

# ENG 234 ASSIGNMENT

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18/MHC01/272

BIOMEDICAL ENGINEERING

1  $v = (4t - 3t^2) \text{ m/s}$

$s = ?$

$t = 4 \text{ s}$

$s = 0$  when  $t = 0$

$v = \frac{\delta s}{\delta t} = 4t - 3t^2$

$$\int_0^s \delta s = \int_0^t (4t - 3t^2) \delta t$$

$$S \Big|_0^s = \frac{4t^2}{2} - \frac{3t^3}{3} \Big|_0^t$$

$$S = 2t^2 - t^3$$

when  $t = 4 \text{ s}$

$$S = 2(4)^2 - (4)^3$$

$$= 96 \text{ m}$$

2  $v = (0.5t^3 - 8t) \text{ m/s}$

$a = ?$

$t = 2 \text{ s}$

$$a = \frac{\delta v}{\delta t}$$

$$a = 1.5t^2 - 8$$

when  $t = 2 \text{ s}$

$$a = 1.5(2)^2 - 8$$

$$= 6 - 8$$

$$= -2 \text{ m/s}^2$$

$$3 \quad a = (4t^2 - 2) \text{ m/s}^2$$

when  $t=0$ ,  $s_0 = 2 \text{ m}$  to the left

"  $t_1 = 2 \text{ s}$ ,  $s_1 = 20 \text{ m}$  to the left

$$t_2 = 4 \text{ s}, s_2 = ?$$

$$s_2 = s_0 + v_0 t + \frac{1}{2} a_c t^2$$

$$= -2 + 0 + \frac{1}{2} (4t^2 - 2)t^2$$

$$= -2 + \frac{1}{2} (4t^4 - 2t^2)$$

$$= -2 + \frac{1}{2} (4(4)^4 - 2(4)^2)$$

$$= -2 + \frac{1}{2} (1,024 - 32)$$

$$= -2 + \frac{1}{2} (992)$$

$$= -2 + 496$$

$$= 494 \text{ m}$$

$$4 \quad v = (20 - 0.05s^2) \text{ m/s}$$

$$a = ?$$

$$\frac{dv}{ds} = 0.1s$$

$$s = 15 \text{ m}$$

$$ds$$

$$a ds = v dv$$

$$a = v \left( \frac{dv}{ds} \right)$$

$$a = 20 - 0.05s^2 (0.1s)$$

$$= 20 - 0.05(15)^2 (0.1 \times 15)$$

$$= 20 - 11.25 (1.5)$$

$$= 20 - 16.875$$

$$= 3.125 \text{ m/s}^2 //$$