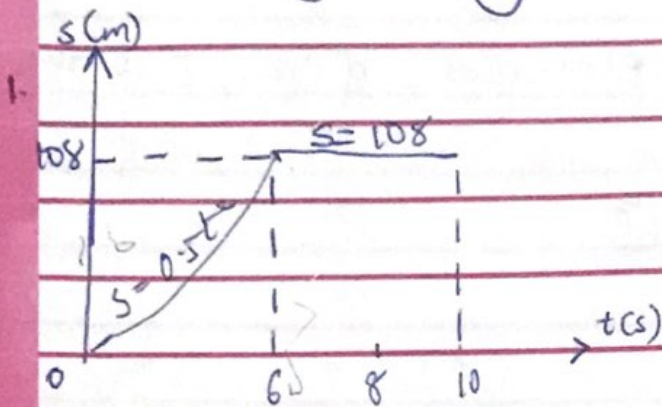


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17/ENG031027 C/O.

Civil Engineering



$$v = \frac{ds}{dt}$$

$$v = 1.5t^2$$

at $t = 6s$

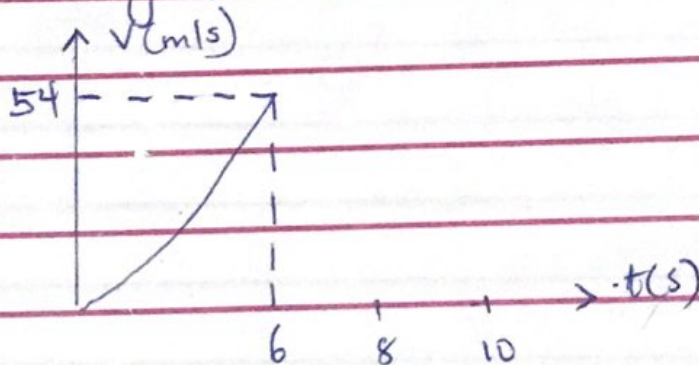
$$v = 1.5 \times 6^2 = 1.5 \times 36 -$$

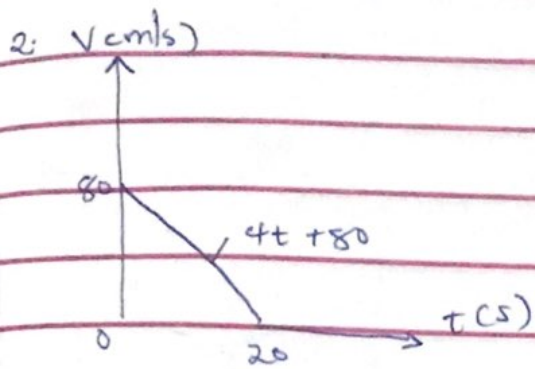
$$v = 54 \text{ m/s}$$

from $t = 6s - 10s$, $s = 108$

$$\therefore v = 0$$

v-t graph





$$i) s = \int v dt$$

$$s = \int (-4t + 80)$$

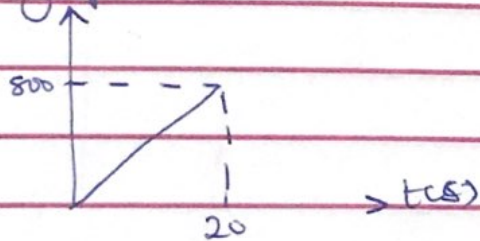
$$s = -2t^2 + 80t$$

$$\text{at } t = 20 \text{ s}$$

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

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

s - t graph:



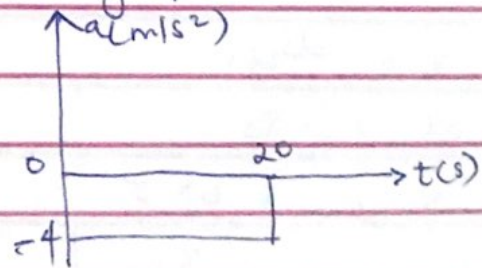
(ii) acceleration

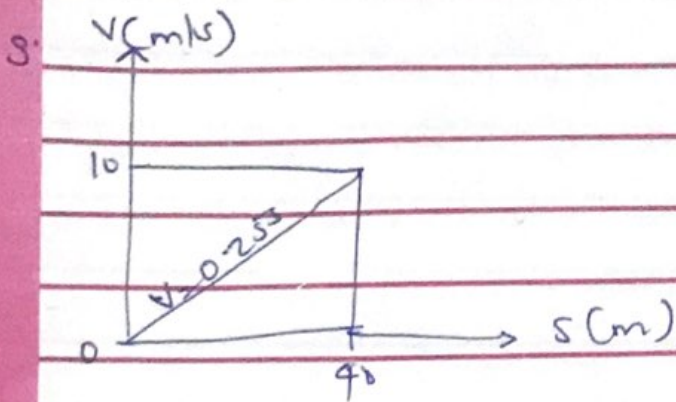
$$a = dv/dt$$

$$\therefore a = -4 \text{ m/s}^2$$

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

a - t graph





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

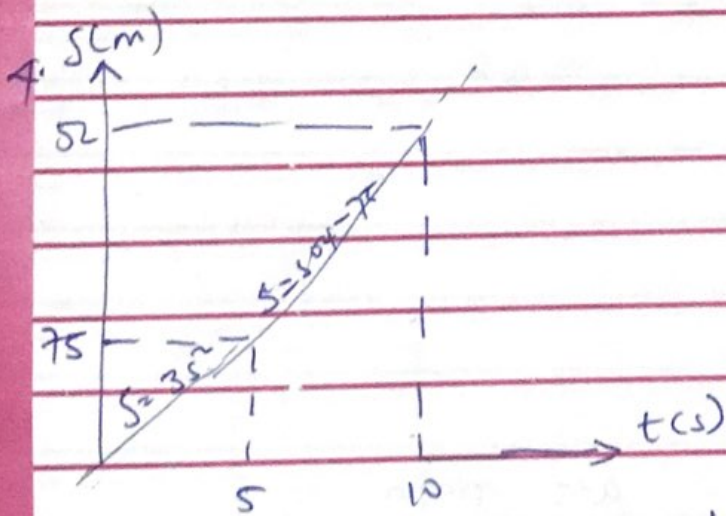
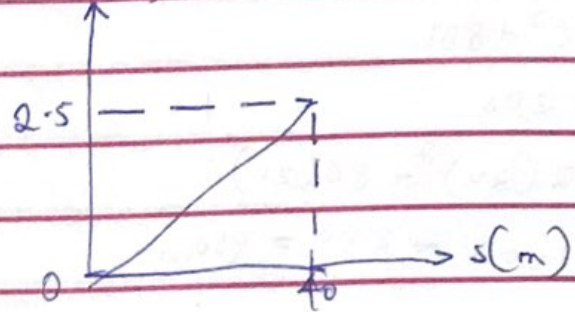
$$v = 0.25t$$

$$a = 10 \times \left(\frac{dv}{dt} \right) \Big|_{t=40}$$

$$a = 10 \times 0.25$$

$$a = 2.5 \text{ m/s}^2$$

a-s graph
 $a \text{ (m/s}^2\text{)}$



$$(i) v = \frac{ds}{dt}$$

$$\text{at } t = 5 \text{ s}$$

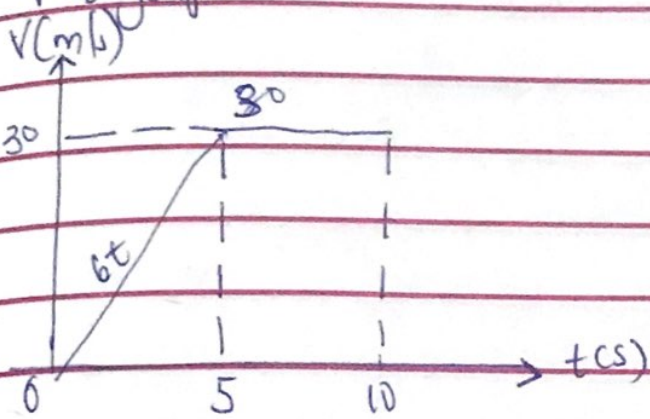
$$v = 6t = 6 \times 5$$

$$= 30 \text{ m/s}$$

$$\text{at } t = 10 \text{ s}$$

$$v = 30 \text{ m/s}$$

v-t graph



ii) $a = \frac{dv}{dt}$

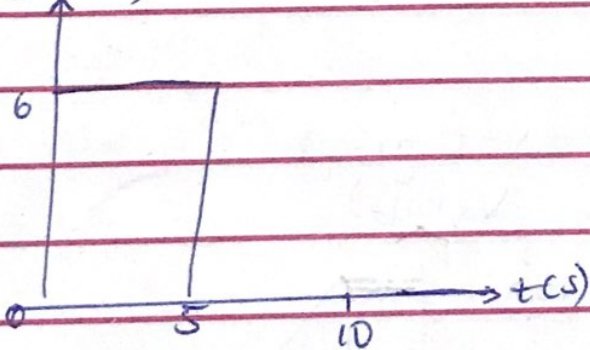
at $t = 5$ s

$a = 6 \text{ m/s}^2$

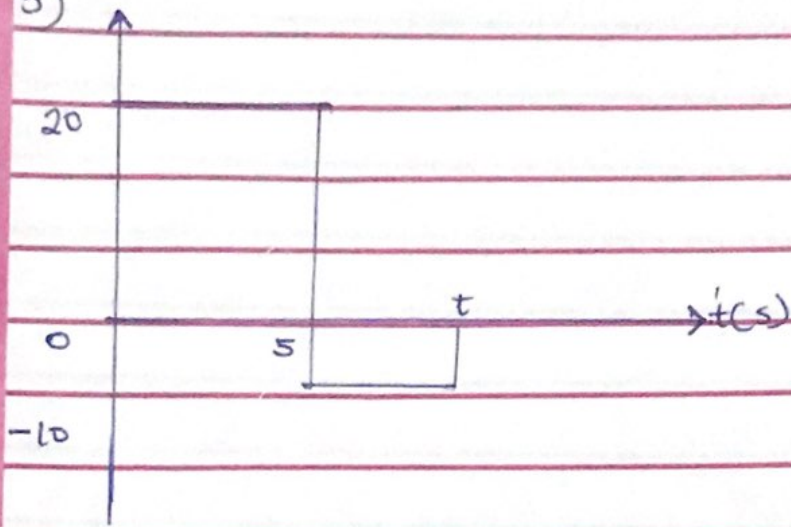
at $t = 10$ s

$a = 0 \text{ m/s}^2$

a (m/s²)



5)



$$v = \int a dt$$

$$v = \int 20 dt$$

$$v = 20t$$

at $t = 5s$

$$v = 20 \times 5 = 100 \text{ m/s}$$

$$5s < t \leq t'$$

$$\int_{100}^v dv = \int_5^{t'} -10 dt$$

$$v - 100 = -10t \Big|_5^{t'}$$

$$v - 100 = -10t' + 10(5)$$

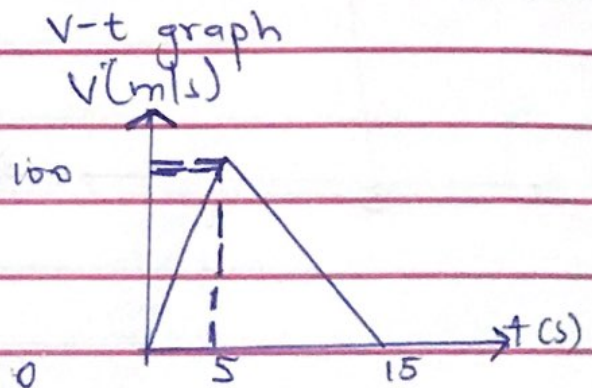
$$v - 100 = -10t' + 50$$

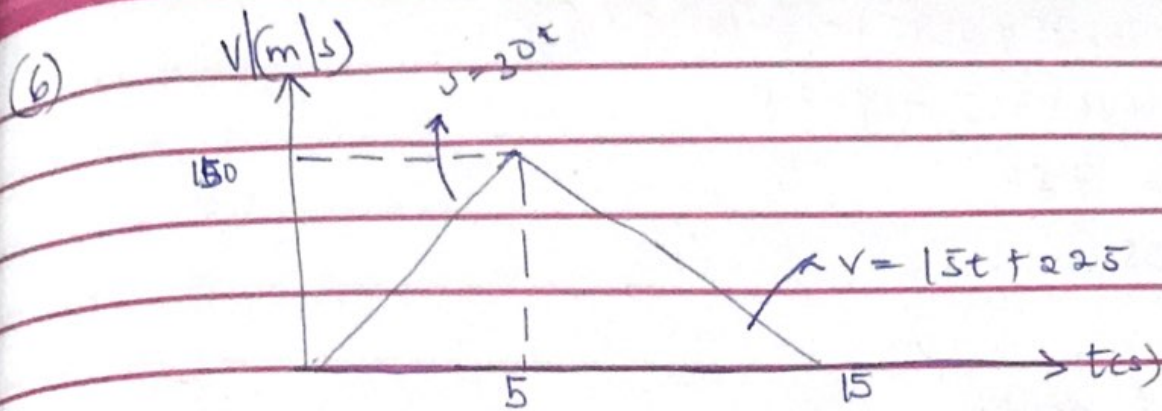
at t' , $v = 0$

$$0 - 100 = -10t' + 50$$

$$10t' = 150$$

$$t' = 15s$$





$$0 \leq t \leq 5s$$

$$V = 30t$$

$$\int_0^5 ds = \int_0^5 30t dt$$

$$s = 15t^2 \Big|_0^5$$

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

$$s = 15 \times 25$$

$$s = 375m$$

$$5s \leq t \leq 15s$$

$$V = -15t + 225$$

$$\int_{375}^s ds = \int_5^{15} (-15t + 225) dt$$

$$s - 375 = \frac{-15t^2}{2} + 225t \Big|_5^{15}$$

$$s - 375 \left[\frac{75(15)^2}{2} + 225(15) \right] - \left[\frac{15(5)^2}{2} + 225(5) \right]$$

$$s - 375 = \left[\frac{75 \times 225}{2} + 3375 \right] - \left[\frac{-15 \times 25}{2} + 1125 \right]$$

$$s - 375 = (-1687.5 + 3375) - (-187.5 + 1125)$$

$$s - 375 = +1687.5 - 937.5$$

$$s - 375 = 750$$

$$s = 1125 \text{ m}$$

s-t graph

