



Applied Physics (NS-1001)

Quiz # 2A

Fall 2025

Instructor: Dr. Tashfeen Zehra

Name:

Roll #:

Section: BCS-B

CLO4

Date: 17-09-2025

Q.1: The height of a helicopter above the ground is given by $h=3.00t^3$, where 'h' is in meters and 't' is in seconds. After 2.00 s, the helicopter releases a small mailbag. How long after its release does the mailbag reach the ground? (7M)

Solution:

$$y = 3.00t^3: \text{ At } t = 2.00 \text{ s, } y = 3.00(2.00)^3 = 24.0 \text{ m and}$$

$$v_y = \frac{dy}{dt} = 9.00t^2 = 36.0 \text{ m/s } \uparrow.$$

If the helicopter releases a small mailbag at this time, the equation of motion of the mailbag is

$$y_b = y_{bi} + v_i t - \frac{1}{2} g t^2 = 24.0 + 36.0t - \frac{1}{2}(9.80)t^2.$$

Setting $y_b = 0$,

$$0 = 24.0 + 36.0t - 4.90t^2.$$

Solving for t , (only positive values of t count), $t = 7.96 \text{ s}$.