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ENG 234 18/ENG02/094

COMPUTER ENGINEERING

① $V = (4t - 3t^2)\ m/s$, $t = 4s$

$V = ds/dt$, $ds = Vdt$

$\int ds = \int V$

$x = \frac{4t^2}{2} - \frac{3t^3}{3} + C$

$x = 2t^2 - t^3 + 0$

$\therefore x = 2(4)^2 - 4^3$

$= 32 - 64 = -32$

$\therefore x = 32m$ to the left of Origin

② $a = 4t^3 - 2$, $V = \int a dt$, $S = 20, t = 2$

$V = \frac{4t^3}{3} - \frac{2t}{1} + C$

$V = 4t^3/3 - 2t + C$

$S = \int V dt$

$= \frac{4}{3}\frac{t^4}{4} - 2t^2/2 + C^2/2$

$\therefore S = t^4/3 - t^2 + C^2/2$

$20 = 16/3 - 4 + C^2/2$

$56/3 = C^2/2$

$C^2 = 112/3 = 6.11$

$\therefore S = \frac{t^4}{3} - t^2 + C^2/2 \quad (t = 4)$

$= \frac{4^4}{3} - 4^2 + 56/3$

$S = \frac{256}{3} - \frac{16}{1} + \frac{56}{3}$

$\frac{256 - 48 + 56}{3}$

$S = \frac{256 - 48 + 56}{3} = 88m$

③ $a(t) = (4t^2 - 2)\ m/s^2$

$t = 2s$

$\frac{d}{dt}(v) = 0.5t^3 - 8 = 1.5t^2 - 8$

$a(t) = 1.5t^2 - 8$

when $t = 2s$

$a(2) = 1.5(4) - 8$

$= 6 - 8$

$= -2\ m/s$

④ $V(t) = 20 - 0.05s$

$\frac{dV}{dt} = 0 - 0.15$

$\frac{dv}{dt} = -0.15$

$a(t) = -0.1 \times 15$

$= -1.5\ m/s^2$