

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-I Semester (BI/BT)

COURSE CODE (CREDITS): 25B11PH112 (04)

MAX. MARKS: 15

COURSE NAME: Basic Engineering Physics

COURSE INSTRUCTOR: Ragini Raj Singh

MAX. TIME: 1 Hour

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) The displacement of a wave is given by $y = 0.2 \sin(8x - 16t)$ where x is in meters and t is in seconds. Find the wave speed, frequency and wavelength.	1	1.5
	(b) What are the necessary conditions to get the sustained interference pattern.		1.5
Q2	(a) Derive the interference term $2.E_1E_2 \cos \delta$ or $2.\sqrt{I_1I_2} \cos \delta$.	1	2
	(b) In a YDSE with $d=0.50$ mm and $D=1$ m, two thin transparent sheets are placed in front of the two slits. Sheet 1 has thickness $t_1=3$ μ m and $\mu_1=1.55$. Sheet 2 has thickness $t_2=2.5$ μ m and $\mu_2=1.45$. Find the magnitude and direction of the shift of the central maximum.		2
Q3	(a) Derive $t = \frac{xD}{D(\mu-1)}$ for lateral displacement of fringes.	1	2
	(b) A quasi-monochromatic light source has a central wavelength $\lambda=550$ nm and a spectral line width $\Delta\lambda=0.50$ nm. Determine the coherence length L_c of the light and the maximum order $N_{\max}$ of interference fringes observable in a YDSE using this source.		2
Q4	(a) How to find refractive index of unknown liquid using Newtons Ring experiment?	2	2
	(b) Two wavelengths $\lambda_1=600$ nm and $\lambda_2=400$ nm are used simultaneously in a YDSE with $d=0.6$ mm and $D=1.2$ m. Find the minimum distance from the central axis where a bright fringe of λ_1 coincides with a dark fringe of λ_2 .		2