YAKEEN NEET 2.0

2026

Motion in a Straight Line

Physics | Assignment Solution 02

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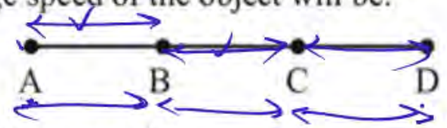
1. A horse rider covers half the distance with 5 m/s speed. The remaining part of the distance was travelled with speed 10 m/s for half the time and with speed 15 m/s for other half of the time. The mean speed of the rider averaged over the whole time of motion is $x/7$ m/s. The value of x is _____.

(1) 250 (2) 125

(3) 50 (4) 5

2. An object moves with speed v_1, v_2 and v_3 along a line segment AB, BC and CD respectively as shown in figure. Where AB = BC and AD = 3 AB, then average speed of the object will be:



(1) $\frac{(v_1+v_2+v_3)}{3}$

(2) $\frac{v_1v_2v_3}{3(v_1v_2+v_2v_3+v_3v_1)}$

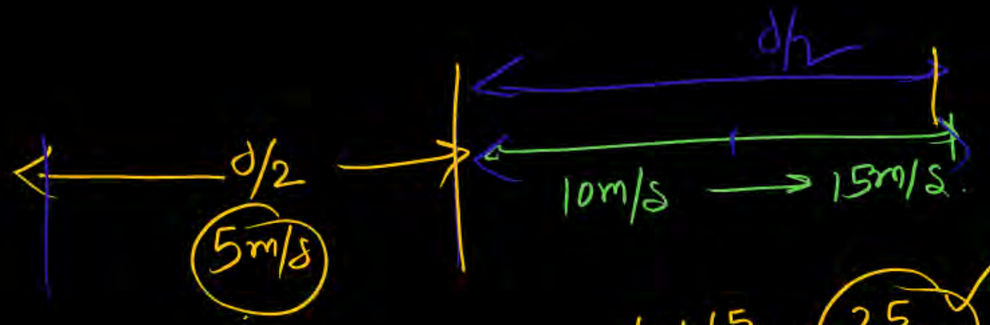
(3) $\frac{3v_1v_2v_3}{v_1v_2+v_2v_3+v_3v_1}$

(4) $\frac{(v_1+v_2+v_3)}{3v_1v_2v_3}$

4.

5.

6.

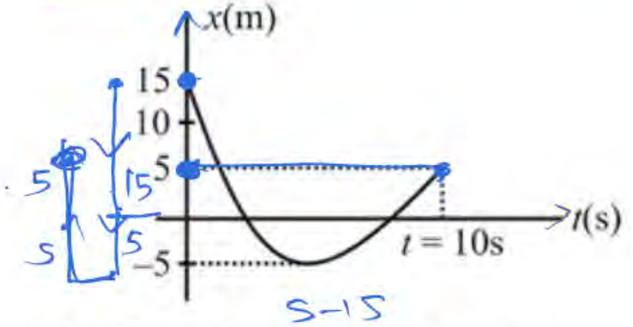


$\frac{10+15}{2} = \frac{25}{2}$

$\frac{2 \times 5 \times \frac{25}{2}}{5+\frac{25}{2}} = \frac{\frac{10 \times 25}{2}}{\frac{35}{2}}$

$= \frac{3}{\frac{1}{v_1}+\frac{1}{v_2}+\frac{1}{v_3}}$

3. Find distance, displacement, average speed and velocity in 10 sec .



(1) 20m, −10m, 3 m/s, −1 m/s

(2) 30m, 10m, 3 m/s, −1 m/s

(3) 20m, −10m, 1 m/s, −1 m/s

(4) 30m, −10m, 3 m/s, −1 m/s

4. A car travels a distance of 'x' with speed v_1 and then same distance 'x' with speed v_2 in the same direction. The average speed of the car is:

(1) $\frac{v_1 v_2}{2(v_1 + v_2)}$ (2) $\frac{v_1 + v_2}{2}$

(3) $\frac{2x}{v_1 + v_2}$ (4) $\frac{2v_1 v_2}{v_1 + v_2}$

5. A vehicle travels 4 km with speed of 3 km/h and another 4 km with speed of 5 km/h, then its average speed is:

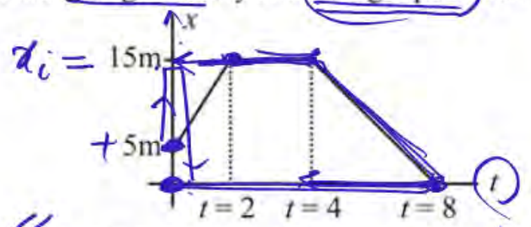
(1) 4.25 km/h

(2) 3.50 km/h

(3) 4.00 km/h

(4) 3.75 km/h

6. Find average velocity and average speed from:



(i) $t_1 = 2s$ to $t_2 = 8s$

(1) –2.5 m/s (2) 2.5 m/s

(3) –1.5 m/s (4) –5.0 m/s

(ii) $t_1 = 4s$ to $t_2 = 8s$

(1) 3.75 m/s (2) 1.25 m/s

(3) 2.5 m/s (4) 4.5 m/s

(iii) In 4 sec

(1) 1.25 m/s (2) 2.5 m/s

(3) 3.75 m/s (4) 5.0 m/s

(iv) In 8 sec

(1) 2.5 m/s (2) 4.0 m/s

(3) 3.125 m/s (4) 1.25 m/s

7. The distance travelled by an object in time t is given by $s = (2.5)t^2$. The instantaneous speed of the object at $t = 5$ s will be:

(1) 12.5 ms^{-1} (2) 62.5 ms^{-1}

(3) 5 ms^{-1} (4) 25 ms^{-1}

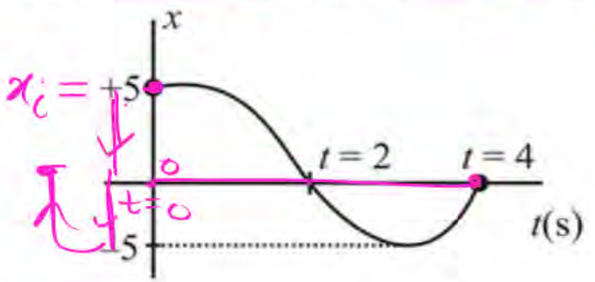
8. The position of a particle related to time is given by $x = (5t^2 - 4t + 5)$m. The magnitude of velocity of the particle at $t = 2$s will be:

(1) 10 ms^{-1} (2) 14 ms^{-1}

(3) 16 ms^{-1} (4) 06 ms^{-1}

$V = 10t - 4 + 0$

9. Find average velocity and speed in 4 sec.



(1) $\frac{5}{4}$ m/s, $\frac{15}{4}$ m/s (2) $\frac{5}{4}$ m/s, $\frac{10}{4}$ m/s

(3) $\frac{10}{4}$ m/s, $\frac{10}{4}$ m/s (4) $-\frac{5}{4}$ m/s, $\frac{15}{4}$ m/s

12.

13.

14.

$s = 2.5t^2$

$\frac{ds}{dt} = \frac{5}{2} \times 2t$

$= 5t$

10. The distance travelled by a particle is related to time t as $x = 4t^2$. The velocity of the particle at $t = 5$s is.

(1) 40 ms^{-1} (2) 25 ms^{-1}

(3) 20 ms^{-1} (4) 8 ms^{-1}

$x = 4t^2$

$= 4(2t)$

$= 8t$

10. The distance travelled by a particle is related to time t as $x = 4t^2$. The velocity of the particle at $t = 5$s is.

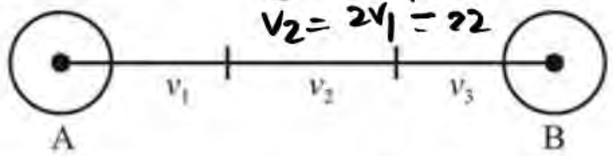
(1) 40 ms^{-1} (2) 25 ms^{-1}

(3) 20 ms^{-1} (4) 8 ms^{-1}

11. A car covers AB distance with first one-third at velocity v_1, ms^{-1}, second one-third at v_2, ms^{-1} and last one-third at v_3, ms^{-1}. If $v_3 = 3v_1$, $v_2 = 2v_1$ and $v_1 = 11$ ms^{-1} then the average velocity of the car is _____ ms^{-1}.

$V_3 = 3V_1 = 33$ $V_1 = 11$ m/s

$V_2 = 2V_1 = 22$

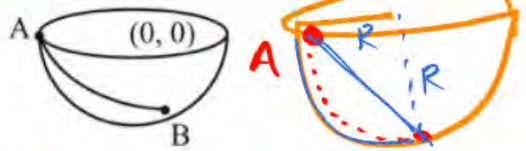


(1) 11 m/s (2) 18 m/s

(3) 13 m/s (4) 12 m/s

$$Av_{SH} = \frac{3}{\frac{1}{11} + \frac{1}{22} + \frac{1}{33}}$$

12. Ball is released from A on smooth horizontal hemi sphere of radius R then find distance and displacement from A to B



(1) $\frac{\pi R}{2}, R\sqrt{2}$ (2) R, R

(3) $\pi R, 2R$ (4) $\pi R, R$

13. The position co-ordinates of a particle moving in a 3-D coordinates system is given by

$x = a\sin(\omega t)$, $y = a\sin(\omega t)$ and $z = a\omega t$

The speed of the particle is:

(1) $\sqrt{2}a\omega$ (2) $a\omega$

(3) $\sqrt{3}a\omega$ (4) $2a\omega$

Printing mistake

$\frac{dx}{dt} = v_x = \omega a\cos(\omega t)$

$v_y = -\omega a\sin(\omega t)$

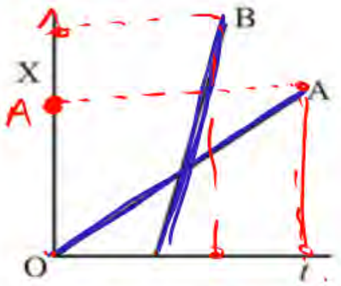
$v_z = a\omega$

$|\vec{v}| = \sqrt{[\omega a\cos(\omega t)]^2 + (-\omega a\sin\omega t)^2 + (a\omega)^2}$

$= \sqrt{\omega^2 a^2(\cos^2(\omega t) + \sin^2(\omega t)) + (a\omega)^2}$

$= \omega a\sqrt{2}$

14. The position-time graphs for two students A and B returning from the school to their homes are shown in figure:



(A) A lives closer to the school

(B) B lives closer to the school

(C) A takes lesser time to reach home

(D) A travels faster than B

(E) B travels faster than A

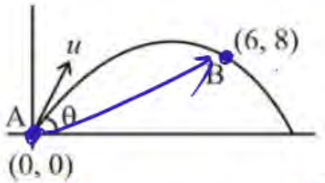
(1) (A) and (E) only

(2) (B) and (E) only

(3) (A), (C) and (E) only

(4) (A), (C) and (D) only

15. Ball is projected then find displacement from A to B.



(1) $6\hat{i}+8\hat{j}$ (2) $-6\hat{i}-8\hat{j}$

(3) $6\hat{i}-8\hat{j}$ (4) 10 m

16. A particle moving in a straight line covers half the distance with speed v_0. The other half of the distance is covered in two equal time intervals with speed v_1 and v_2, respectively. The average speed of the particle during this motion is

(1) $\frac{v_0(v_1+v_2)}{v_0+v_1+v_2}$ (2) $\frac{2v_0(v_1+v_2)}{v_0+v_1+v_2}$

(3) $\frac{2v_0(v_1+v_2)}{2v_0+v_1+v_2}$ (4) $\frac{v_0(v_1+v_2)}{2v_0+v_1+v_2}$

17. Which of the following option is correct:

(1) Velocity of object increasing and acceleration may decreasing.

(2) Velocity of object decreasing and acceleration may increasing.

(3) Acceleration may be non-zero when velocity of object is zero.

(4) All of these.

19.

20.

21.

22.

$V = \frac{V_1+V_2}{2}$

$= \frac{2V_0\left(\frac{V_1+V_2}{2}\right)}{V_0+\left(\frac{V_1+V_2}{2}\right)}$

If $V_1=V_2=V_3=1$ m/s

$= \frac{2\times1\,(2)}{2+1+1} = \frac{4}{4} = 1$

+Q (2) → F → a↓

(4) All of these.

18. **Statement-I:** If acceleration of particle is increasing, it's velocity must increases.

Statement-II: The rate of change of speed with respect to time will provide us Net acceleration.

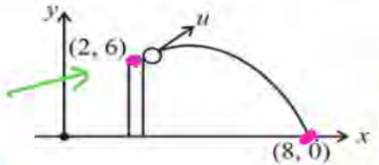
(1) Both statements false

(2) Both statements true

(3) Statement-I is false and Statement-II is true

(4) Statement-I is true and Statement-II is false

19. Object is projected from pole and reach at ground as shown in figure, then find displacement:



$8\hat{i}+0\hat{j}-(2\hat{i}+6\hat{j})$

$6\hat{i}-6\hat{j}$

(1) $6\hat{i}-6\hat{j}$ m (2) $-6\hat{i}-6\hat{j}$ m

(3) $6\hat{i}+6\hat{j}$ m (4) $6\sqrt{2}$ m

20. Object is moving such that its velocity and acceleration is in opposite direction then

(1) Speed may constant.

(2) Speed may increasing.

(3) Speed must be decreasing.

(4) Speed may be increasing or decreasing.

21. An object is moving with constant velocity then which of the following option is correct

(1) Acceleration may be increasing.

(2) Acceleration is zero.

(3) Acceleration is decreasing.

(4) Acceleration is non-zero.

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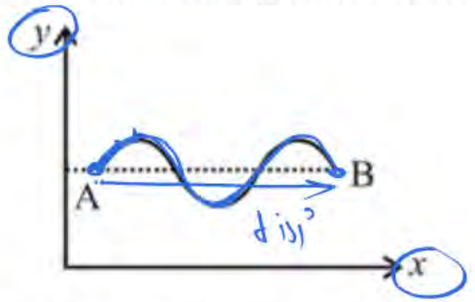
22. A graph between x-y coordinates is given for a particle moving in x-y plane from point A to point B. Which of the following option is CORRECT:



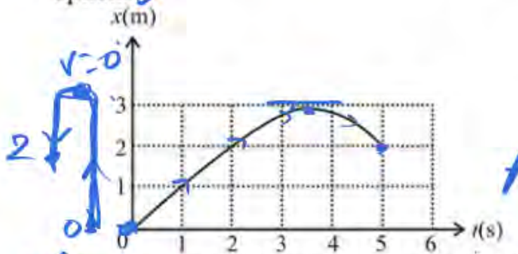
(1) This graph represents path of the particle.

(2) Particle does not change it's direction during the motion.

(3) Average velocity from A to B is zero.

(4) Particle travels in a straight line.

23. A particle moved along the x-axis according to the graph shown in Figure. Choose the incorrect options.



(1) The particle did not move in straight line from $t = 0$s to $t = 5$s.

(2) The magnitude of displacement of particle from $t = 0$s to $t = 5$s is 2 m

(3) The average speed of particle from $t = 0$s to $t = 5$s is 0.8 m/s.

(4) The speed of particle is zero somewhere between $t = 3$s to $t = 4$s.

24. Velocity (in m/s) of a particle moving in a straight line is given by $V = (t^2 - 2t + 1)$:

List-I		List-II	
(P)	Velocity (in m/s) of particle at $t = 3$ sec is	(I)	1
(Q)	Acceleration (in m/s^2) of particle at $t = 2$ is	(II)	2
(R)	Time when particle is at rest is (in second)	(III)	3
(S)	Magnitude of average acceleration of particle in first one second is (in m/s^2)	(IV)	4

(1) P-III; Q-II; R-IV; S-I

(2) P-IV; Q-III; R-II; S-I

(3) P-IV; Q-II; R-I; S-I

(4) P-I; Q-IV; R-III; S-II

26. Fi
x-

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(2
(3
(4

27. In
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(1

(1

(1

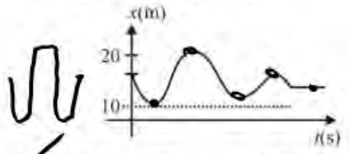
$V = t^2 - 2t + 1$

$= 9 - 6 + 1$

$= 4$

$a = 2t - 2$

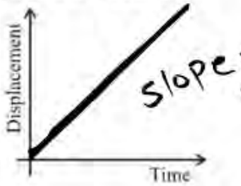
26. Figure shows the position of a particle moving along x-axis as a function of time:



(1) The particle has come to rest 5 times
(2) The particle has come to rest 4 times
(3) The particle has come to rest 3 times
(4) The particle has come to rest 2 times

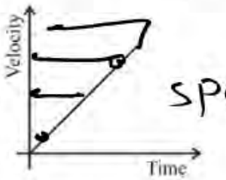
27. In which of the graphs the particle moving on straight line is speeding up?

(I)



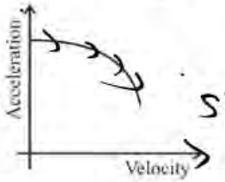
slope = (tanθ)
V = (tanθ)

(II)



speed (v) = ↑

(III)



speed ↑

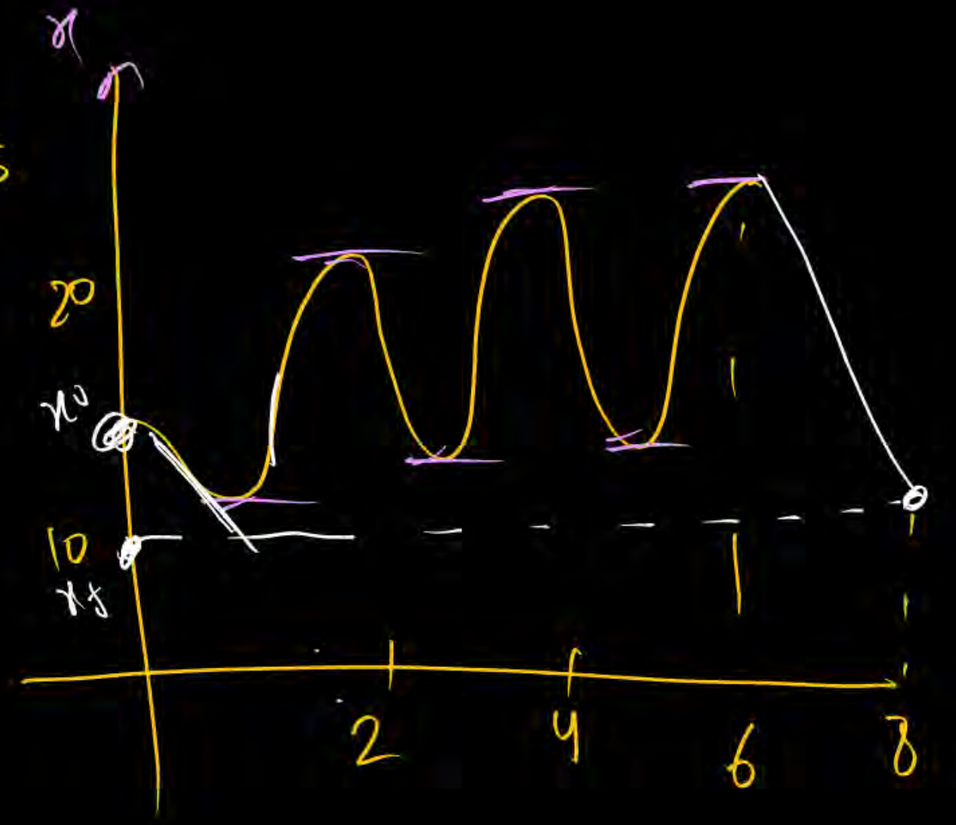
(IV)

v ↓

(1) II, III, IV (2) II, IV
(3) II, III (4) Only II

25

Ans (1) & (3)



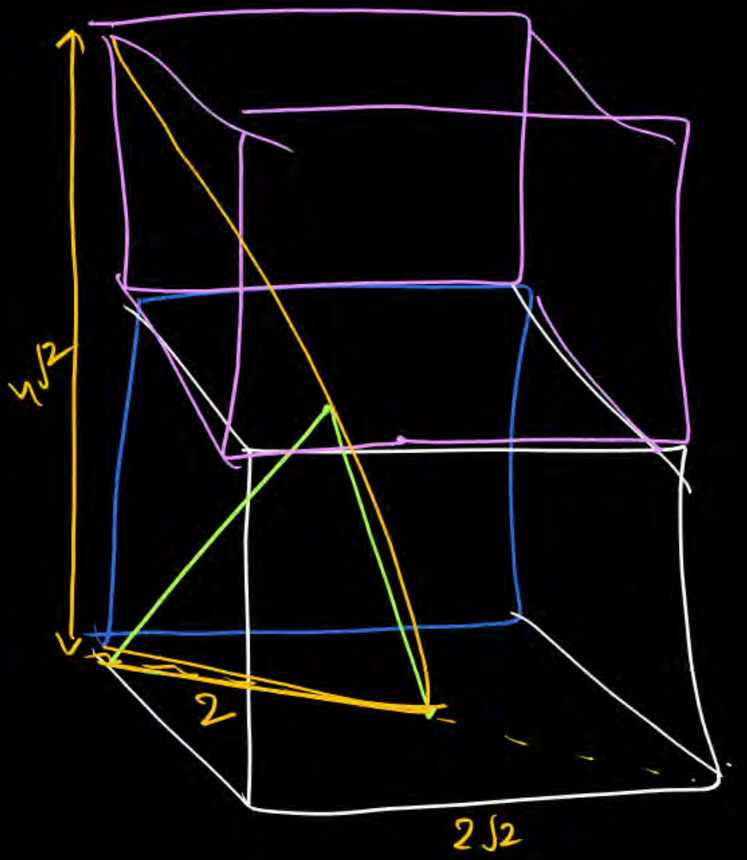
π π

12. A person sitting on the floor of a cubical room of side 2.82 m at the centre. He throws a ball towards the roof and the ball after striking the roof, rebounds to hit one of the corner of floor. The distance traversed by the ball is

(1) $(2\sqrt{2}+2\sqrt{3})$ m (2) 4m

(3) 2m (4) $4\sqrt{3}$ m

Ans → 6m



$\sqrt{(4\sqrt{2})^2+(2\sqrt{2})^2} = \sqrt{4+16\times2}$

$= \sqrt{36}$

$= 6m$

THANK YOU