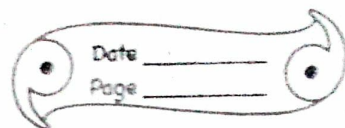


MOTION



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?

iii The Particle changes its direction of motion.

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 a of A = 0 m/s^2 , a of B = 1 m/s^2 .

$$S_A = ut + \frac{1}{2}at^2 = 10t + \frac{1}{2} \times 0 \times t^2 = 10t.$$

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

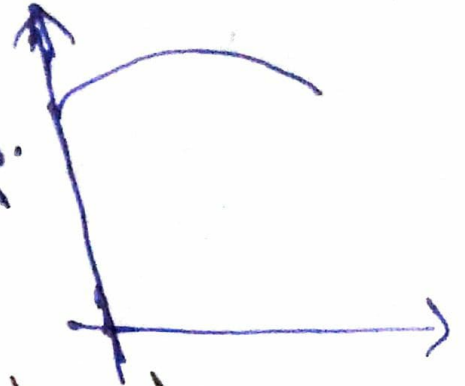
$$S_B - S_A = 10.5 \Rightarrow \frac{t^2}{2} - 10t = 10.5$$

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

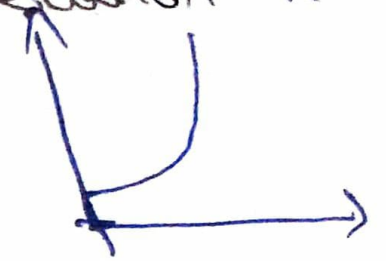
$$\Rightarrow t = 21 \text{ sec} - 1 \text{ sec}.$$

Time = 21 seconds.

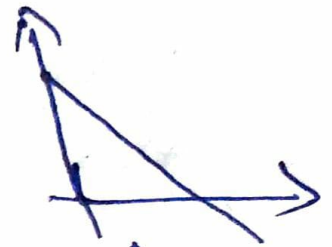
3 a. Particle moving with constant speed - v .



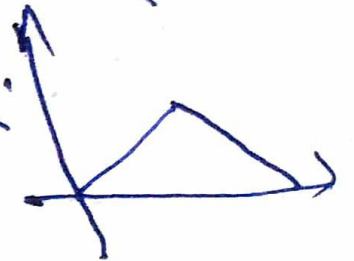
b. Particle moving with increasing acceleration - a .



c. Particle moving with constant negative acceleration - a .



d. Particle moving with zero acceleration - a .



4a State the kind of motion that object has from A to B and from B to C.

Ans Non-Uniform Motion (B to C); Uniform Motion (A to B).

b Identify the part of graph where the object has zero acceleration. Give reason for your answer.

Ans ^C Because, here the object stops due to zero acceleration. Give Reason.

c Identify the part of graph where the object has

Ans B. From here, the acceleration of the object decreases non-uniformly.

5i State the kind of motion reported by OA, AB?

Ans Uniform Motion.

ii What is the velocity of the body after 10s and after 40s?

Ans After 10s = 20 m/s; After 40s = 20 m/s.

iii Calculate negative acceleration of the body.

Ans 20 m/s^2 .

iv Calculate the distance covered by the body between 10th and 30th second?

Ans 40m.