

HW

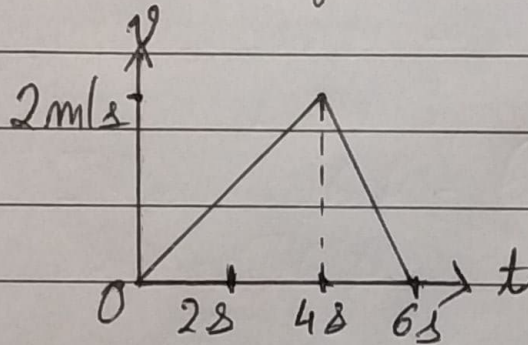
28/06/2021

Chapter :- 1

Motion

Home Assignment

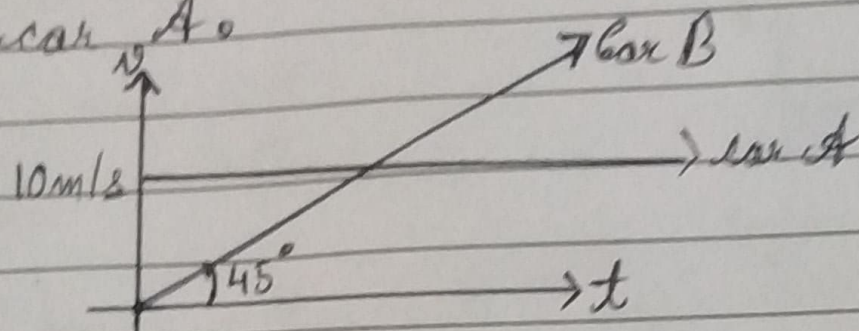
1) The velocity-time graph of a particle moving along a straight line is as shown in figure. Which of the following is/are incorrect for this motion?



- a) The motion is uniform
- b) The acceleration is uniform
- c) The particle changes its direction of motion.
- d) The displacement during the period 0-4 s is equal to the area under the ~~and~~ velocity-time graph for this period.

- ans) a) The motion is uniform
b) The acceleration is uniform.

2) Initially car A is 10.5 m ahead of car B. Both start moving at time $t=0$ in the same direction along a straight line. The velocity-time graph of two cars is shown in figure. Find the time (in sec) when the car B will catch the car A.



ans) From Graph -

slope of $v-t$ graph gives acceleration

$$\therefore a \text{ of Car A} = 0 \text{ m/s}^2$$

$$a \text{ of Car B} = 1 \text{ m/s}^2$$

Now,

$$s_A = ut + \frac{1}{2} at^2$$

$$= 10 \times t + \frac{1}{2} \times 0 \times t^2$$

$$= 10t \quad (u = 10 \text{ m/s given in graph})$$

$$s_B = ut + \frac{1}{2} at^2$$

$$= 0 \times t + \frac{1}{2} \times 1 \times t^2$$

$$= \frac{t^2}{2}$$

Now, so if we subtract distance B from distance A we get 10.5 m

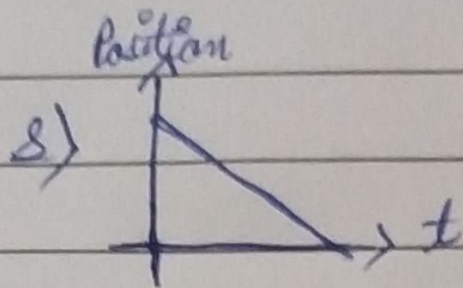
$$s_B - s_A = 10.5$$

$$\rightarrow \frac{t^2}{2} - 10t = 10.5 \Rightarrow t^2 - 20t - 21 = 0$$

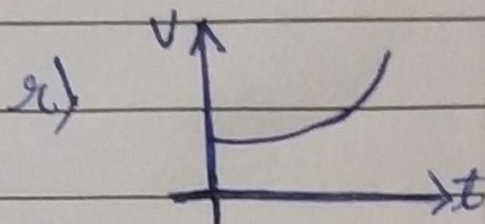
$$t = 21 \text{ seconds, } -1 \text{ sec}$$

3) Match the situation given in column I with the possible curves in column II.

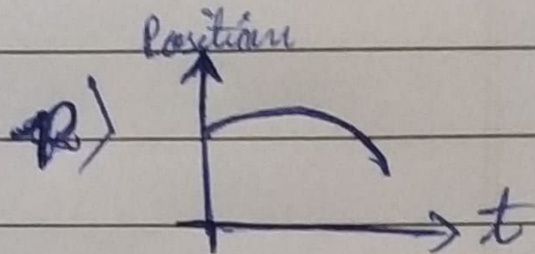
a) Particles moving with constant speed



b) Particle moving with increasing acceleration



c) Particle moving with decreasing acceleration



d) Particle moving with zero acceleration

