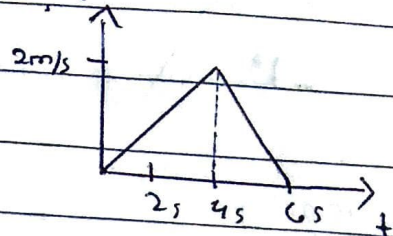


MOTION

Cont.

Home assignment:-

- 1) VT graph of a particle moving along a straight line as shown in figure. Which of the following is incorrect for 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 straight line. The velocity-time graph of two cars is shown in figure find the time (in sec) when car B will catch car A.

Distance covered by A

is calculated - $S_A = vt$
(v is given 10 m/s)

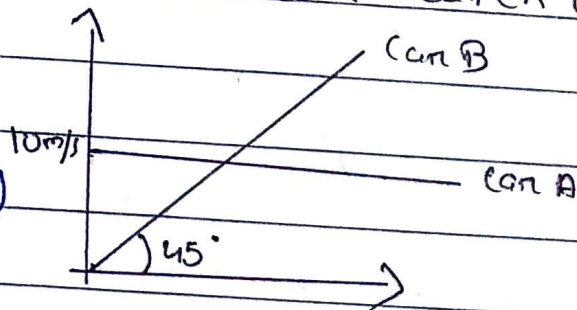
$$\text{For B} = S_B = \frac{1}{2} a t^2 =$$

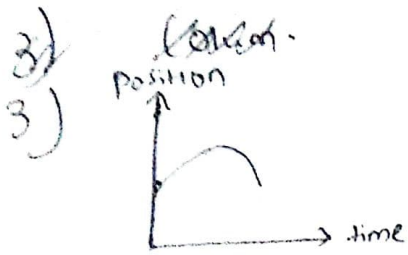
$$\frac{1}{2} t^2 \quad (a_{\text{car}} = \tan 45^\circ = 1)$$

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

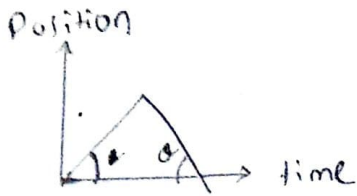
$$\Rightarrow t^2 - 20t - 21 \Rightarrow t = 20 \pm \sqrt{400 + 84}$$

$$\Rightarrow 21 \text{ sec}^2$$



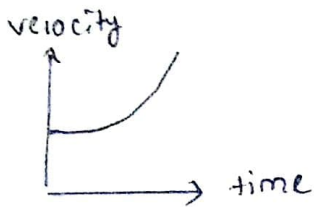


Particle moving with constant -ve acceleration

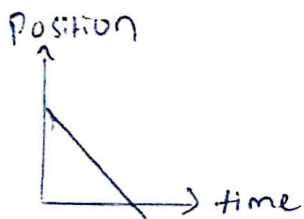


Particle moving with constant +ve acceleration

Particle moving with zero acceleration



Particle moving in increasing acceleration

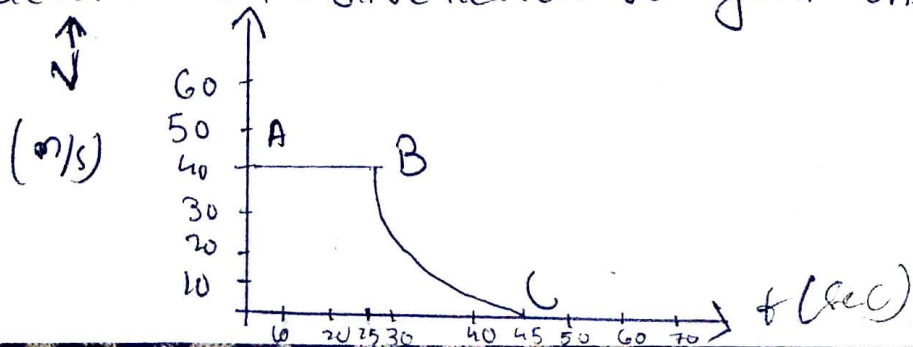


Particle moving with constant speed

Particle moving with constant negative acceleration

4) The v-t graph of an object is shown in figure.

- State the kind of motion object has, from A to B and from B to C
- Identify the part of graph where the object has zero acceleration. Give reason for your answer
- Identify the part of graph where the object has negative acceleration. Give reason for your answer.



a) uniform motion - from A-B

Non uniform motion - from B-C

b) From A-B object has acceleration = 0 as velocity is constant

c) From B-C object has negative acceleration because velocity decreases from B-C

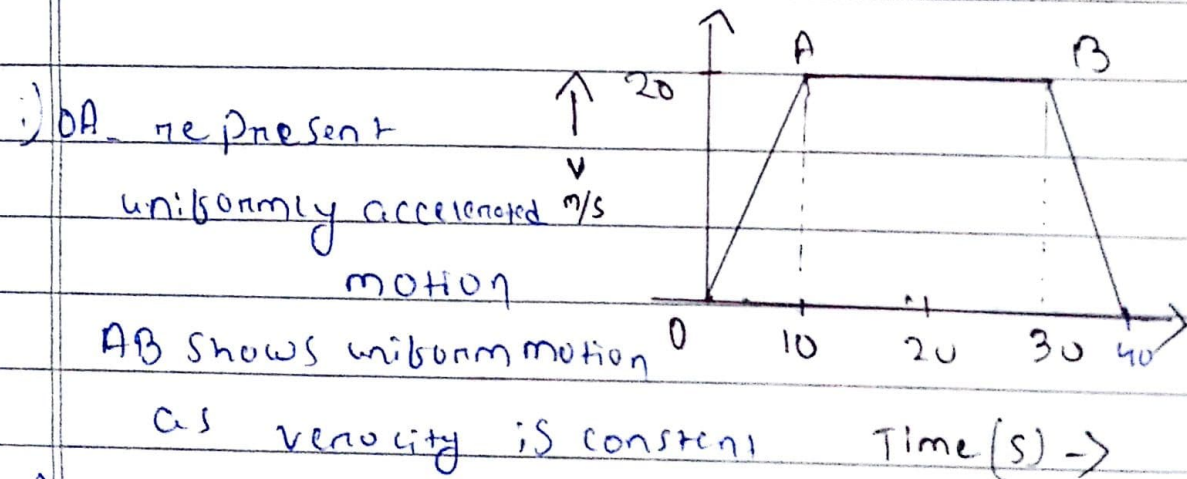
5) The V-t graph of a body is given:-

i) State the kind of motion represented by OA, AB.

ii) What is velocity of body at 10s & 40s

iii) Calculate negative acceleration of body.

iv) Calculate the distance covered by the body between 10th & 30th Second.



i) OA represent uniformly accelerated motion

AB shows uniform motion as velocity is constant

ii) At 10s $v = 20 \text{ m/s}$
At 40s $v = 0$

iii) Negative acceleration on retardation: $\frac{v-u}{t} = \frac{20-0}{10} = 2 \text{ m/s}^2$

iv) distance covered = area under vt graph in 10th & 30th second: $20 \times 20 = 400 \text{ m}^2$