Phys 101 – Sec #37 (Key) **Quiz # 1 (Ch. 1 + 2)**

Name: **ID #**

1- A stone is thrown vertically upward with an initial speed of 15 m/s. What is its speed at a height of 10 m from its release point?

(4)

$v_0 = +15 \frac{m}{s}$

$\Delta Y = +10\ m$

$a = -g$

$v = ?$

use the equation $v^2 - v_0^2 = 2a\Delta Y$

$v^2 = (15)^2 - 2(9.8)(10) =$

$v = \pm\sqrt{29} = \pm 5.4 \frac{m}{s}$

speed $\simeq 5.4 \frac{m}{s}$.

2- A particle moving along the x axis has a position given by

$x = (24\,t - 2\,t^3)$ meters,

Where t is measured in seconds. Find the position of the particle when it stops momentarily ~~لحظياً~~ (its speed is zero)?

(3)

$v = \frac{dx}{dt} = 24 - 6t^2$

$v = 0 \Rightarrow 24 - 6t^2 = 0$

$6t^2 = 24$

$t^2 = 4$

$\boxed{t = 2\ s}$

$X = 24(t) - 2(t)^3$

$= 24(2) - 2(2)^3 = 48 - 16 = 32\ m$

3- The position x of a particle is given by $x = Bt^2 + \frac{C}{B}t$, where x is in meters and t is in seconds. What is the dimension of C?

$[L] = B[T]^2 + \frac{C}{B}[T]$ each term should have dimension of [L]

(3)

– $B[T]^2 = [L] \Rightarrow B = \frac{[L]}{[T]^2}$

– $\frac{C}{B}[T] = [L] \Rightarrow C = \frac{[L]}{[T]} \cdot B = \frac{[L]}{[T]} \cdot \frac{[L]}{[T]^2} = \frac{[L]^2}{[T]^3}$

dimension of $C = \frac{[L]^2}{[T]^3}$