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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science and Engineering

Mid Term Examination, Fall-2024

Course Code: PHY101 Course Title: Physics I

Level: 1 Term: 1 Batch: 67

Time: 1.5 Hour **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	*a)*	Express the significance of frame of reference?	1	CO1
	b)	Give the definition of linear and angular momentum to present their association.	1	
	c)	Define instantaneous velocity and instantaneous acceleration.	1	
	d)	Review the classification of mechanical wave with example.	1	
	e)	Explain the damped oscillation in simple harmonic motion?	1	
2.	*a)*	Derive the time to reach maximum vertical distance and correlate that it is double to time to reach landing point of a projectile.	3	CO2
	b)	Solve the general solution of simple harmonic oscillation equation and interpret that as $X=A\sin(\omega t + \delta)$ where symbols have their usual meaning.	3	
	c)	Describe the moment of inertia and radius of gyration of a solid cylinder rotating about its own axis.	4	
3.	*a)*	A ball is kicked at an angle of 45^0 with the horizontal and with the velocity of 20 m/s. Figure out the horizontal and vertical position of the ball after 1.5 sec of throwing it.	2.5	CO3
	b)	A simple harmonic vibration equation is defined by $Y = 10 \sin(62.832t + \phi)$. The displacement at 0 sec is 5cm. Evaluate (i) the epoch (ii) the frequency and (iii) the maximum velocity.	2.5	
	d)	A 1300 kg car is stick to another car of mass of 900 kg by colliding with it a velocity of 3 cm/sec. Identify the velocity of the cars just after their interaction between them.	2.5	
	e)	A cyclist starts from the rest and accelerates uniformly to a speed of 10 cm/sec over a distance of 400 cm. Determine the acceleration of the cyclist and the total time it takes for the cyclist to reach the final speed.	2.5	

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