Roll No.

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATIONS-2022
B.Tech-I Semester (BI/BT)

COURSE CODE (CREDITS): 18B11PH112 (4) MAX. MARKS: 25
COURSE NAME: Basic Engineering Physics-I
COURSE INSTRUCTORS: Dr. Ragini Raj Singh MAX. TIME: 1 Hour 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in square brackets. Calculators are allowed.

Q.1. How to determine the wedge angle; derive the formula and explain with the help of proper diagram? Why the fringe at apex is dark in the wedge shaped film? *[CO: 1, 2; Marks: 3]*

Q.2. How to determine the wavelength of light and refractive index of liquid using Newton's ring experimental setup, derive the required equations and explain how to perform the experiment? *[CO: 2, 5; Marks: 3]*

Q.3. What is the difference between single slit and double slit diffraction? Find out the equations for missing orders in case of double diffraction grating for a=b, 2a=b and b=0, *[CO: 2; Marks: 3]*

Q.4. For N-slit diffraction grating what is the dispersive and resolving powers. Discuss and write the equations with proper explanation. *[CO: 2; Marks: 3]*

Q.5. Define the following: *[CO: 1, 2; Marks: 2]*
a. Plane of vibration and Polarization
b. Double refraction

Q.6. In Newton's ring experiment what will be the order of the dark ring which will have double the diameter of that of 15th dark ring. The wavelength of the light used is 500 nm. *[CO: 5; Marks: 1.5]*

Q.7. A Newton's ring experiment performed with the source of light having two wavelengths λ_1 = 600 nm and λ_2 = 500 nm. It is found that the nth dark ring due to λ_1 coincides with (n+1)th dark ring due to λ_2. If the radius of curvature of the plano convex lens is 100 cm, find the diameter of the nth dark ring for λ_1. *[CO:2, 5; Marks: 2.5]*

Q.8. Light of wavelength 500 nm falls normally on a thin wedge shaped film of refractive index 1.6 forming fringes that are 3 mm apart. Find the angle of the wedge. *[CO: 5; Marks: 2]*

Q.9. Light of wavelength 600 nm falls normally on a plane transmission grating having 20,000 lines in 4 cm, find the angle of diffraction for maximum intensity in 2nd order. *[CO: 2, 5; Marks: 2.5]*

Q.10. A grating has 8000 lines per cm drawn on it. If its width is 8 cm. Compute the following:
(i) The resolving power in 2nd order.
(ii) The smallest wavelength that can be resolved in the third order in 600 nm region.
[CO: 5; Marks: 2.5]