JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- 2025
B.Tech-I Semester (BT/BI)

COURSE CODE (CREDITS): 25B11PH112　　　　　　　　　　　MAX. MARKS: 25

COURSE NAME: Basic Engineering Physics

COURSE INSTRUCTORS:　　　　　　　　　　　　　　　MAX. TIME: 1 Hour 30 Min

Note: (a) *All questions are compulsory.*
　　　　(b) *The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*
　　　　(c) *Use of calculator is allowed.*

Q.No	Question	CO	Marks
Q1	(a) Explain: (i) Basic Criteria for diffraction. (ii) Classification of diffraction. (iii) Conclusions of diffraction from single slit, circular aperture and double slit diffraction.	2	2.5
	(b) What are the conditions for absent spectra in transmission diffraction grating? Also, discuss about highest possible order of principal maxima in the same.		2.5
Q2	(a) Derive the equations for dispersive power and resolving power of diffraction grating.	2	3
	(b) Derive the general equation of ellipse for superposition of two linearly polarized waves mutually perpendicular to each other. Also give results in the conditions when $\delta=0$, $\delta=\pi$ and $\delta=2\pi$. Discuss when we will get circular and elliptically polarized light		5
Q3	Discuss polarimeter equipment within the following heads: (1) Diagram and role of each component (2) How to calculate specific rotation (3) What are the factors that can affect angle of rotation?	3	3
Q4	(a) Light of wavelength 6000 Å is incident on a slit of width 0.3 mm. The screen is placed 1.2 m from the slit. Find (i) The position of the first dark fringe (ii) Width of the central bright fringe	3	2
	(b) In a single slit diffraction experiment minimum for $\lambda_1 = 450$ nm coincides with first maxima of λ_2. Calculate λ_2.		1.5
Q5	(a) In NRE the diameter of the 5th and 10th ring respectively was 0.40 cm and 0.55 cm. if the wavelength of light is 6000Å. Find the radius of curvature of the lens in contact with the glass plate.	4	1.5
	(b) Newton's ring arrangement is used with a source emitting two wavelengths λ_1 =6500 A° and λ_2=5000 A° and it is found that the nth dark ring due to λ_1 coincides with (n+1)th dark ring for λ_2. Find the diameter of nth dark ring of λ_1 if the radius of curvature of the lens R=100 cm.		2
	(c) In a Newton's rings experiment the diameter of the 10th ring changes from 1.40 cm to 1.20 cm when a liquid is introduced between the lens and the plate. Calculate the refractive index of the liquid.		2