Set F Time: 40 Minutes	**PHY 101: Mechanics** Class Test 1 | 15 Marks	Spring 2026 Batch 70 (L1T2)

1 **A footballer kicks a ball into the air, and it appears to follow a curved (conical) path.**

a) What will this path be called if the motion is considered projectile motion? (1) (CO1)

b) Prove that the time of ascent is equal to the time of descent for the ball. (4) (CO2)

c) If the initial velocity is 25 ms^{-1} and the angle of projection is 30°, find

i) the maximum height, (2) (CO3) ii) the range of the ball. (2) (CO3)

2 **Two molecules in an isolated jar collide with each other, and an action–reaction force acts between them.**

a) Which law of motion describes this type of interaction? State the law. (1) (CO1)

b) Show mathematically that the linear momentum of the system remains conserved. (3) (CO2)

3 A cyclist starts from the rest and accelerates uniformly to a speed of 10 cm/sec over a distance of 400 cm. Calculate the acceleration of the cyclist and determine the total time it takes for the cyclist to reach the final speed. (2) (CO3)