

the direction of force is  
South-west direction.

④ A body of mass 5 kg is acted upon by a force  $\vec{F} = (3\hat{i} + 4\hat{j})\text{N}$ . If its initial velocity at  $t=0$  is  $\vec{v} = (6\hat{i} - 12\hat{j})\text{ms}^{-1}$  the time at which it will just have a velocity along the y-axis is:

(A) never (B) 10s (C) 2s (D) 15s

Ans:- (B)

$$\text{Since } \vec{a} = \frac{\vec{F}}{m} \Rightarrow \vec{a} = \frac{1}{5}(-3\hat{i} + 4\hat{j}) \text{ m/s}^2$$

Now, since the x-component of the final velocity is zero,  $\Rightarrow v_x = u_x + a_x t$

$$\Rightarrow 0 = 6\hat{i} + \frac{-3\hat{i}}{5} t$$

$$\Rightarrow t = 10\text{s}$$