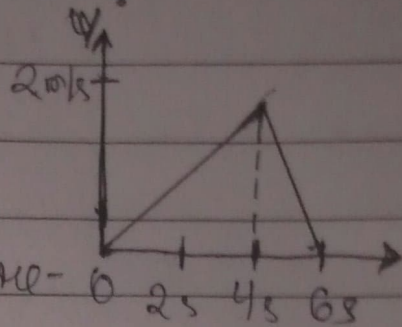


Home Assignment

1. The $v-t$ graph of a particle moving a straight line is as shown in fig. which of the following is/are incorrect for this motion?



✓(1) The motion is uniform

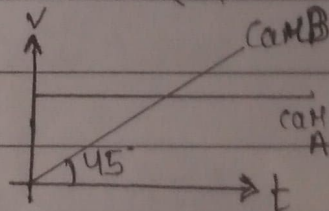
✓(2) The accⁿ is uniform

✓(3) The particle changes its direction of motion.

(4) The disp. during the period 0-4s is equal to the area under the $v-t$ graph for this period.

2. Initial car A is 100.5 m ahead of car B. Both start moving at time $t=0$ in the same direction along a straight line. The velocity $v-t$ graph of two cars is shown in fig.

Find the time (in sec) when the car B will catch the car A.



ans. The dist. travelled by A is calculated as $s_A = vt$

(velocity is given as 10 m/s)

and that of B is calculated as $s_B = \frac{1}{2} at^2 = \frac{1}{2} t^2$

As $a = \tan 45^\circ = 1$

Initially A is 10.5m ahead of B, thus we get

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

Thus we get the eqⁿ as

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

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

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

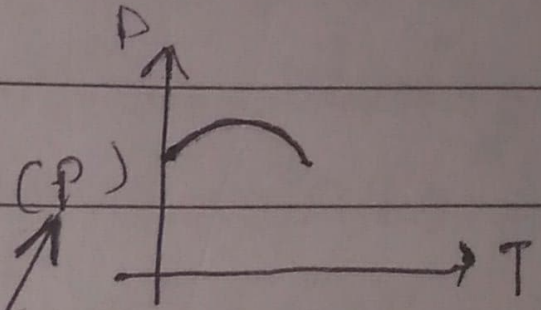
$$= \frac{20 + 22}{2}$$

$$= 21 \text{ sec.}$$

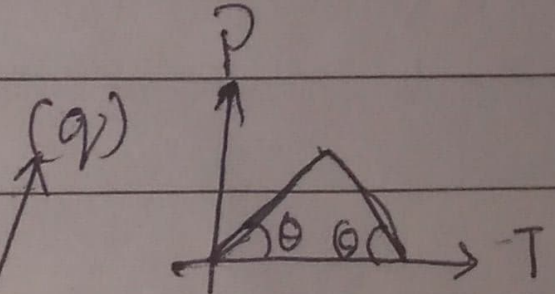
Column I

Column II

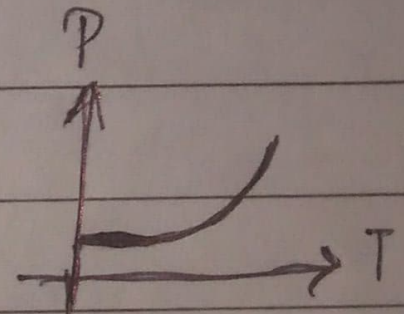
(a) Particle moving with const. speed.



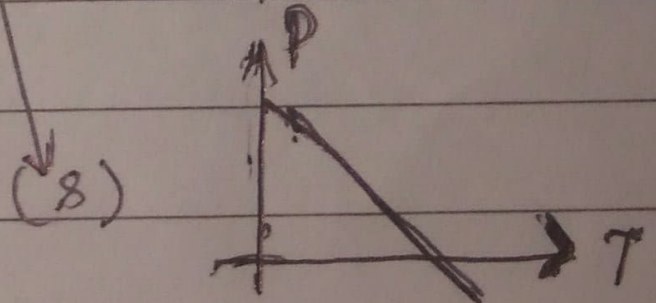
(b) Particle moving with increasing accⁿ.



(c) Particle moving with const. -ve accⁿ.



(d) Particle moving with accⁿ.



(p)

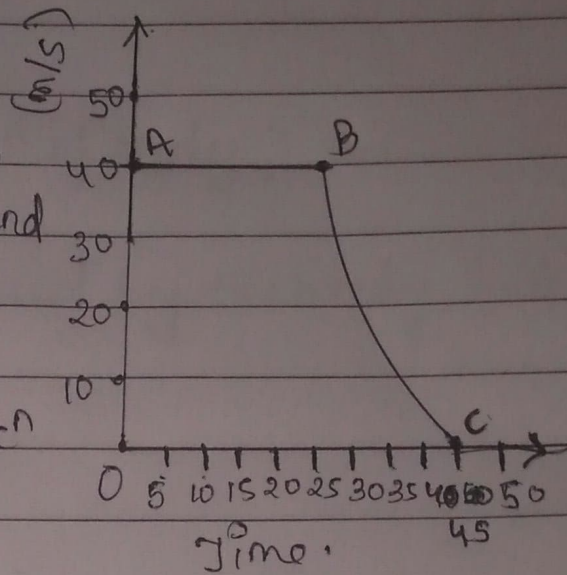
(q)

(r)

(s)

Home Assignment

4. The v-T graph of an object is shown in the following fig.



(a) state the kind of motion that object has from A-B and from B-C

(b) Identify the part of graph where the object has 0 accⁿ. Give reason for your answer.

(c) Identify the part of graph where object has negative accⁿ. Give reason.

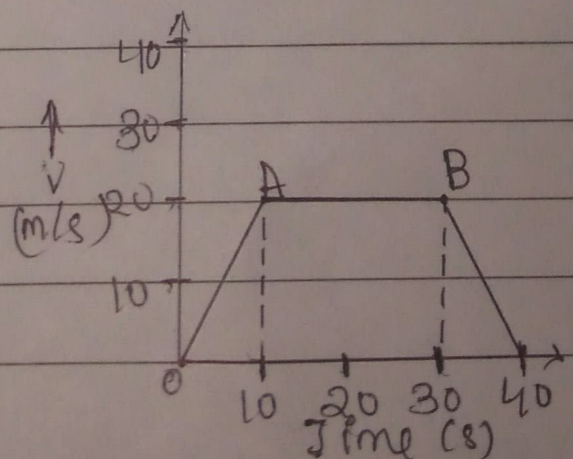
(a) ~~to~~ Uniform motion from A-B and non-uniform motion from B-C.

(b) AB because velocity remains constant from A-B.

(c) BC because velocity decreases from B-C

5. The v-T graph of a body is given:-

(i) state the kind of motion reported by OA, AB



(i) What is the velocity of body after 10s and after 40s?

(ii) Calculate ~~the~~ -ve accⁿ of body?

(iii) Calculate dist covered by the body betwe en 10th and 30th s?

Answer

(i) DA represent uniformly accelerated motion. AB shows uniform motion as velocity is const.

(ii) After 10s $v = 20 \text{ m/s}$

(iii) ~~the~~ -ve accⁿ or retardation = $\frac{v-u}{t} = \frac{20-0}{10} = 2 \text{ m/s}^2$

(iv) Dist. covered area under vt graph in 10th and 30th s. = $20 \times 20 = 400 \text{ m}^2$.