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Daffodil International University

Department of Software Engineering
Faculty of Science & Information Technology
Midterm Examination, Fall 2025

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

Sections & Teachers: (A-D), (E-H,M), (I-L) & (SH, MI, RH)

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.	**Define** with physical significant the terms Momentum and Moment of Inertia.	[1.5]	CO-1, C1
	b.	Draw and **describe** a graph that represents the relationship between force and friction.	[2]	
	c.	**Retrieve** how a resonance is different from damping.	[1.5]	
2.	a.	**Compute** the expression for total energy of a particle executing SHM.	[3]	CO-2, C2
	b.	**Estimate** mathematical expression for a standing wave.	[3]	
	c.	**Approximate** the expressions for different parameters (trajectory, range, maximum height) involved in a projectile motion.	[4]	
3.	a.	A SHM is represented by the equation $y=10\sin[10t-(\pi/6)]$. **Calculate (i)** time period **(ii)** maximum displacement **(iii)** maximum velocity and maximum acceleration **(iv)** displacement, velocity and acceleration at time t=1sec.	[4]	CO-3, C3
	b.	A projectile is launched with an initial speed of 20 m/s at an angle of 30 degrees above the horizontal from a height of 40 meters. **Compute: (i)** The time and range it takes for the projectile to hit the ground. **(ii)** velocity of the ball when it reaches the ground	[3]	
	c.	A particle moves in a circle of radius 6m. Its linear speed is given by $v = t^2+2t$. (i) **Compute** the centripetal and tangential acceleration at 3s **(ii) Calculate** the angle between the resultant acceleration and the radius vector.	[3]	