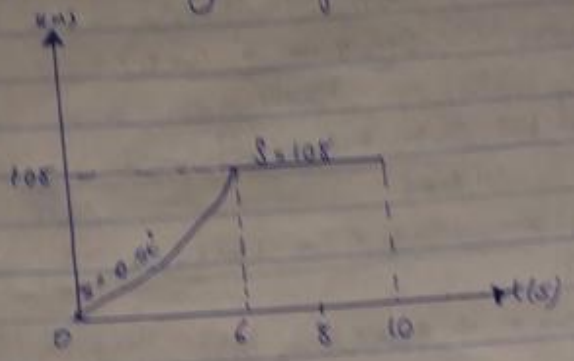


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 Electrical Engineering

1)



$$v = ds/dt$$

$$v = 1.5t^2$$

at $t = 6s$

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

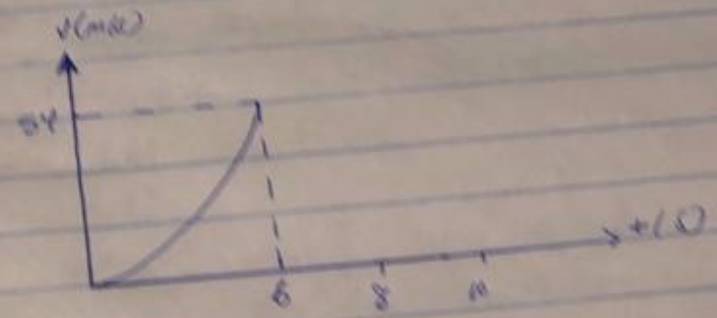
$$= 1.5 \times 36$$

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

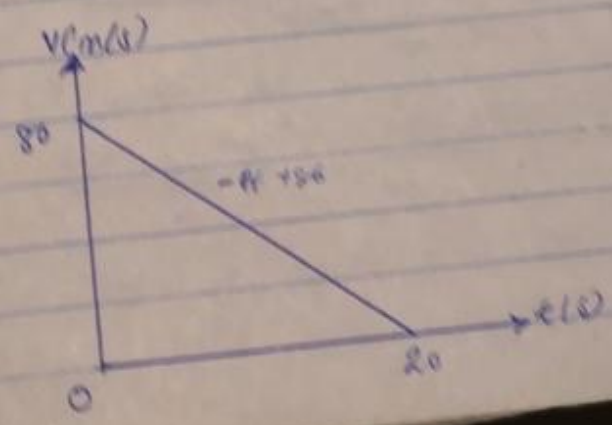
from $t = 6s$ to $10s$, $s = 108$

$$\therefore v = 0$$

v-t graph



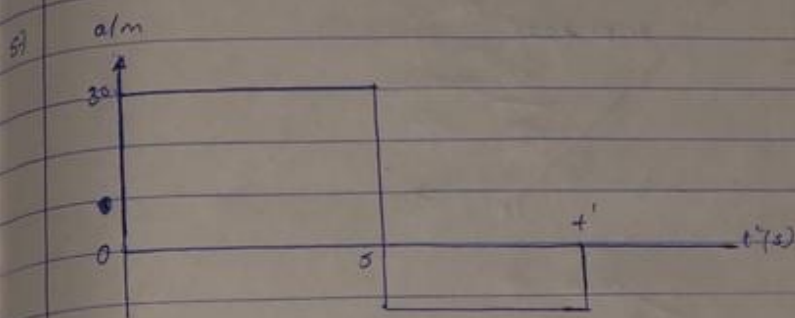
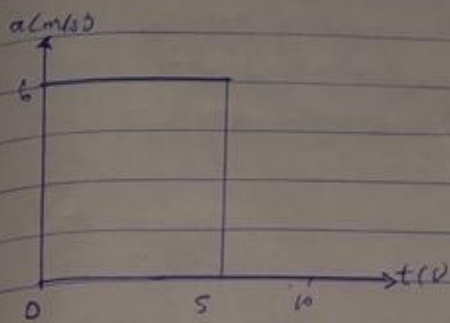
2)



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

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

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



$$(1) v = \int a dt$$

$$v = \int 20 dt$$

$$v = 20t$$

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

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

$$5 \text{ s} < t < t'$$

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

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

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

$$\text{at } t' \quad v = 0$$

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

$$10t' = 150$$

$$t' = 15 \text{ s}$$

$$a = \frac{dv}{dt} v$$

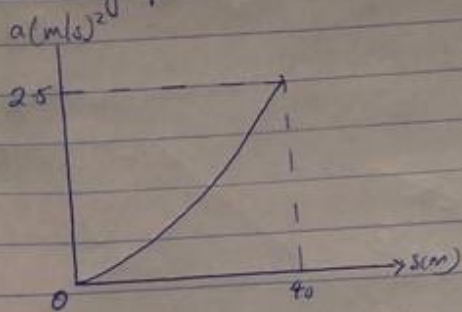
$$v = 0.25s$$

$$a = 10 \times d(0.25) / ds$$

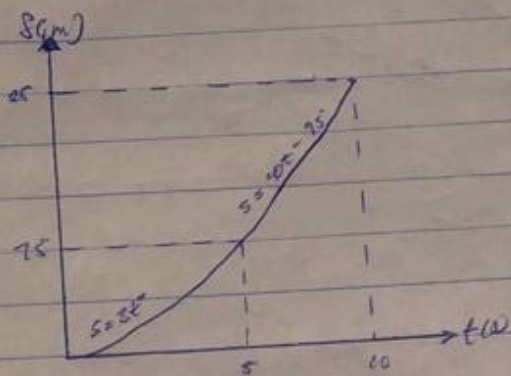
$$a = 10 \times 0.25$$

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

a-s graph

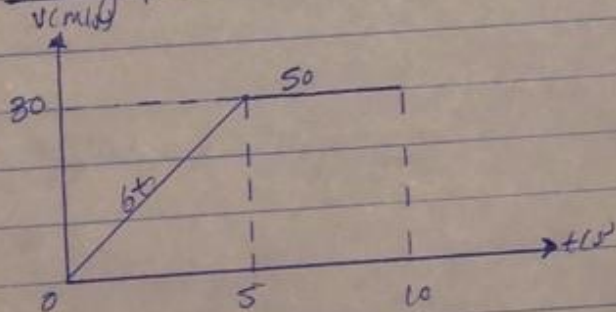


④



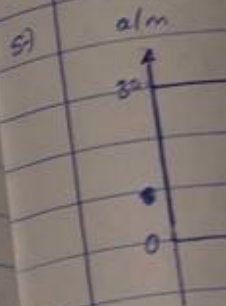
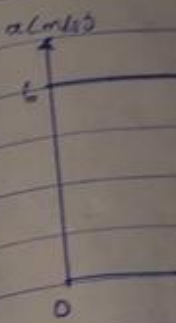
i) $v = ds/dt$
 at $t = 5s$
 $v = 6t = 6 \times 5$
 $= 30 \text{ m/s}$

V-t graph



ii) $a = dv/dt$
 at $t = 5s$

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



(i) $v =$
 $v =$

$v =$

$v =$

$v =$

$$s = \int v dt$$

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

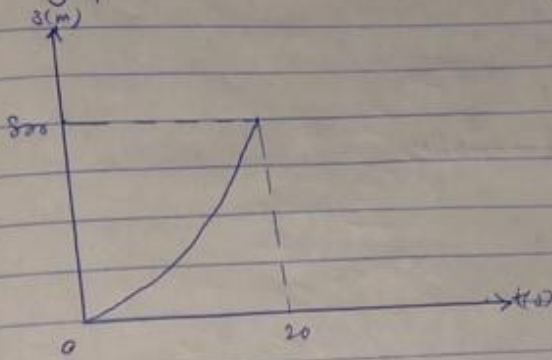
$$s = -2t^2 + 80t$$

at $t = 20s$

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

$$s = 1600 - 800 = 800m$$

s-t graph



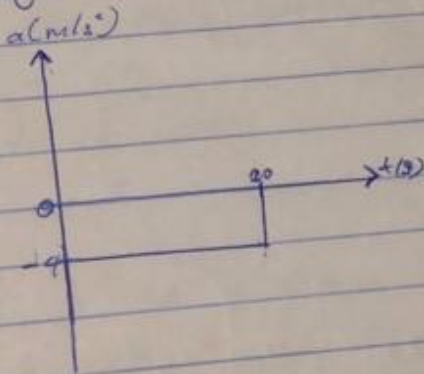
acceleration

$$a = dv/dt$$

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

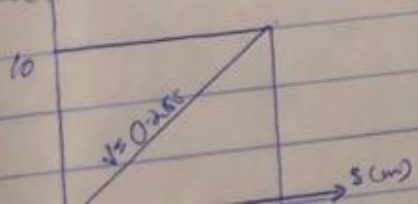
$$\text{at } t = 20s, a = -4 \text{ m/s}^2$$

a-t graph



3)

v(m/s)



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

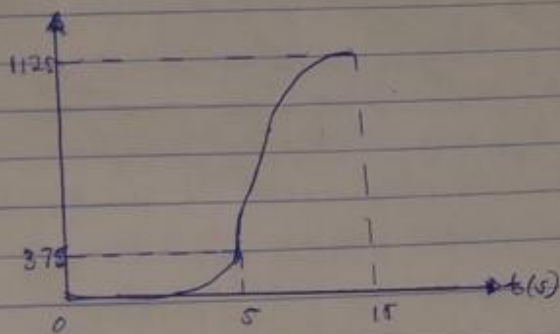
$$s - 375 = +1687.5 - 937.5$$

$$s - 375 = 750$$

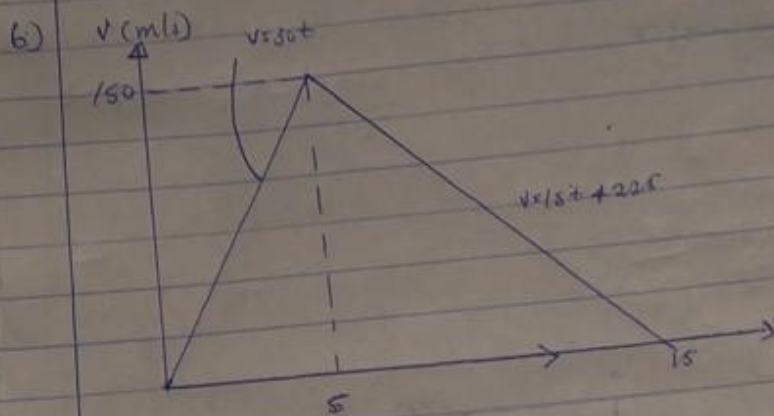
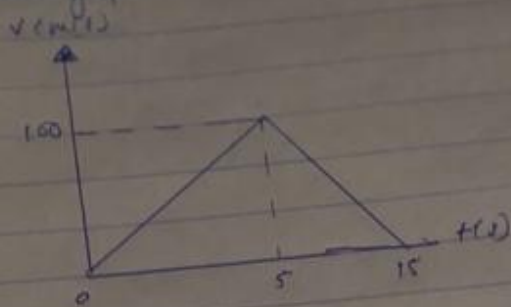
$$s = 750 + 375$$

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

s-t graph



v-t graph



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

$$v = 30t$$

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

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

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

$$s = 15 \times 25$$

$$s = 375$$

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

$$v = -15t + 225$$

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

$$s = 375 =$$

$$\left[\frac{-15(t^2)}{2} + 225(t) \right]_5^{15} = \left[\frac{15(s)^2}{2} + 225(s) \right]$$

$$s = 375 + (-15 \times 25)$$

$$s = 375 - 375$$

$$s = 375 - 375$$

$$s = 750 - 375$$

$$s = 1125m$$

s-t graph

