

TAIWO OLADIPUPO OLAWALE

18/ENG02/090

COMPUTER ENGINEERING

MECHANICS ASSIGNMENT

The following are snapshots to the solution of the assignments:

$$V = 206$$

$$\int_0^5 15 = \int_0^5 306$$

$$s = [15t^2]_0^5$$

$$s = 15(5)^2 - (15(0)^2)$$

$$s = 15 \times 25$$

$$= 375$$

$$5 \leq t \leq 15$$

$$V = -15t + 22.5$$

$$\int_5^{15} 375 = \int_5^{15} (-15t + 22.5) dt$$

$$s - 375 = \left[\frac{-15t^2 + 22.5t}{2} \right]_5^{15}$$

$$s - 375 = \left[\frac{-15(15)^2 + 22.5(15)}{2} \right] - \left[\frac{-15(5)^2 + 22.5(5)}{2} \right]$$

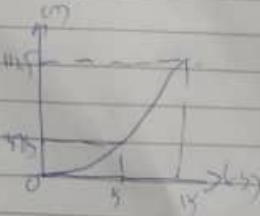
$$s - 375 = \left[\frac{-15 \times 225 + 337.5}{2} \right] - \left[\frac{-15 \times 25 + 112.5}{2} \right]$$

$$s - 375 = (-1697.5 + 337.5) - (-187.5 + 112.5)$$

$$s - 375 = 1160 - 687.5$$

$$s - 375 = 750$$

$$s = 1125$$



TAIWO OLHDI PUPO OLH WALE
18/ENG02/090 COMPUTER ENGINEER



$$v = \frac{ds}{dt} \quad v = 1.5t^2$$

at $t = 6s$

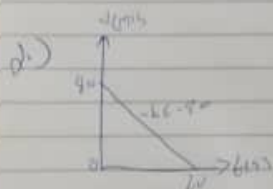
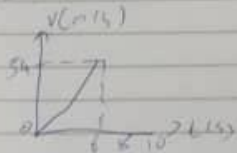
$$v = 1.5 \times 6^2$$

$$= 1.5 \times 36$$

$$v = 54 \text{ m/s}$$

for $t = 6 - 10$, $\therefore v = 54$

$v = 6 \text{ graph}$

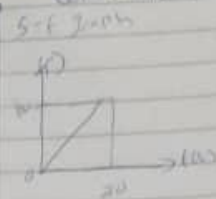


1) $s = \int v dt$, $s = \int (-2t + 80) dt$

$$s = -t^2 + 80t$$

$$s = 20^2 - 2(20)^2 + 80(20)$$

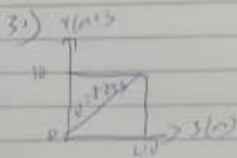
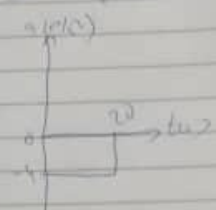
$$s = 1600 - 800 = 800 \text{ m}$$



2) acceleration

$$a = \frac{dv}{dt} \quad a = -4 \text{ m/s}^2$$

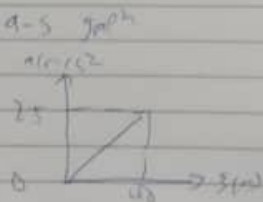
at $t = 20$, $a = -4 \text{ m/s}^2$



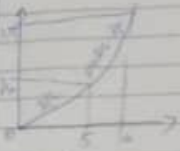
3) $v = 0.25t$

$$a = \left(\frac{dv}{dt}\right) \cdot t, \quad v = 0.25t$$

$$a = 0.25 \text{ m/s}^2$$

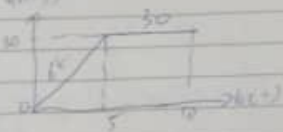


4)



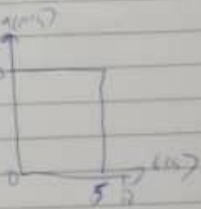
$v = 20/t$, at $t = 5s$
 $v = 6$
 $= 6 \times 5 = 30 \text{ m/s}$
 at $t = 10s$ $v = 30 \text{ m/s}$

$v-t$ graph

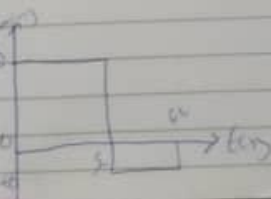


ii) $a = \frac{dv}{dt}$, at $t = 5s$,

$a = 6 \text{ m/s}^2$
 at $t = 10s$
 $a = 0 \text{ m/s}^2$



8)



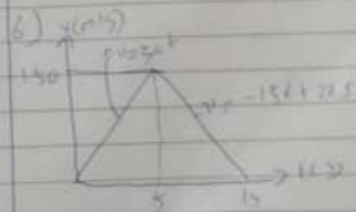
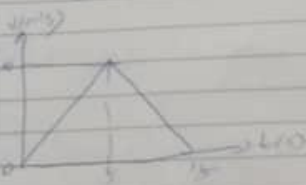
ii) $v_1 = 20/t$, $v_2 = 20/t$

$v_1 = 20/t$
 at $t = 6 = 3.33$
 $v = 20 - 5 = 15 \text{ m/s}$
 $S_2 = 6 \times 5 = 30$

$\int_0^6 v dt = \int_0^6 \frac{20}{t} dt = 20 \ln 6$

$v_{100} = \frac{20}{100} = 0.2$
 $v_{100} = -10t + 50$
 at $t = 6$ $v = 0$
 $0 - 50 = -10 \times 6 + 50$
 $10 \times 6 = 150$
 $t = 15s$

$v-t$ graph



$0 \leq t \leq 5$
 $0 \leq t \leq 15$