



Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science and Engineering
Mid Examination, Summer 2025
Course Code: PHY101, Course Title: Physics I
Level: 1 Term: 2 Batch: 68

Time: 1.5 Hours (90 Min.)

Marks: 25

Answer ALL Questions [Optional]

[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)	Recall the concept of the radius of gyration.	1	CO1
	b)	State Newton's 2 nd law.	1	
	c)	Explain the Work-Energy theorem.	1	
	d)	Write down the mathematical equation for Hooke's Law with significance.	1	
	e)	Define damped vibration.	1	
2.	a)	Compute the moment of inertia of a thin uniform rod is , when the axis passes through the midpoint and is normal to the length of the rod.	3	CO2
	b)	Demonstrate that the path of a projectile follows the parabolic form.	3	
	c)	Interpret the solution of the differential equation of simple harmonic motion.	4	
3.	a)	A car with a mass of 1200 kg was moving at a velocity of 20 ms ⁻¹ . While moving it collided with a car with a mass of 800 kg at rest. After the collision the cars combined and moved 50 m ahead and stopped. What was the magnitude of the resisting force. <i>2.5</i>	2.5	CO3
	b)	An archer launches an arrow with a speed of 25.0 m/s at an angle of 40 degrees above the horizontal. (a) How long is the arrow in the air? <i>3.23</i> (b) How far away does it land? <i>62.60</i> (c) What is the maximum height it reaches? <i>13.16</i>	2.5	
	c)	A simple harmonic vibration equation is defined by $Y = 5 \sin (60.832t + \phi)$. The displacement at 0 sec is 2cm. Find (i) the epoch <i>.4</i> (ii) the frequency <i>2.6</i> and (iii) the maximum velocity. [Use CGS unit.]	2.5	
	d)	A skater of mass 4 kg is initially at rest. A constant force of 12 N acts on the skater for 3 seconds. After that, the force is removed. How far does the skater travel in 7 seconds from the start? <i>47.5</i>	2.5	