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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Mid Term Examination, Summar 2026

Course Code: PHY 101; Course Title: Physics-I

Sections & Teachers: SH(A-D) & RH(E-G)

Time: 1 Hour 30 Mins **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.	**Draw** and **describe** a graph that represents the relationship between force and friction.	[2.5]	CO-*1*,
	b.	**Describe** the different types of acceleration that occur in circular motion.	[2.5]	*C1*
2.	a.	Starting from the equation of motion of a particle in SHM, **estimate** that the total energy is constant and proportional to the square of the amplitude.	[5]	CO-*2*,
	b.	**Approximate** the expressions for different parameters (trajectory; range, maximum height) involved in a projectile motion. **Predict** that for $\theta = 75.96°$, the maximum height of a projectile is equal to its horizontal range.	[5]	*C2*
3.	a.	A spring-mass system: m = 200 g, k = 50 N/m, pulled A = 5 cm from equilibrium, released from rest. **Calculate:**	[5]	
		(i) The equation of motion and the time period.		CO-*3*,
		(ii) The velocity at displacement 3cm.		
		(iii) The total mechanical energy of the system.		*C3*
	b.	A ball is thrown from the top of a building 60 m high with an initial speed of 25 m/s at an angle of 35° above the horizontal. **Calculate:**	[5]	
		(i) The time taken for the ball to reach the ground.		
		(ii) The horizontal range from the base of the building.		
		(iii) Find the position (x, y) and speed of the ball at t=1.5sec.		