = 1.544$

**SECTION – C****ANSWER ANY THREE QUESTIONS:****( 3 x 15 = 45 )**

28. With suitable figures, state and explain Fermat's principle. Hence deduce the laws of reflection and refraction of light.
29. Explain construction, working and the theory of Huygens eye pieces. Also mention its merits and demerits.
30. Describe the principle, construction and working of Michelson's interferometer. Mention its application.
31. Describe and explain phenomenon of diffraction due to a straight edge.
32. Define specific rotation. Describe construction and working of Laurents half shade polarimeter and the used method to determine specific rotation of a solution.

