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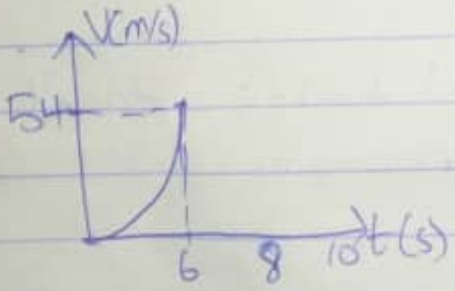
18/ENG02/074
COMPUTER ENGINEERING

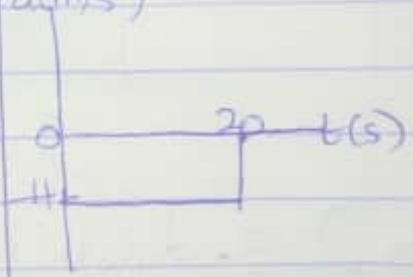
1) 

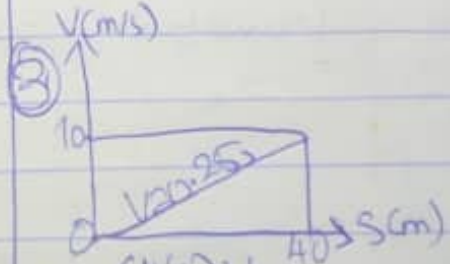
V = ds/dt, V = 1.5t²
at t=6s, V = 1.5×6² = 54m/s

∴ From 6s to 10s S=108, ∴ V=0

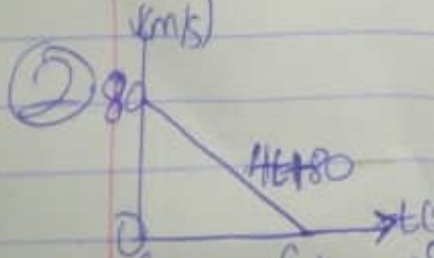


i) a = dV/dt = −4m/s²
t=20s, a = −4m/s²

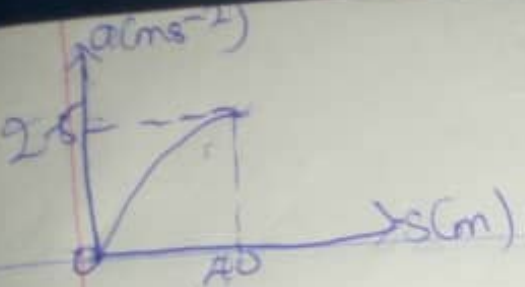


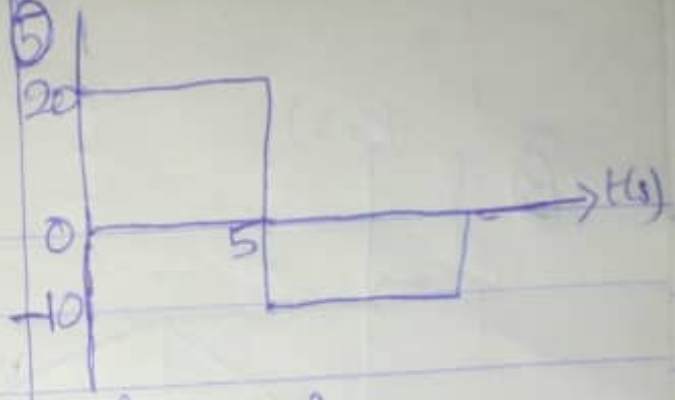
3) 

a = (dV/ds)V
V = 0.25s
a = 10×(0.25)d/ds
a = 10×0.25 = 2.5m/s²

2) 

i) S = ∫V dt = ∫(−4t+80)
ii) S = −2t²+80t, t=20s
S = −800+1600 = 800m



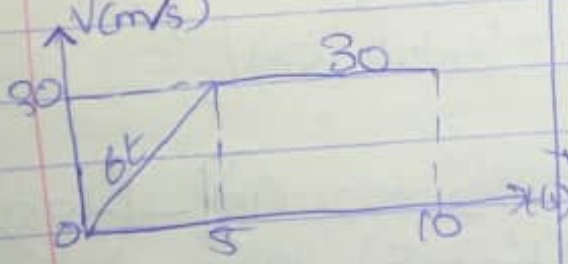


(4)

i) $V = ds/dt$, $t = 5s$, $V = 6t$

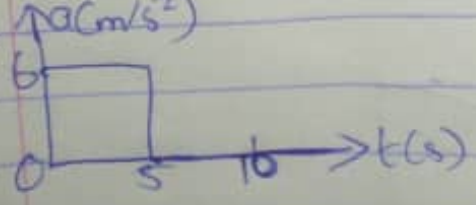
$V = 6 \times 5 = 30 m/s$

$t = 10s$, $V = 3 \times 10 = 30 m/s$



ii) $a = dV/dt$, $t = 5s$, $a = 6 m/s^2$

at $t = 10s$, $a = 0$



5m/s²

i) $V = \int a\,dt$, $= \int 20\,dt$

$V = 20t$, $t = 5s$

$V = 20 \times 5 = 100 m/s$

$\int dv = \int -10\,dt$

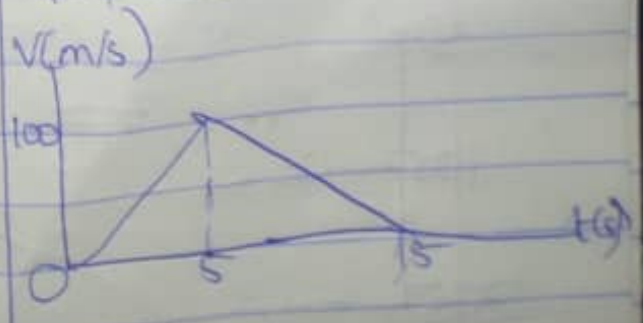
$V - 100 = -10t|_5^t$

$V - 100 = -10t + 10(5)$

$V - 100 = -10t + 50$

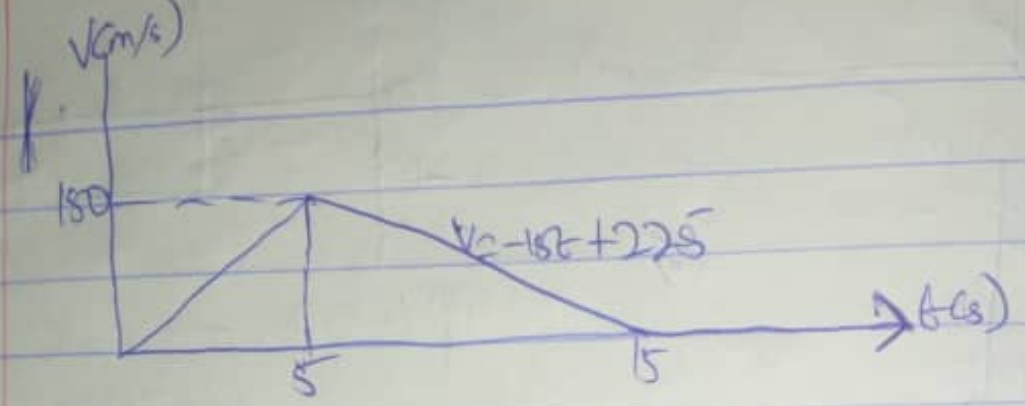
$0 - 100 = -10t + 50$

$10t = 150$, $t = 15s$



225
150
375

⑥



$0 \le t \le 5_s$, $V = 30t$

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

$S = 15t^2 \Big|_0^5 = 15(5)^2 - 15(0)^2 = 15 \times 25 = 375m$

$5 \le t \le 15_s$

$V = -15t + 225$

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

$S - 375 = (-15/2 t^2 + 225t) \Big|_5^{15}$

$S - 375 = [-15(15)^2/2 + 225(15)] - [-15(5)^2/2 + 225(5)]$

$S - 375 = (1687.5) - (937.5)$

$S - 375 = 750$

$S = 750 + 375 = 1125m$