



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

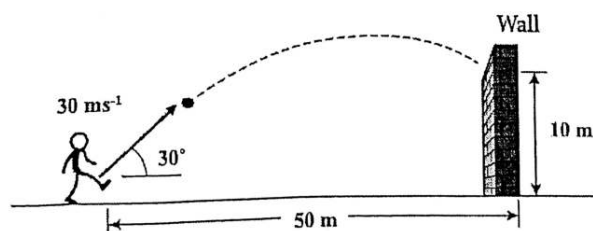
Marks: 25

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. [5] CLO-3, Level-C3
- (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?

- b. [5]



(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.