

SCIM GOVERNMENT COLLEGE TANUKU W.G.Dt
DEPARTMENT OF PHYSICS
QUESTION BANK
PHYSICS PAPER –II
(WAVE OPTICS)

UNIT-I INTERFERENCE

1. Explain the construction and working of Lloyd's Single Mirror? (10M)
2. Discuss the formation of Newton's rings. How to determine the diameter of wire using Newton's rings? (10M)
3. Explain the construction and working of Michelson interferometer? (10M)
4. Explain the concept of spatial coherence and temporal coherence? (5M)
5. What are the conditions of interference of light? (5M)
6. Explain the concept of change of phase on reflection? (5M)
7. Explain the concept of colors of thin films? (5M)
8. Discuss the theory of wedge shaped film? (5M)

UNIT-II DIFFRACTION

1. Discuss the theory of diffraction due to single slit? (10M)
2. Discuss the theory of diffraction due to N- slit? (10M)
3. What are Fresnel half period zones and obtained the equation for the area of half period zones? (10M)
4. What is zone plate and explain the construction of zone plate? (10M)
5. Derive the equation for resolving power of grating? (5M)
6. What are the differences between Fresnel and Fraunhofer diffraction? (5M)
7. What are the differences between interference and diffraction? (5M)
8. What are the differences between zone plate and convex lens? (5M)

UNIT-III POLARIZATION

1. What is the principle of Nicol's prism? Explain the construction and working of Nicol's prism? (10M)
2. What is specific rotation? How to determine specific rotation by Laurent's half shade Polari meter? (10M)
3. State and explain Malus law? (5M)
4. State and explain Brewster's law? (5M)

5. Define double refraction and explain? (5M)
6. Explain the working of quarter wave plate? (5M)
7. Explain the working of half wave plate? (5M)
8. How to produce and detect circularly, elliptically polarized light? (5M)

UNIT-IV ABERRATIONS AND FIBRE OPTICS

1. What is achromatic? Discuss how to minimize chromatic aberration when two lenses are in contact and separated by a distance? (10M)
2. What are the methods to minimize spherical aberration-Explain? (10M)
3. Explain different types of optical fibers? (10M)
4. Explain the concepts of coma? (5M)
5. What is coma and derive Abbe Sine condition? (5M)
6. Explain the concept of Astigmatism? (5M)
7. What is Chromatic aberration and how to determine it? (5M)
8. State and explain spherical aberration? (5M)
9. Define and explain curvature and distortion? (5M)
10. Explain the principle of fiber communication? (5M)
11. What are the advantages of fiber communication? (5M)

UNIT-V LASERS AND HOLOGRAPHY

1. Describe the construction and working of Ruby laser? (10M)
2. Describe the construction and working of He-Ne laser? (10M)
3. Derive the expression for Einstein coefficients? (5M)
4. What is population inversion-explain? (5M)
5. Explain the principle of laser? (5M)
6. Define and explain excitation, spontaneous emission and stimulated emission? (5M)
7. What are the applications of lasers? (5M)
8. Explain the basic principle of Gabor hologram? (5M)
9. What are the applications of holography? (5M)