CW

Page 85

Home Assignment

17. The motion is uniform

2) The distance travelled by A is calculated as $S_A = 10t$ (velocity is given as 10m/s) and that of B is calculated as $S_B = \frac{1}{2}at^2 = \frac{1}{2}t^2$ ($A_{sa} = \tan 45^\circ = 1$)

Initially A is 10.5m ahead of B, thus we get $S_A + 10.5 = \frac{1}{2}t^2$

Thus we get the equation as

$10.5 + 10t = \frac{1}{2}at^2$

$t^2 - 20t - 21 = 0$

$t = \frac{20 \pm \sqrt{400+84}}{2}$

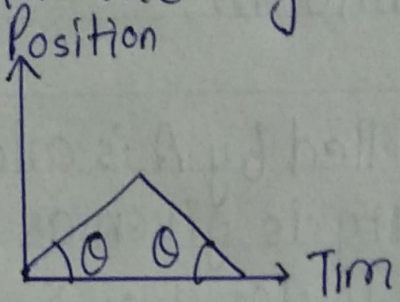
$t = 21$ sec

8.

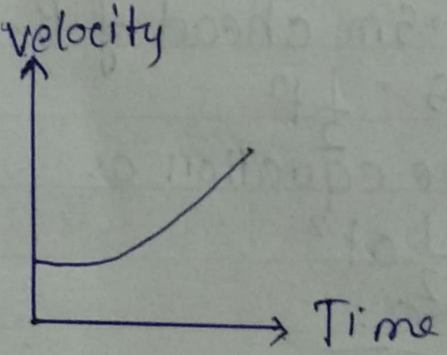
CW

③

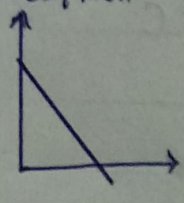
a) Particle moving with constant speed



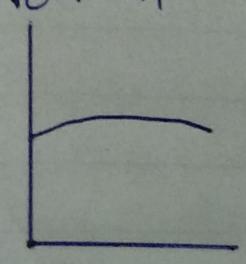
b) Particle moving with increasing acceleration.



c) Particle moving with constant negative acceleration



d) Particle moving with zero acceleration



(4)

a) Constant velocity (A to B)
Non-uniform Negative acceleration (B to C)

b) From A to B the object has zero acceleration because the object travels 40 m/s in every 5 secs.

c) From B to C there is negative acceleration because in every 5 seconds the velocity is decreasing.

5a) OA = Uniform Acceleration
AB = Constant Velocity

b) Velocity after 10 secs = $\sqrt{10^2+20^2}$ = $\sqrt{500}$
= $10\sqrt{5}$ m/s

After 40s = $2 \times 10\sqrt{5} + (20)^2$
= 500 + 400
= 900 m/s

(iii) Negative acceration = $\tan\theta = \frac{20}{10} = 2\ m/s^2$

(9v) The distance covered by the body between 10th and 30th second

$S_{10th} = 0 + \frac{2}{2}(2\times10-1)$

$= 19\ m$

$S_{30th} = 0 + \frac{2}{2}(30\times2-1)$

$= 59\ m$

So, the distance b/w 10th & 30th second

$= 59 - 19\ m = 40\ m$