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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Midterm Examination, Spring 2026

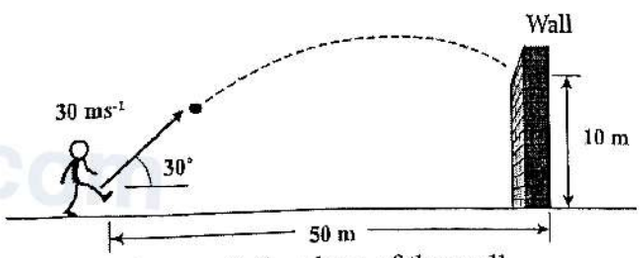
Course Code: PHY 101; Course Title: Physics-I

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

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** centripetal acceleration and tangential acceleration with a figure.	[1.5]	CLO-1, Level- C1
	b.	**Draw** and **describe** a graph that represents the relationship between applied and frictional force.	[2]	
	c.	**Compare** a wave and an oscillation.	[1.5]	
2.	a.	**Construct** the second-order differential equation of SHM of a particle executing circular motion.	[3]	CLO-2, Level-C2
	b.	**Estimate** the mathematical expression for a standing wave.	[3]	
	c.	**Explain** and **express** the projectile-motion parameters: trajectory equation, range, and maximum height and describe what each parameter means in the context of projectile motion.	[4]	
3.	a.	A 4 kg block slides down an inclined surface with an angle of 30° to the horizontal. Starting from rest, it covers 8m in the first two seconds. **(i) Calculate** the coefficient of kinetic friction. **(ii)** If the block is pushed down with an additional force of 4N, **compute** the distance after 2 seconds?	[5]	CLO-3, Level-C3
	b.	 **(i) Compute** the time required to reach the plane of the wall. **(ii) Determine** (using projectile-motion equations) whether the ball will pass the wall. **Show** the calculation of the ball's height at the wall's position and compare it with 10 m.	[5]	

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