

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-I Semester (CSE/IT/BT/ECE/CE)

COURSE CODE (CREDITS): 26PMSX101 (3)

MAX. MARKS: 15

COURSE NAME: Physics for Forensic Science I

COURSE INSTRUCTOR: Haresh Raval

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 not allowed

Q.No	Question	CO	Marks
Q1	In triangle OAB, M is the midpoint of OA and N divides AB in the ratio 1:2. $\vec{OM} = \mathbf{a}$, $\vec{OB} = \mathbf{b}$. Express $\vec{MN}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.	CO 2	2
Q2	A charge of 1 mC and mass 50 g enters a region with constant electric field of 400 V/m along the direction of the field with an initial velocity 5 m/s. The region stretches 51 m along the direction of the field. How long will it take for a charge to cross the region? Calculate the velocity with which it leaves the region?	CO 3	3
Q3	a. Define momentum and energy conservation laws, coefficient of restitution. b. Show that for perfect inelastic collision two colliding objects stick together irrespective of their mass after collision. c. When you get down from speeding bus you tend to imbalance or fall down, explain this phenomenon using laws of motion.	CO 2	3
Q4	Trajectory equation (y as a function of x) of projectile is: $y = x \tan \theta - \frac{g}{2v_0^2 \cos^2 \theta} x^2$, where symbols have their usual meanings. a. Derive the expressions for range, total time of flight and maximum height. b. Show that projectile falls back with the same velocity it was shoot with.	CO 4	4
Q5	1. A student pulls on a rope wrapped around the outer rim of a heavy cylindrical pulley. If the pulling force is directed at a (30°) angle relative to the radial line (radius vector from the pivot to the point of application), how does the torque compare to pulling perpendicular (90°) to the radius with the same force magnitude? 2. A uniform seesaw of length L is in static equilibrium at 30° about horizontal axis with a child of mass m sitting at distance d1 from the pivot on the left and lower side, and a heavier adult of mass 2m sitting on the right and upper side at d2. Find d2?	CO 3	3