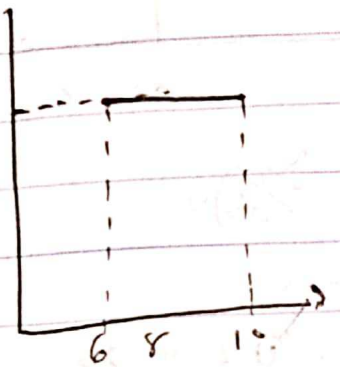
CHARLES AMACHREE PRINCE HIGHCOM
18/ENG04/024
ELECT--ELEC

1



$V = dx/dt$; $V = 1.5t^2$

at $t = 6s$

$V = 1.5 \times 6^2$

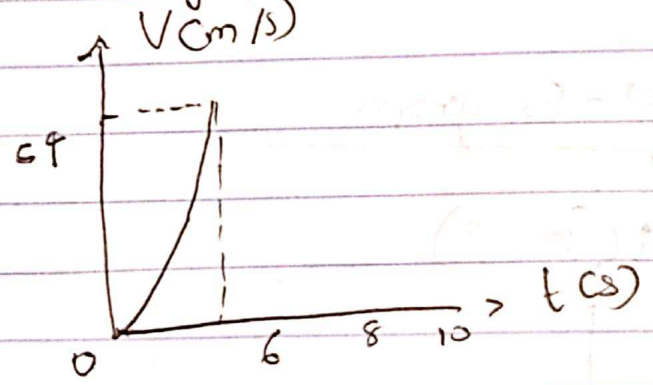
$= 1.5 \times 36$

$V = 54 m/s$

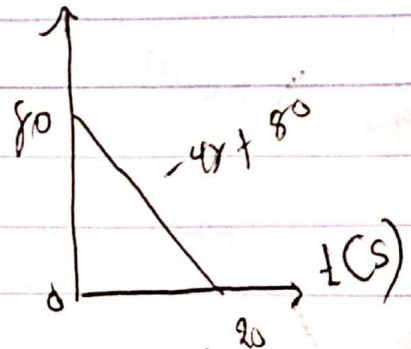
From $t = 6s - 10s$ $S = ?$

$\therefore V = 0$

V-t graph



②



① $S = \int_0^{20} V\,dt$

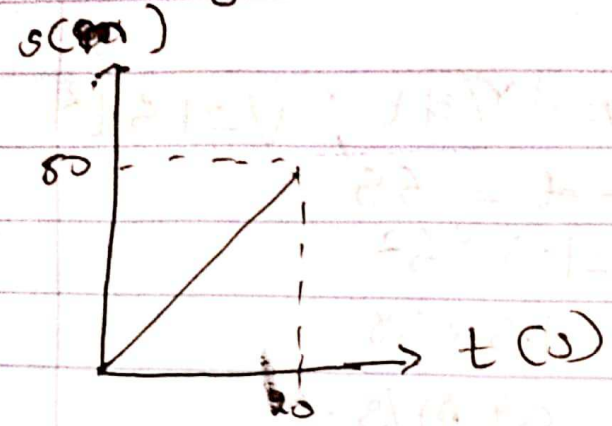
$S = \int(-4t + 80)$; $S = -2t^2 + 80t$

at $t = 20s$; $S = -2(20)^2 + 80(20)$

~~$S = -2(20)^2$~~

$S = 1600 - 1800 = 800m$

s-t graph



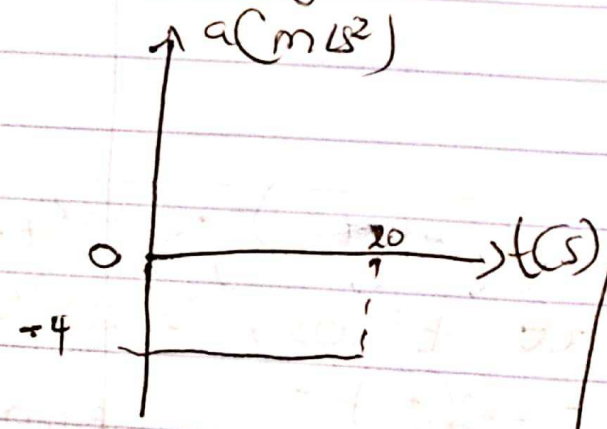
(ii) Acceleration

$a = dv/dt$

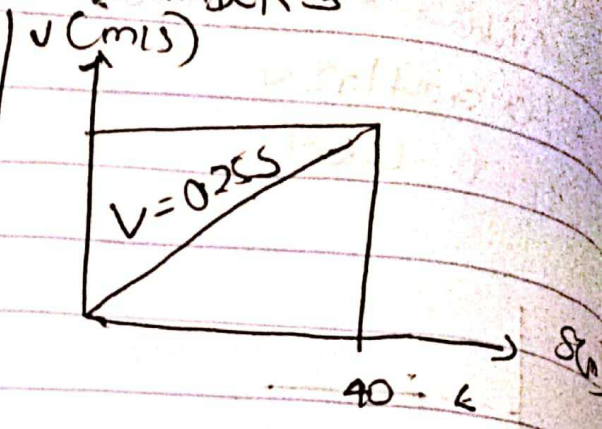
$\therefore a = -4 m/s^2$

at $t = 20s$, $a = -4 m/s^2$

a-t graph



NUMBER 3



$a = (dv/ds)v$

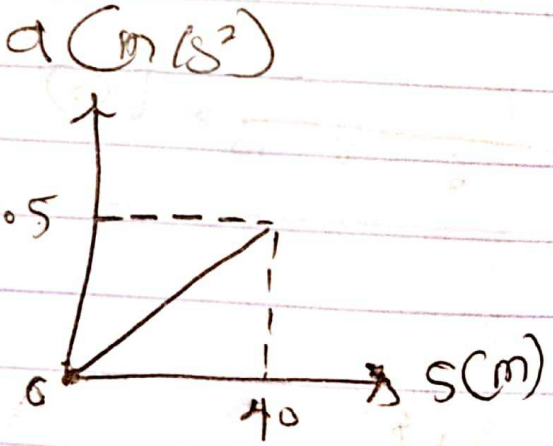
$v = 0.025s$

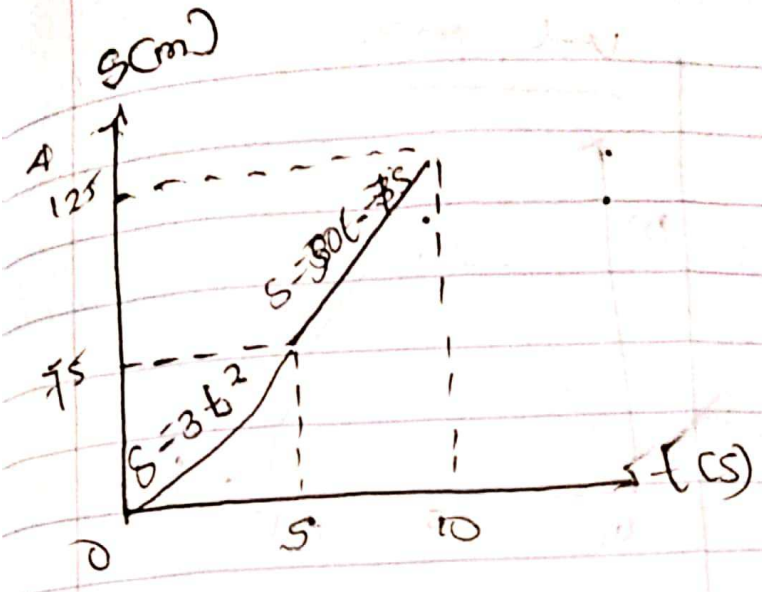
$a = 10 \times d(0.25s)/ds$

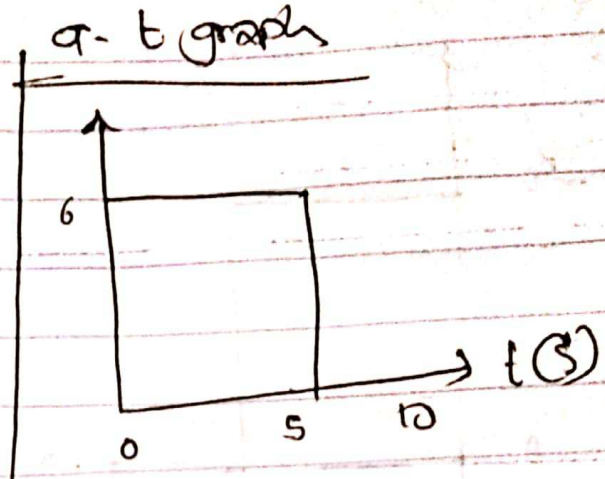
$a = 10 \times 0.25$

$a = 2.5 m/s^2$

a-s graph







(i) $V = ds/dt$

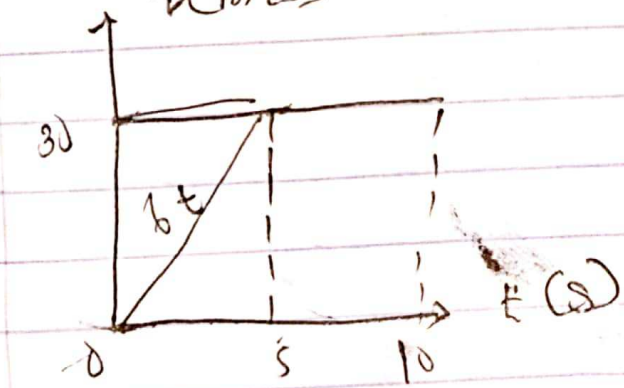
at $t = 5s$ $\quad V = 6t = 6 \times 5$

$= 30 m/s$

at $t = 10s$

$V = 30 m/s$

v-t graph

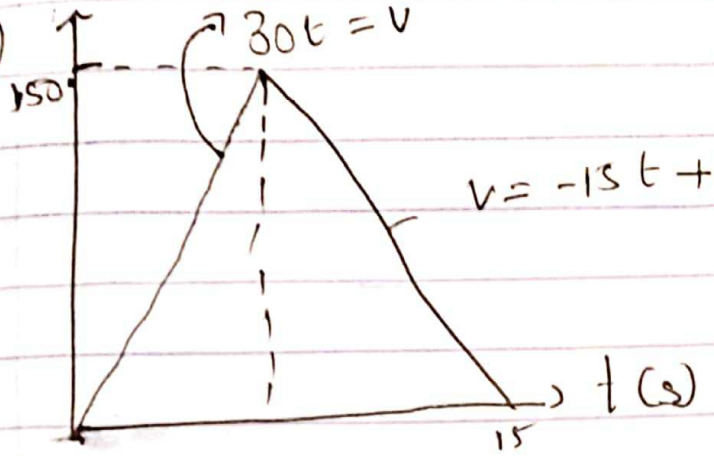


(ii) $a = dV/dt$, at $t = 5s$

$a = 6 m/s^2$ at $t = 10s$

$a = 0 m/s$

b)



$0 \le t \le 5$, $V = 30t$ $\quad \int_0^s ds = \int_0^5 30t \Rightarrow$

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

$S = 15 \times 25 = 375$ $\quad \therefore 5 < t \le 15$

$v = -15t + 225$

$\int_1^S ds = \int_5^{15} (-15t + 225)\,dt \Rightarrow S - 375 = \frac{15t^2}{2} + 225t \Big|_5^{15}$

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

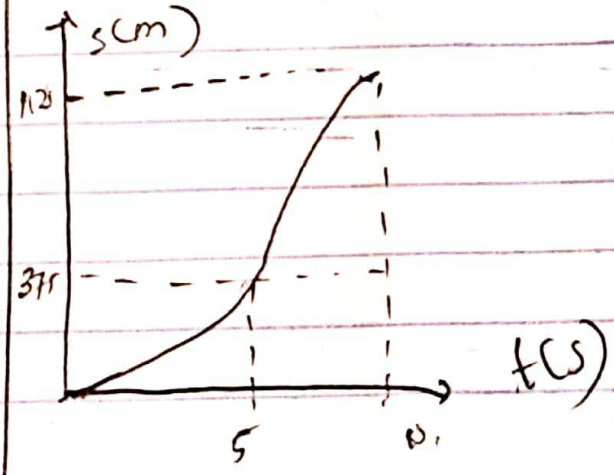
$S - 375 = (-1687.5 + 3375) - (-187.5 + 1125)$

$S = 375 = 750$

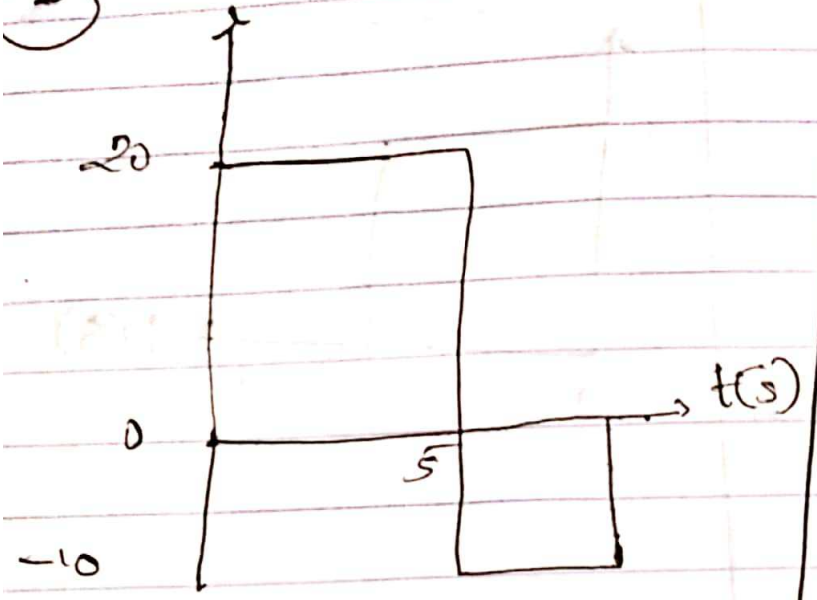
$S = 1125\,m$

Stgrapl

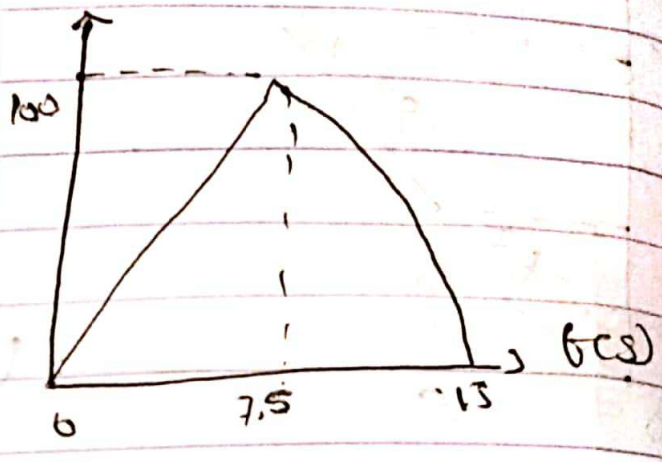
Sln



(5)



v-t graph



$v = \int a\,dt \; ; \; v = \int 20\,dt$

$v = 20t$

at $t = 5s, \; v = 20 \times 5 = 100 m/s$

$5s < t \leq t'$

$\int_{100}^{v} dv = \int_{5}^{t'} -10\,dt$

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

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

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

at t', $v = 0$

$0 - 100 = -10t + 50$

$10t' = 150$

$t' = 15s$