

# ANURAG GROUP OF INSTITUTIONS

(Autonomous)

School of Engineering

I-B.Tech-I-Semester

Assignment Questions

Subject: APPLIED PHYSICS-I

1. a) Define interference of light? Explain Young's double slit experiment.  
b) Explain coherence and discuss different methods to produce coherent sources.
2. a) Discuss the phenomenon of interference of light reflected by a thin film and obtain expressions for maximum and minimum intensity.  
b) Find the thickness of a soap film ( $\mu=1.21$ ) which gives constructive second order interference of reflected orange light of wavelength  $5000\text{\AA}$  under normal incidence.
3. a) Explain the formation of Newton's rings and derive the expression for wavelength of incident light.  
b) In a Newton's ring experiment, the diameter of 8<sup>th</sup> ring was 0.35cm and 18<sup>th</sup> ring was 0.65cm. If wavelength of light is  $6000\text{\AA}$ . Find the radius of curvature of Plano convex lens.
4. a) Discuss the Fraunhofer diffraction at a single slit and obtain the conditions for minima and maxima of the diffraction pattern  
b) Find the polarizing angle of crown glass plate of refractive index 1.531.
5. a) Explain the construction of Grating. Discuss resolving power of a Grating.  
b). Explain polarization by reflection.
6. What are different types of attenuation losses in optical fibers and discuss in detail.
7. a) Define acceptance angle and numerical aperture of an optical fiber and obtain expression for them.  
b) The numerical aperture of an optical fiber is 0.39, if the difference in the refractive indices of the material of its core and the cladding is 0.05, calculate the refractive index of material of the core?
8. a) Distinguish between multi mode step index optical fiber and multi mode graded index optical fiber.  
b) An optical fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59. Find the acceptance angle for the fiber in water of refractive index 1.24.