

HOME ASSIGNMENT

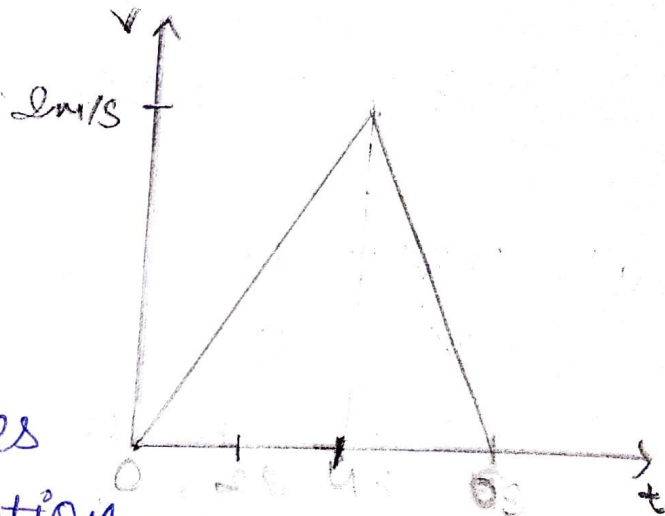
Q1 The velocity-time graph of a particle moving along a straight line is shown in figure. Which of the following ~~are~~ is/are INCORRECT for this motion?

(1) The motion is uniform

(2) The acceleration is uniform.

(3) The particle changes its direction of motion.

(4) The displacement during the period 0-4s is equal to the area under the velocity-time graph for this period.



Q3. Match the situation given in column I with the possible curves in column II.

column I

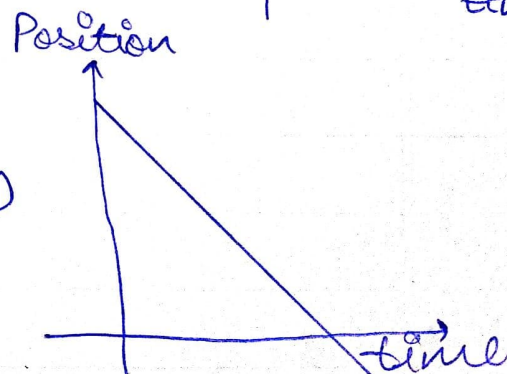
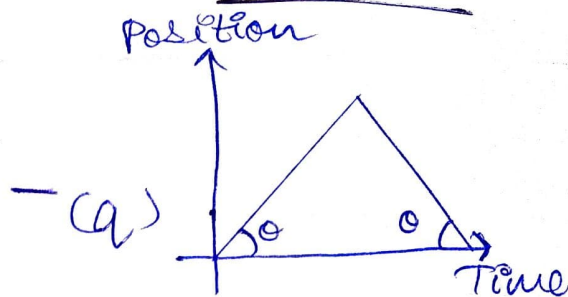
(A) Particle moving with constant speed.

(B) Particle moving with increasing acceleration.

(C) Particle moving with constant negative acceleration.

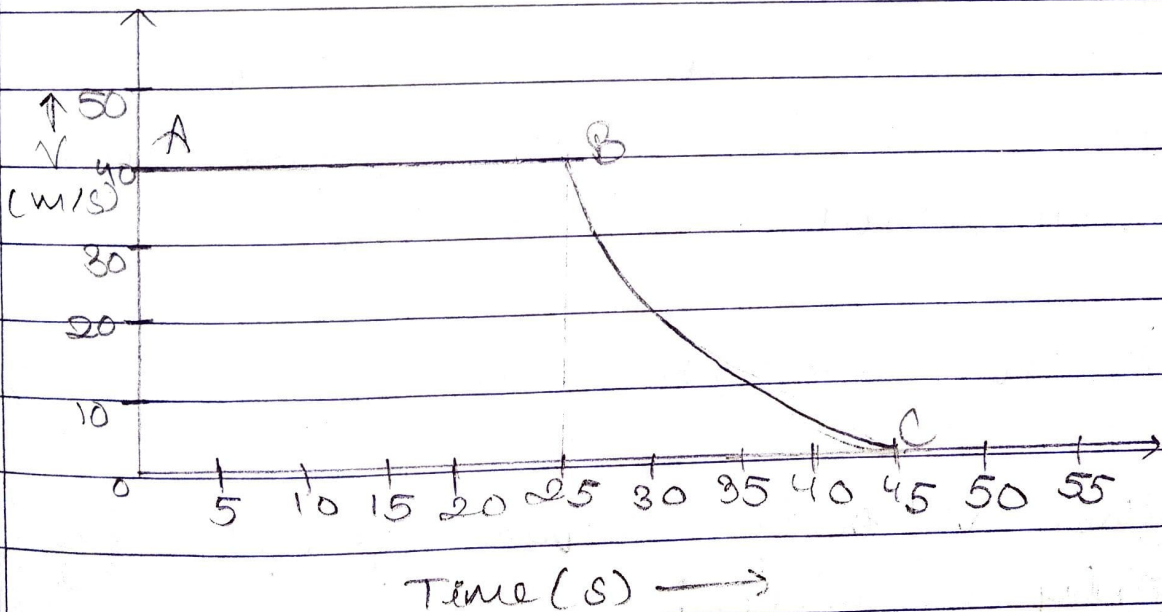
(D) Particle moving with zero acceleration.

column II



4. The velocity-time graph of an object is shown in the figure.

- (a) state the kind of motion that object has, from A to B and from B to C.
- (b) Identify the part of graph where the object has zero acceleration. Give reason for your answer.
- (c) Identify the part of graph where the object has negative acceleration. Give reason for your answer.



Sol:- (a) From A to B, ~~ab~~ the object has uniform motion.
From B to C, the object has non-uniform motion.

(b) The object has zero acceleration from A to B. The slope of a velocity-time graph gives the acceleration. In this graph the velocity is constant, ^{from A to B} so graph is a straight line parallel to the time axis. Therefore, the slope of the graph from A to B is 0. Hence, the acceleration of ~~the~~ the object is zero from A to B.

(c) The object has negative acceleration from B to C. The velocity of the body decreases from 40 m/s to 0 in time = $45 - 25 = 20$ seconds.

$$\therefore \text{acceleration} = \frac{0 - 40}{20} = \frac{-40}{20} = -2 \text{ m/s}^2$$

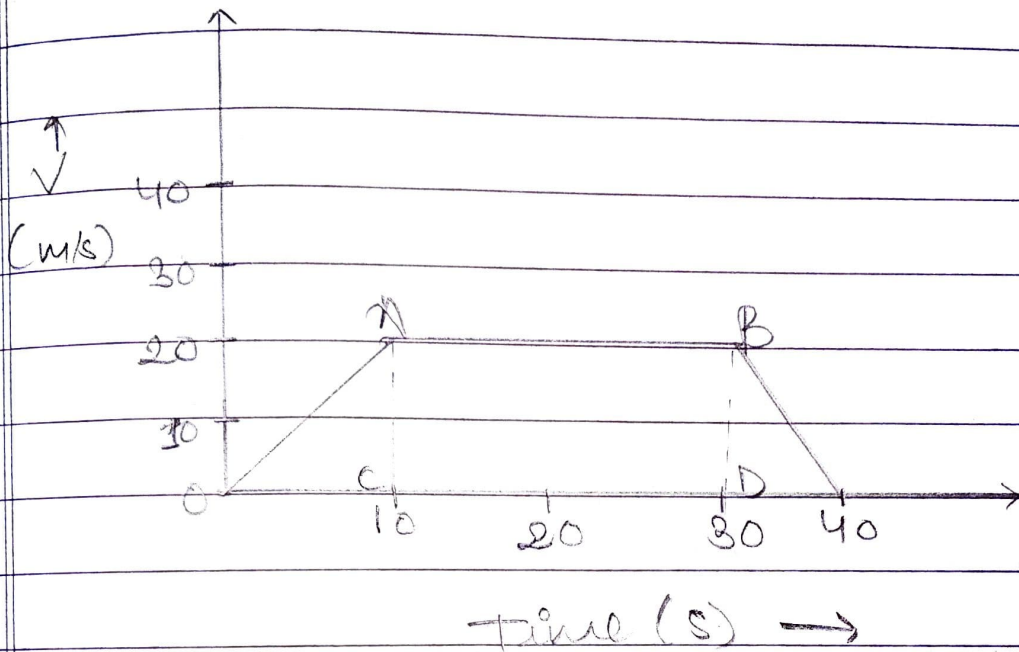
\therefore The acceleration is negative.

Q5. The velocity-time graph of a body is given:

- (i) State the kind of motion reported by OA, AB.
- (ii) What is the velocity of the body after 10s and after 40s?

(iii) calculate the negative acceleration of the body.

(iv) calculate the distance covered by the body between 10th and 30th second.



Sol: - d) OA has uniformly accelerated motion.

AB has uniform motion.

(ii) Velocity of the body after 10s is 20 m/s.

Velocity of the body after 40s is 0.

(iii)

$$v = 0 \text{ m/s}$$

$$u = 20 \text{ m/s}$$

$$t = 40 - 30 = 10 \text{ s}$$

$$\Rightarrow a = \frac{v - u}{t} = \frac{0 - 20}{10} = -2 \text{ m/s}^2$$

(iv) Distance covered by the body
between 10th and 30th second =
Area of ABCD
 $= 20 \times (80 + 10) = 20 \times 20 = 400 \text{ m}$