YAKEEN NEET 2.0

2026

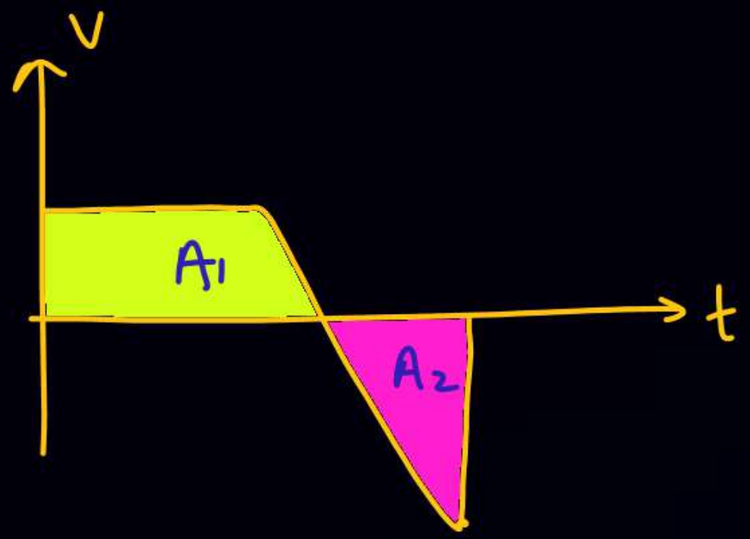
Kinematics

PHYSICS

(KPP 14

By - Saleem Ahmed Sir

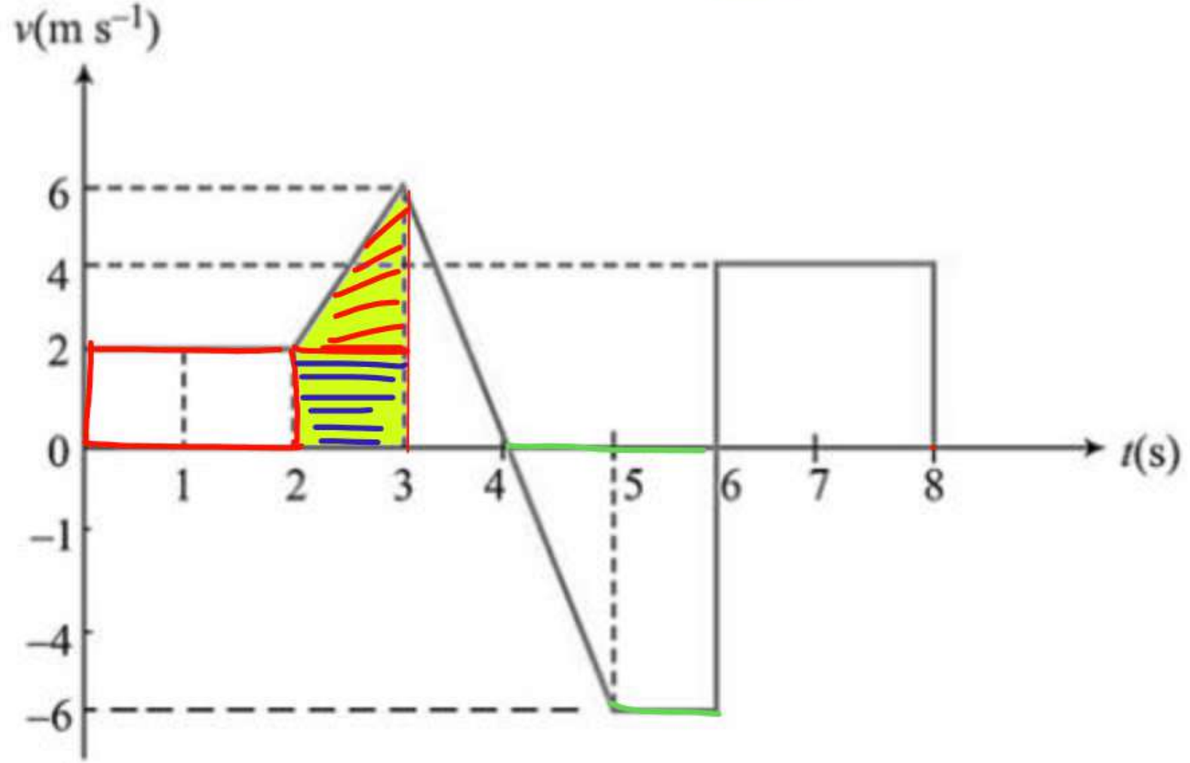
KPP Discussion


V
A1
A2
t

Question - 01

The velocity-time graph of a body is shown in figure.

The displacement of the body in 8 s is:



(1) 9 m

(2) 12 m

(3) 10 m

(4) 28 m

$4 + \frac{1}{2} \times 8 \times 1 + \frac{1}{2} \times 1 \times 6$

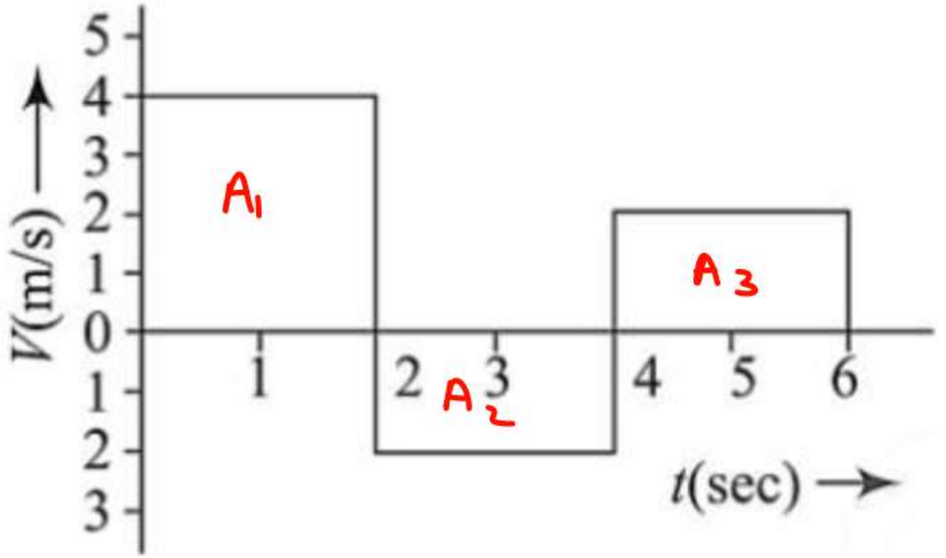
$- \frac{1}{2} \times 3 \times 6 + 2 \times 4$

$= 4 + 4 + 3 - 9 + 8$

Ans : (3)

Question - 02

The velocity-time graph of a body moving in a straight line is shown in the figure. The displacement and distance travelled by the body in 6 sec are respectively.

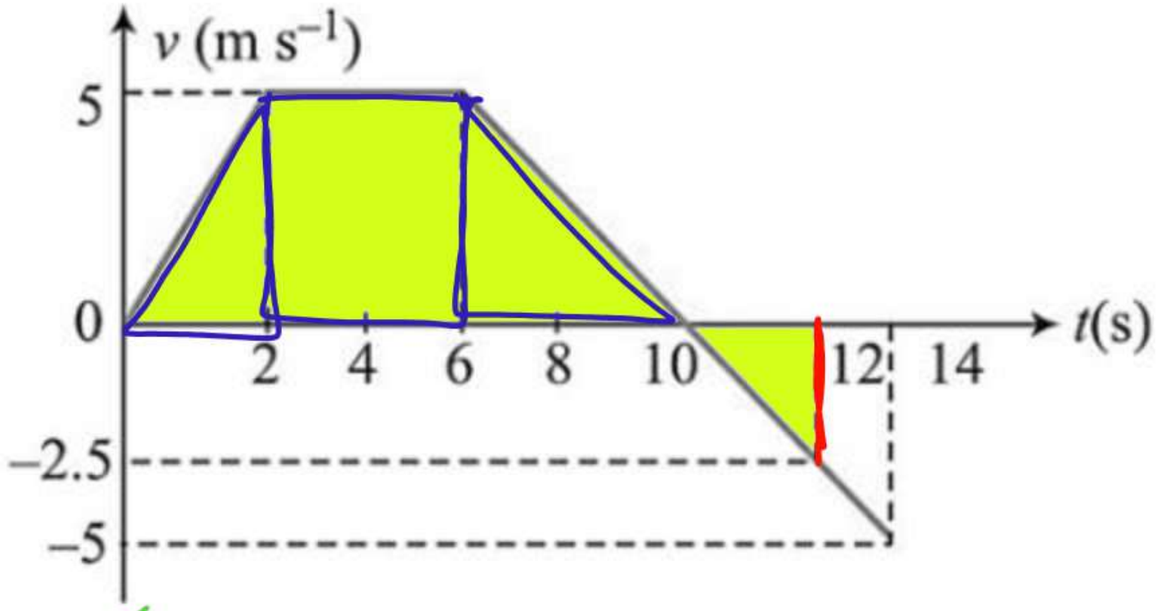


(1) 8 m, 16 m
(2) 16 m, 8 m
(3) 16 m, 16 m
(4) 8 m, 8 m

Ans : (1)

Question - 03

The variation of velocity of a particle moving along a straight line is shown in figure. The distance travelled by the particle in 12 s is:



(1) 37.5 m
(2) 32.5 m
(3) 35.0 m
(4) None of these

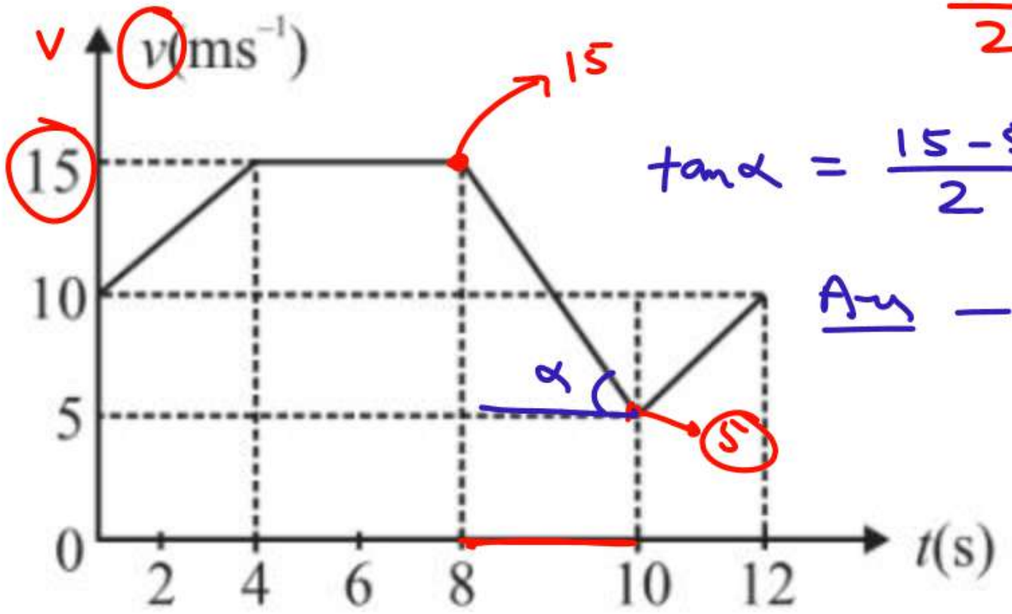
$\frac{1}{2} \times 14 \times 5 + \frac{1}{2} \times 2 \times \frac{5}{2}$

$= 35 + 2.5$

Ans : (1)

Question - 04

The velocity-time graph of a particle moving in a straight line is shown in figure. The acceleration of the particle at $t = 9$ s is:



$\frac{10}{2} = 5$

15

$\tan\alpha = \frac{15-5}{2} = 5$

Ans -5

(1) zero

(2) $5\ ms^{-2}$

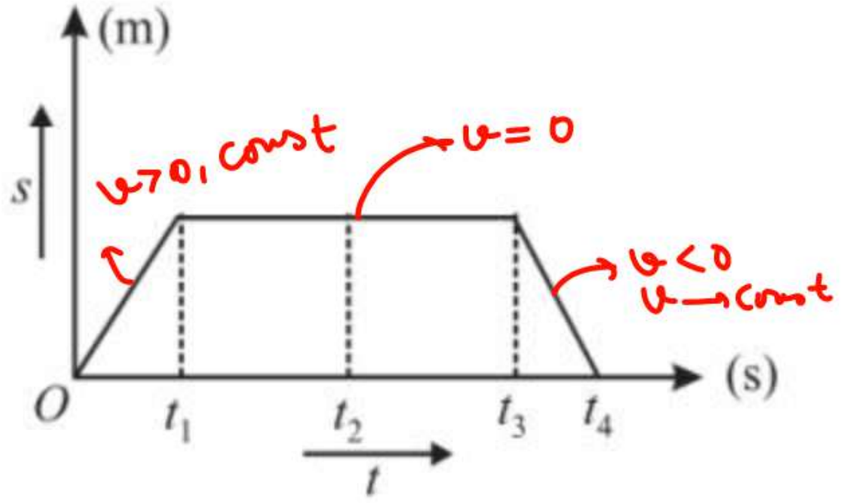
(3) $-5\ ms^{-2}$

(4) $-2\ ms^{-2}$

Ans : (3)

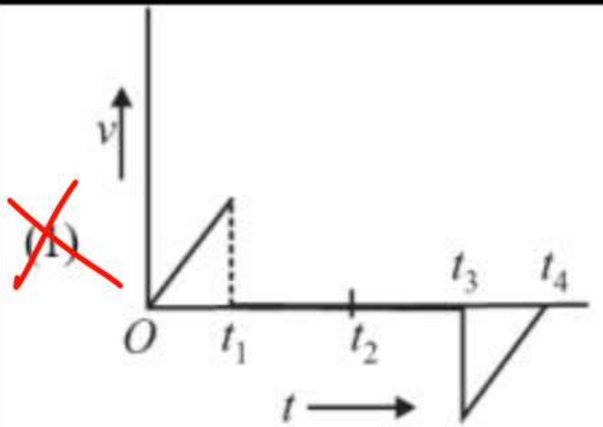
Question - 05

The displacement-time graph of a body is shown in figure.

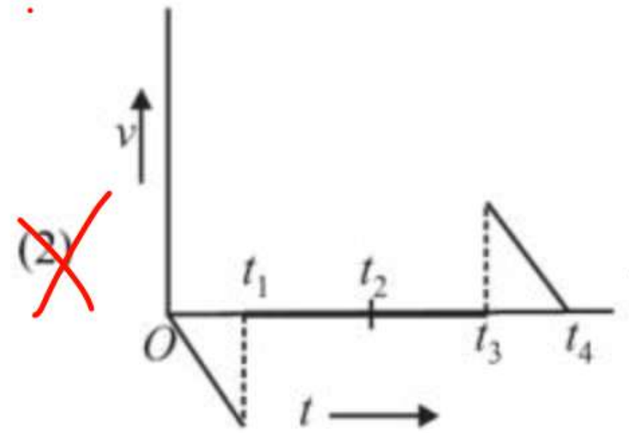


The velocity-time graph of the motion of the body will be:

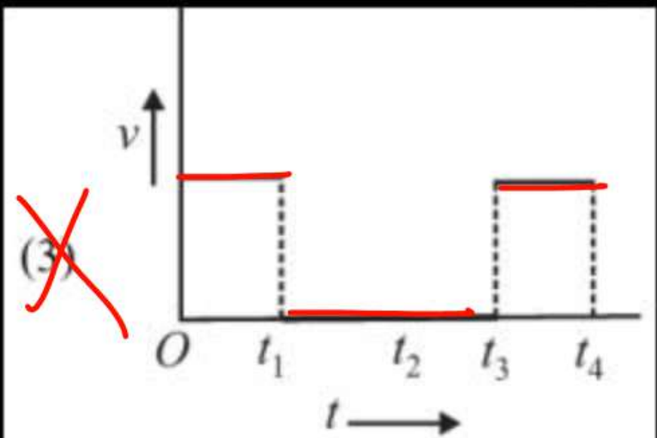
(1)



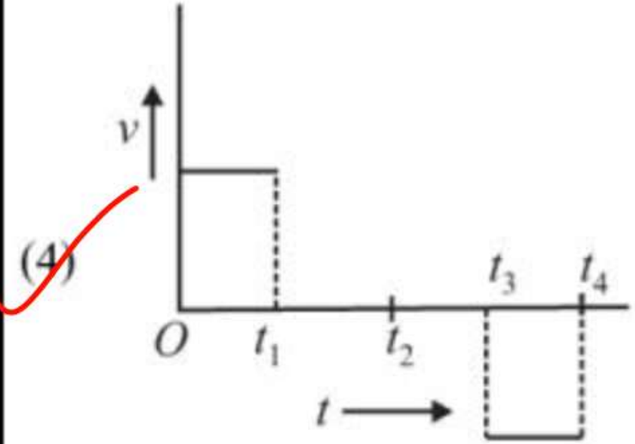
(2)



(3)



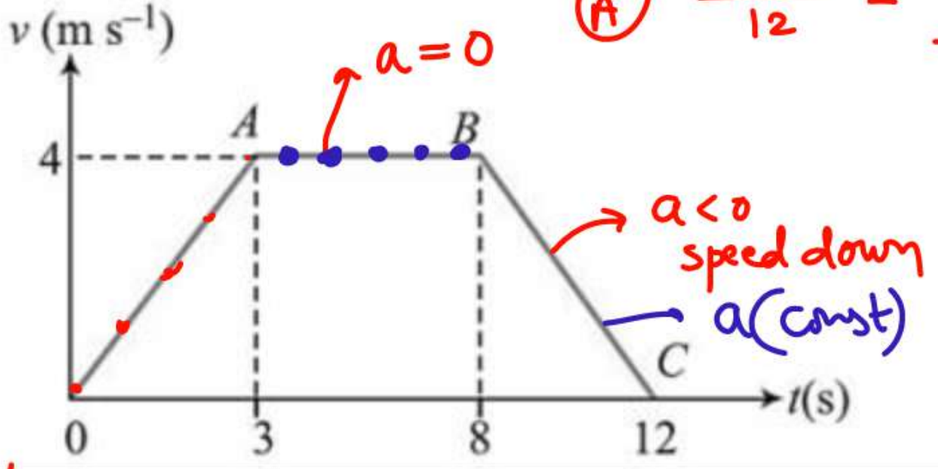
(4)



Ans : (4)

Question - 06

From the velocity-time graph, given in figure of a particle moving in a straight line, one can conclude that



(A) $\frac{\text{Area}}{12} = \frac{\frac{1}{2} \times 17 \times 4}{12} = \frac{34}{12}$

(1) Its average velocity during the 12 s interval is 24/7 ms^{-1}.

(2) Its velocity for the first 3 s is uniform and is equal to 4 ms^{-1}.

(3) The body has a constant acceleration between $t = 3$s and $t = 8$ s.

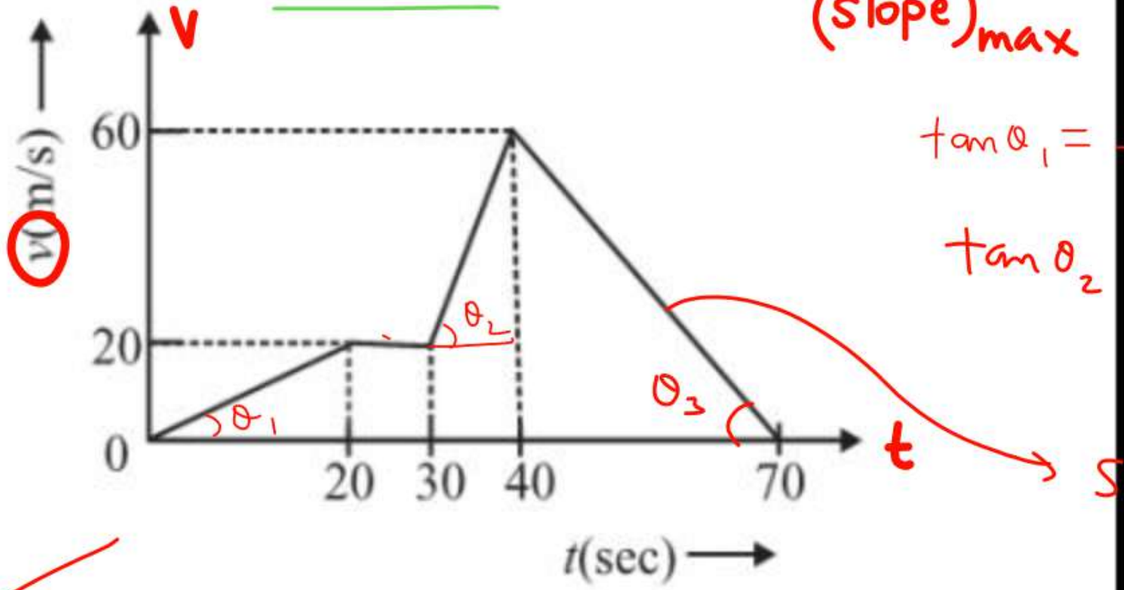
(4) The body has a uniform retardation from t = 8 s to $t = 12$ s.

(3,4)

Ans : (4)

Question - 07

The velocity-time graph of a body is given in figure. The maximum acceleration in m s^{-2} is:



(1) 4
(2) 3
(3) 2
(4) 1

$(slope)_{max}$

$\tan\theta_1 = 1$

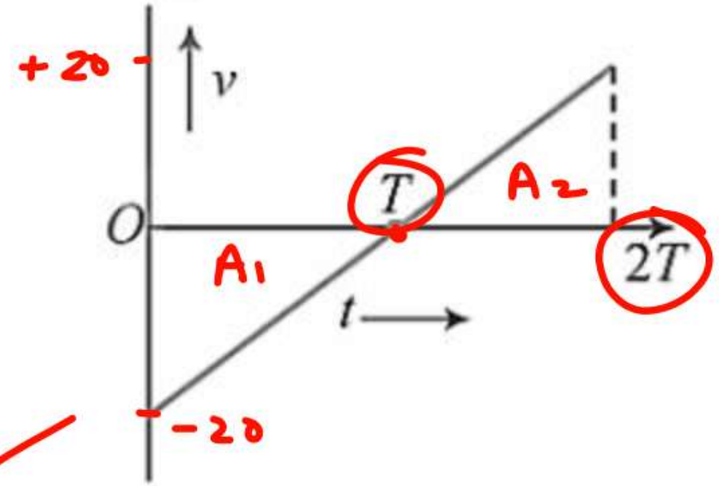
$\tan\theta_2 = \frac{40}{10} = 4$

$slope = -\frac{60}{30} = -2$

Ans : (1)

Question - 08

Figure shows the velocity (v) of a particle plotted against time (t).



(1) The particle changes its direction of motion at some point.

(2) The acceleration of the particle remains constant.

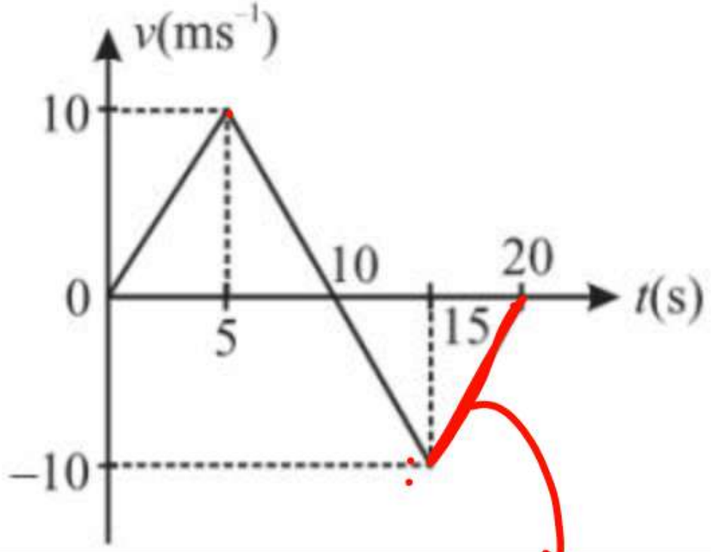
(3) The displacement of the particle is zero.

(4) The initial and final speeds of the particle are the same.

Ans : (1, 2, 3, 4)

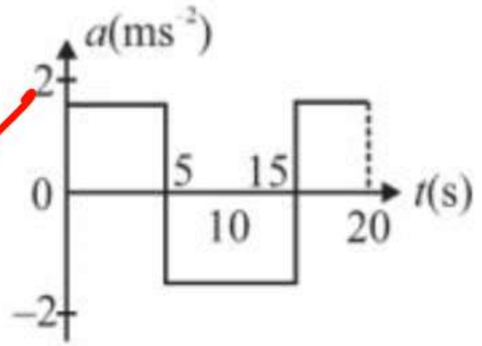
Question - 09

Plot the acceleration-time graph of the velocity-time graph given in figure.

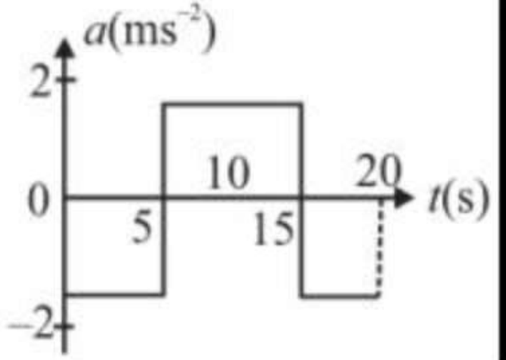


$a>0,\ a<0,\ a>0$

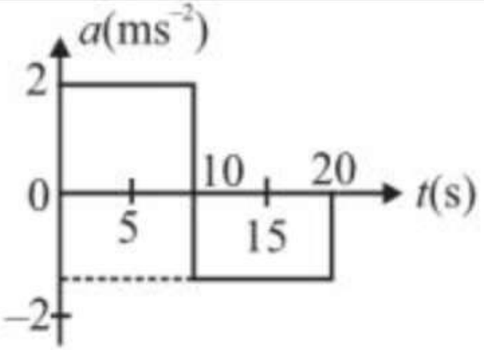
(1)



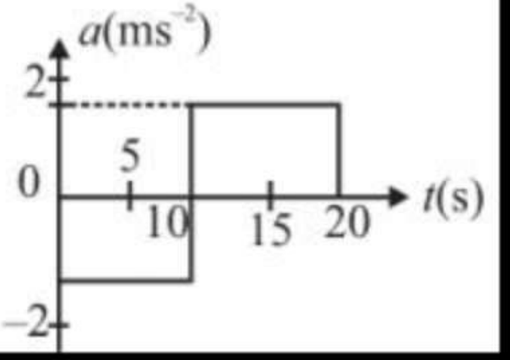
(2)



(3)



(4)



Ans : (1)

Question - 10

Average acceleration is in the direction of

(1) Initial velocity

(2) Final velocity

(3) Change in velocity

(4) Final velocity if initial velocity is zero.

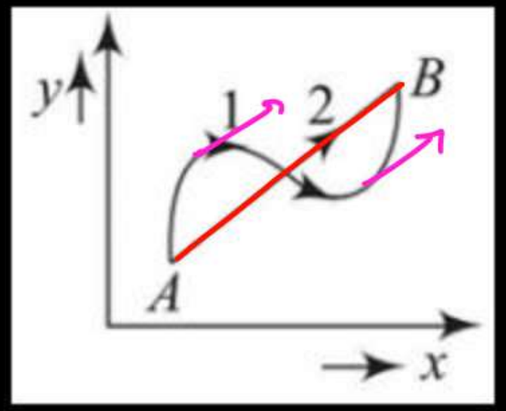
$$\langle \vec{a} \rangle = \frac{\vec{v}_f - \vec{v}_i}{\Delta t}$$

if $v_i = 0$, $\langle \vec{a} \rangle = \frac{\vec{v}_f - 0}{\Delta t}$

Ans : (3, 4)

Question - 11

A particle can travel from point A to B from two different paths 1 and 2, as shown, in same interval of time. Then which of the following is incorrect?



(1) Average velocity along the two paths must be equal

(2) The particle may travel along both the paths unaccelerated

(3) The direction of instantaneous velocity along the path 1 and 2 can be same for a maximum of two point on the paths.

(4) The average and instantaneous velocity along path 1 can have same direction.

Ans 2

① ②

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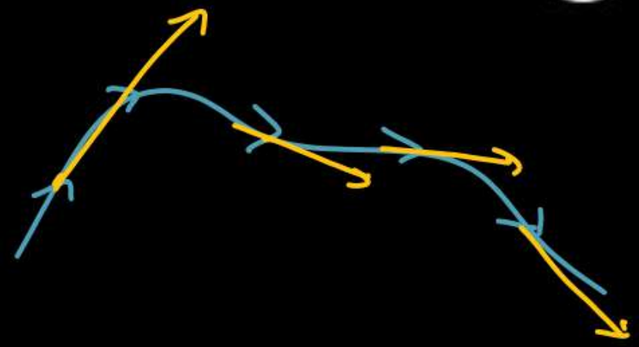
Displ. Same Same



2

Ans : ~~(1, 3, 4)~~

Question - 12

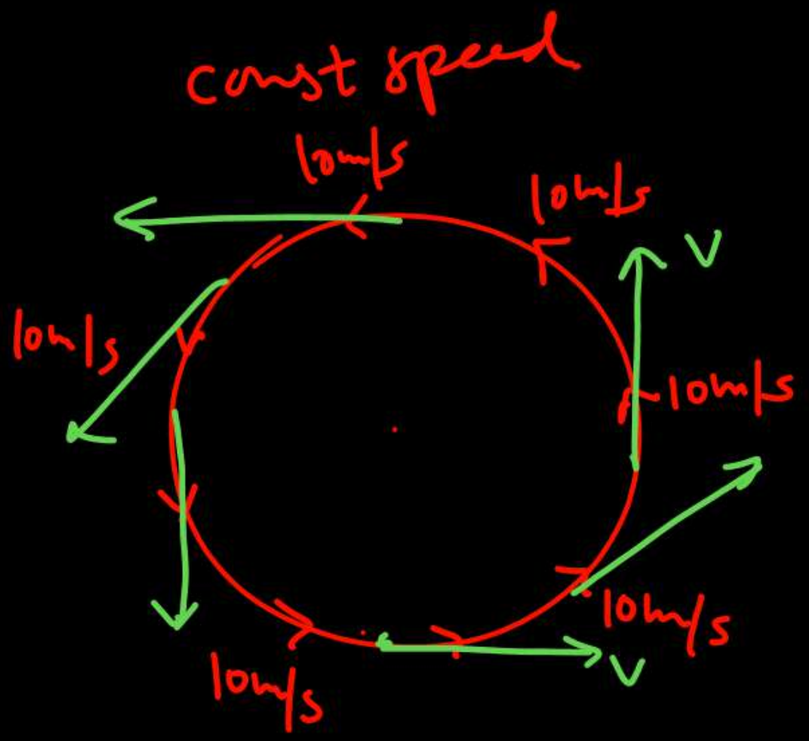
Which of the following statements is/are correct?

(1) If the velocity of a body changes, it must have some acceleration.

(2) If the speed of a body changes, it must have some acceleration.

(3) If the body has acceleration, its speed must change.

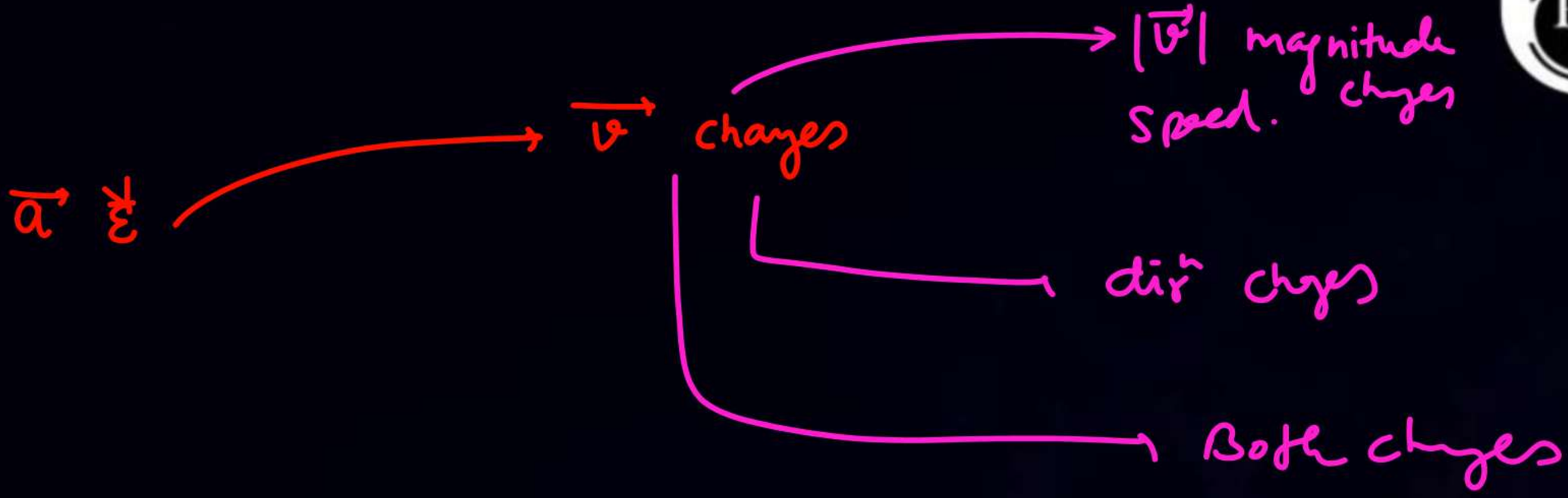
(4) If the body has acceleration, its speed may change.

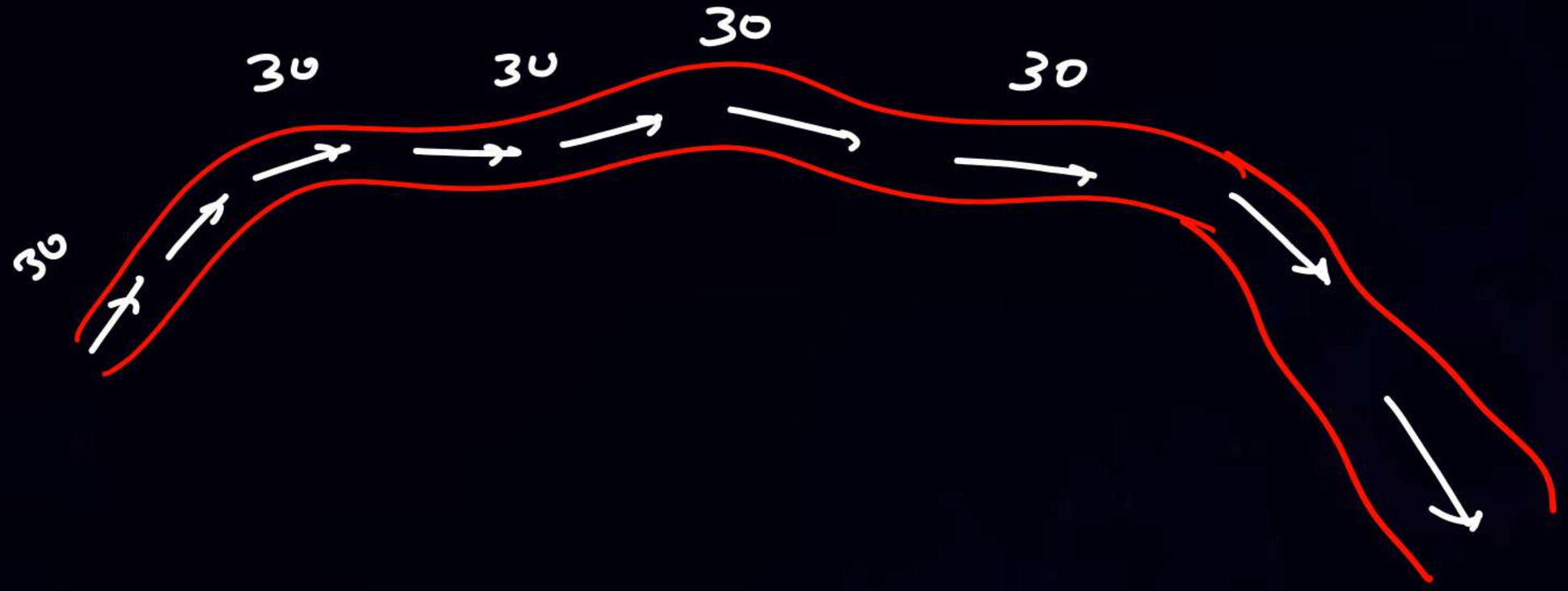


Dir^{n} of velocity → change

Velocity

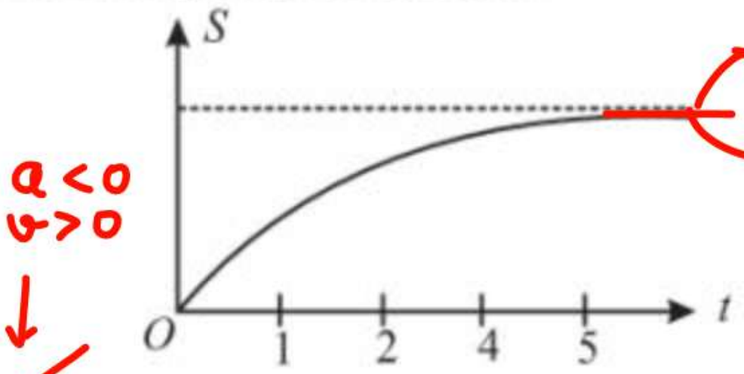
Ans : (1, 2, 4)


$\vec{a}$ ≠
$\vec{v}$ changes
$|\vec{v}|$ magnitude changes
Speed.
dir^{n} changes
Both changes


30
30
30
30
30

Question - 13

The displacement of a particle as a function of time is shown in figure. It indicates



(1) The particle starts with a certain velocity, but the motion is retarded and finally the particle stops.

(2) The velocity of the particle decreases.

(3) The acceleration of the particle is in opposite direction to the velocity.

(4) The particle starts with a constant velocity, the motion is accelerated and finally the particle moves with another constant velocity.

Ans : (1)

Question - 14

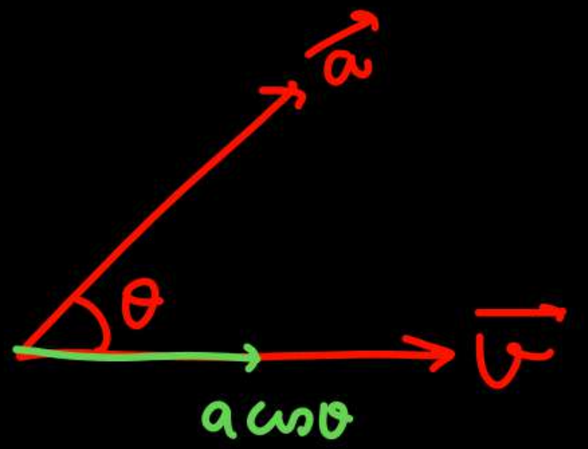
The body will speed up if

(1) Velocity and acceleration are in the same direction.

(2) Velocity and acceleration are in opposite directions.

(3) Velocity and acceleration are in perpendicular direction.

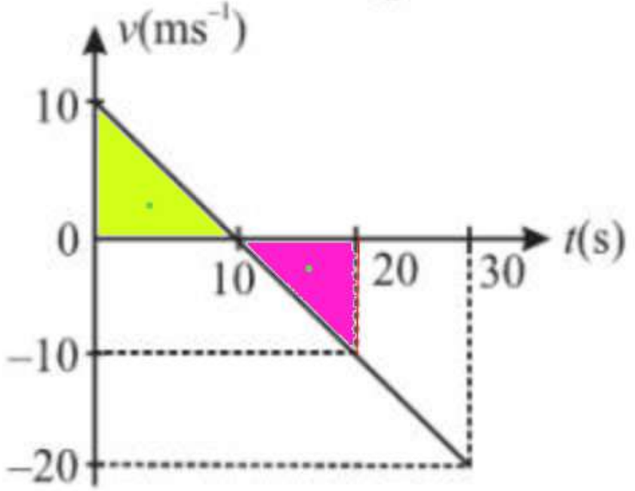
(4) Velocity and acceleration are acting at acute angle w.r.t. each other.



Ans : (1, 4)

Question - 15

The velocity-time plot for a particle moving on a straight line is shown in figure.



(1) The particle has a constant acceleration.

(2) The particle has never turned around.

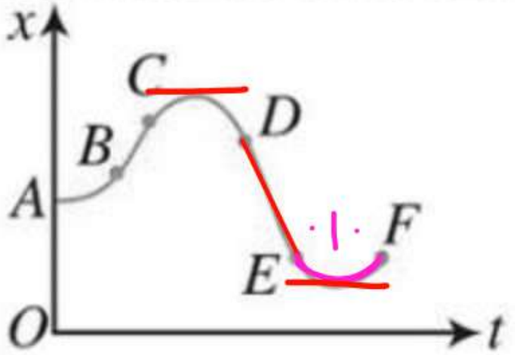
(3) The particle has zero displacement.

(4) The average speed in the interval 0 to 10 s is the same as the average speed in the interval 10 s to 20 s.

Ans : (1, 4)

Question - 16

For a particle moving along the x-axis, x-t graph is as given in figure. Mark the correct statement(s).



(1) Initial velocity of the particle is zero

(2) For BC acceleration is positive and for DE acceleration is negative

(3) For EF, the acceleration is positive

(4) Velocity becomes zero three times in the motion including $t=0$.

Ans : (1, 3, 4)

Question - 17

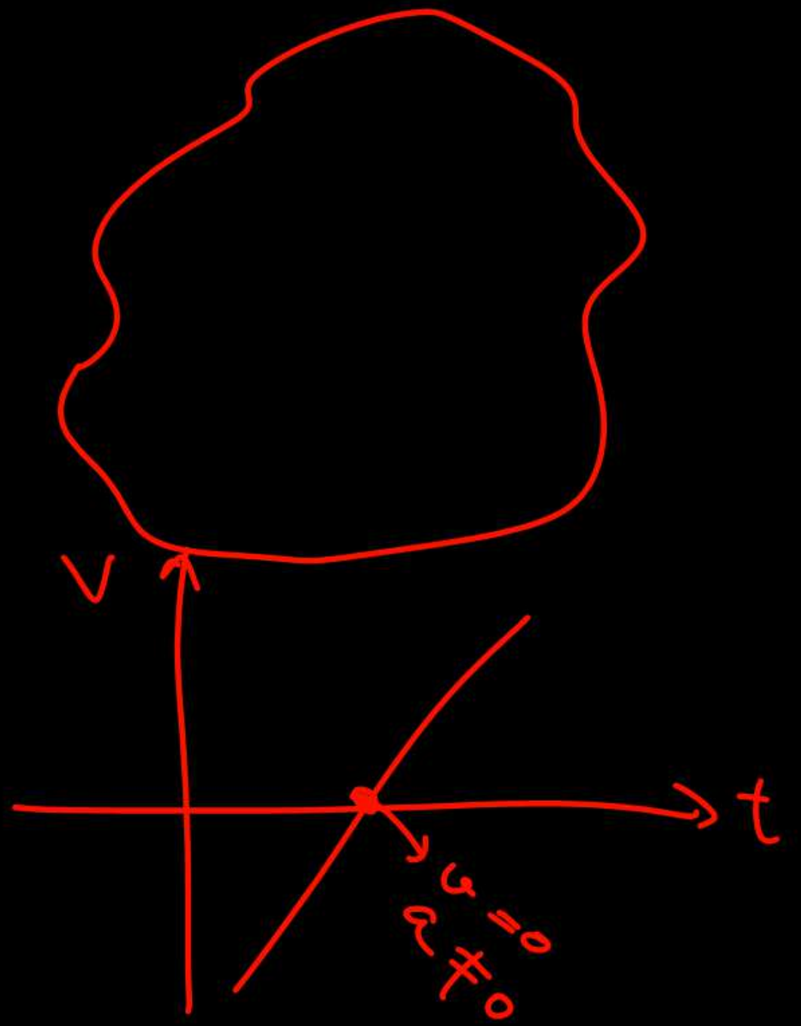
Mark the correct statement(s).

(1) A particle can have zero displacement and non-zero average velocity.

(2) A particle can have zero displacement and non-zero velocity.

(3) A particle can have zero acceleration and non-zero velocity.

(4) A particle can have zero velocity and non-zero acceleration.



Ans : (2, 3, 4)

Question - 18

The velocity-time graph of a body moving along a straight line is given below. Find:

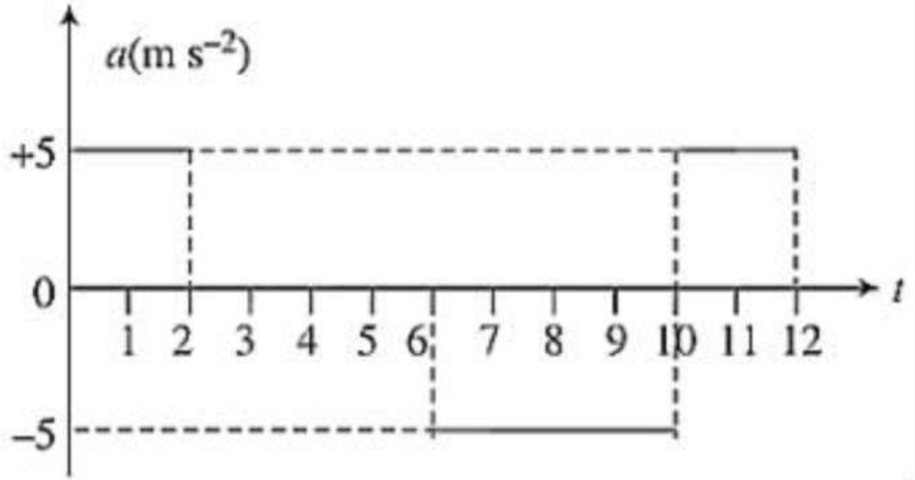
(a) Average velocity in whole time of motion

(b) Average speed in whole time of motion

(c) Draw acceleration vs time graph

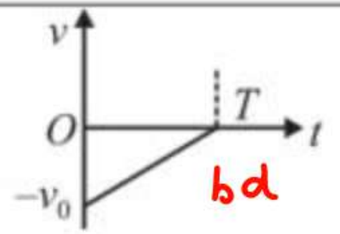
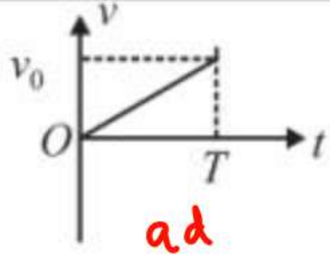
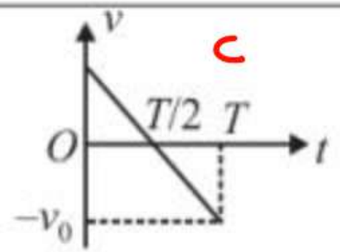
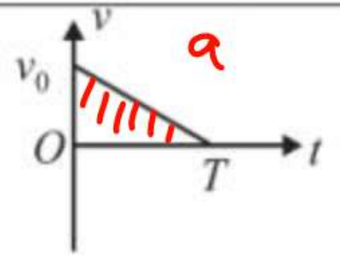
Ans : (a) 3.33 ms^{-1}, (b) 6.67 ms^{-1},

(c) Acceleration:



Question - 19

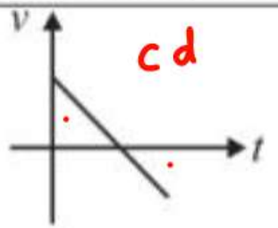
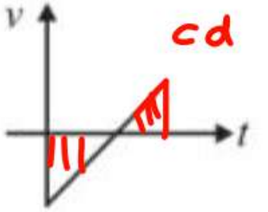
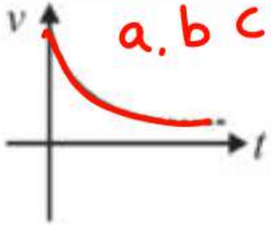
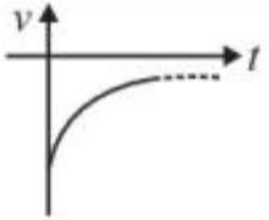
Study the following $v-t$ graphs in Column I carefully and match appropriately with the statements given in Column II. Assume that motion takes place from time 0 to T.

Column-I		Column-II	
i.	 bd	a.	Net displacement is positive, but not zero
ii.	 ad	b.	Net displacement is negative, but not zero
iii.	 c	c.	Particle returns to its initial position again Displacement = 0
iv.	 a	d.	Acceleration is positive

Ans: i → b,d; ii → a,d; iii → c; iv → a

Question - 20

The velocity-time graph for a particle moving along a straight line is given in each situation of column I. In the time interval $v > t > 0$, match the graph in column I with corresponding statements in column II.

Column-I		Column-II	
i.		a.	Speed of particle is continuously decreasing
ii.		b.	Magnitude of acceleration of particle is decreasing with time
iii.		c.	Direction of acceleration of particle does not change
iv.		d.	Magnitude of acceleration of particle does not change
		e.	Particle will never come back to its initial position

Ans: i → c,d; ii → c,d; iii → a,b,c,e; iv → a,b,c,e

Thank You