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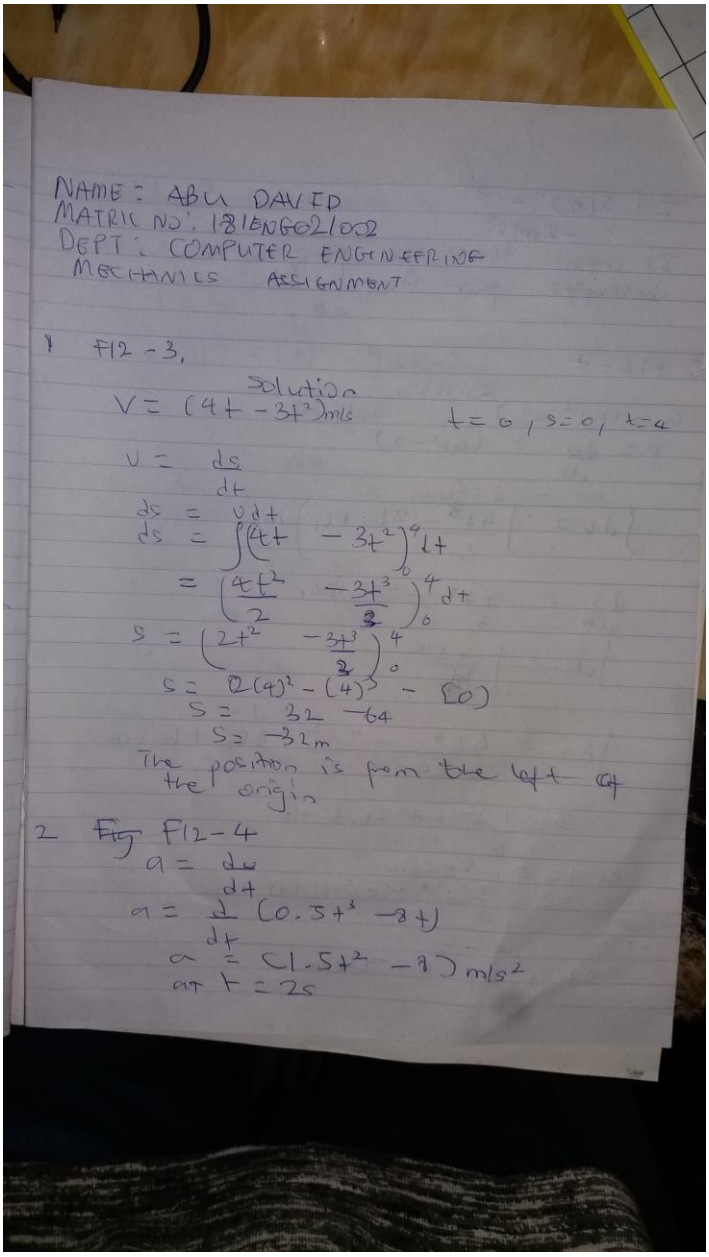
DEPT: COMPUTER ENGINERING

MARTIC NO: 18/ENG02/002

MECHANICS ASSIGNMENT



$= 1.5(2)^2 - 8$

$= -2 m/s^2$

It means that the particle decelerates per its position

(3) F12-7

Solution

$a = (4t^2 - 2)$

$a = \frac{dv}{dt} = (4t^2 - 2)$

$\int dv = \int \left(\frac{4t^3}{3} - 2t + C_1\right) m/s$

$\frac{ds}{dt} = \frac{4}{3}t^3 - 2t + C_1$

~~$\int ds = \int \frac{4t^4}{4}$~~

$\int ds = \frac{4t^4}{3 \times 4} - \frac{2t^2}{2} + (C_1 + C_2) m$

$s = \frac{1}{3}t^4 - t^2 + C_1 t + C_2$

At $t = 0$, $s = -2m$

$-2 = \frac{1}{3}(0)^4 - (0)^2 + (C_1)(0) + C_2$

$C_2 = -2$

At $t = 2$, $s = 2.2m$

$-20 = \frac{1}{3}(2)^4 - (2)^2 + c_1(2) - 2$

$2c_1 = -19.33$

$c = -9.67$

At $t = 4s$, $s = ?$

$s = \frac{1}{3}(4)^4 - (4)^2 - 9.67(4) - 2$

$s = \frac{256}{3} - 56.6668$

$s = 28.667$

So the position is positive in the particle

F12-9

solution

$a = \frac{dv}{dt} = \frac{dv}{ds} \times \frac{ds}{dt}$

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

$\frac{dv}{ds} = -1.5$

$a = (20 - 0.05s^2)(-1.5)$

$(20 - 11.25)(-1.5)$

$a = (8.75)(-1.5)$

$a = -13.125 m/s^2$

$a = -13.13 m/s^2$

It means the particle is decelerating