4. A particle starts from the origin at $t = 0$ with an initial velocity of $3.0\hat{i}$ m/s and moves in the x-y plane with a constant acceleration $(6.0\hat{i} + 4.0\hat{j})$ m/s^2. The x-coordinate of the particle at the instant when its y-coordinate is 32 m is D meters. The value of D is:

[Main 9 Jan. 2020 (II)]

(a) 32 (b) 50 (c) 60 (d) 40

4. (c) Using $S = ut + \frac{1}{2}at^2$

$y = u_y t + \frac{1}{2}a_y t^2$ (along y Axis)

$\Rightarrow \quad 32 = 0 \times t + \frac{1}{2}(4)t^2 \quad \Rightarrow \quad \frac{1}{2} \times 4 \times t^2 = 32 \quad \Rightarrow t = 4\,s$

$S_x = u_x t + \frac{1}{2}a_x t^2$ (Along x Axis)

$\Rightarrow \quad x = 3 \times 4 + \frac{1}{2} \times 6 \times 4^2 = 60$