PHYSICS

BOOKS - BITSAT GUIDE PHYSICS (HINGLISH)

MOTION IN !,2,2 DIMENSIONS AND POJECTILE MOTION

Others

1. A cat wants to catch a rat. The cat follows the path whose equation is $x + y = 0$. But rat follows the path whose equation is $x^2 + y^2 = 4$. The coordinates of possible points of catching the rat are

A. $(\sqrt{2}, \sqrt{2})$

B. $(-\sqrt{2}, \sqrt{2})$

C. $(\sqrt{2}, \sqrt{3})$

D. $(0, 0)$

Answer:

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2. Speed is too velocity is

A. centrimetre is too metre

B. force is too torque

C. velocity is too acceleration

D. distance is too displacement

Answer:

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3. A person travelling on a straight line moves with a uniform velocity v_1 for some time and with uniform velocity v_2 for the next equal time. The average velocity v is given by

A. $v = \frac{v_1 + v_2}{2}$

B. $\frac{2}{v} = \frac{1}{v_1} + \frac{1}{v_2}$

C. $v = \sqrt{v_1 v_2}$

D. $\frac{1}{v} = \frac{1}{v_1} = \frac{1}{v_2}$

Answer:

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4. A car moves at $80km$ in the first half of total time of motion and at $40km$ in the later half. Its average speed is

A. $60km/h$

B. $30km/h$

C. $120km/h$

D. none of these

Answer:

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5. A particle moves with constant speed v along a regular hexagon $ABCDEF$ in the same order. Then the magnitude of the avergae velocity for its motion form A to

A. v

B. $\frac{v}{2}$

C. $\frac{\sqrt{3}v}{2}$

D. none of these

Answer:

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6. During the shooting of a superhit film 'MARD' Amitabh Bachahan was waiting for his beloved Amrita Singh with his dog. When he saw her approaching, thedog was excited and dashed to her than back to master and so on, never stopping. How far would you estimate the dog ran if his speed is $30km/h$ and each

of them walked at $4km/h$, starting $400m$ apart?

A. $400m$

B. $880m$

C. $1500m$

D. $30km$

Answer:

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7. Two particles start from the same point with different speeds but one moves along $y = a \sin \omega x$ and other moves along curve $y = \cos \omega x$

A. they must collide after some time

B. they never collide with each other

C. they may collide at the point $P\left(\frac{\pi}{4\omega}, \frac{a}{\sqrt{2}}\right)$

D. they must collide at the point P

Answer:

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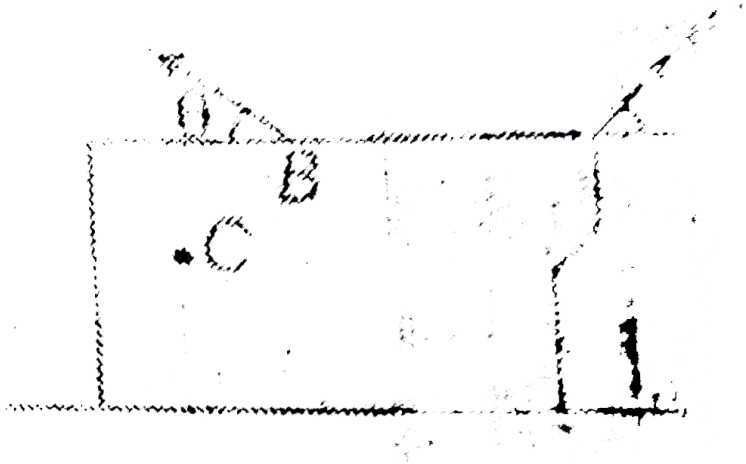
8. A sheet of wood moves over a smooth surface (shown in the figure). The magnitude of velocity of C is



A. v

B. $2v\cos\theta$

C. $2v\sin\theta$

D. $2v$

Answer:

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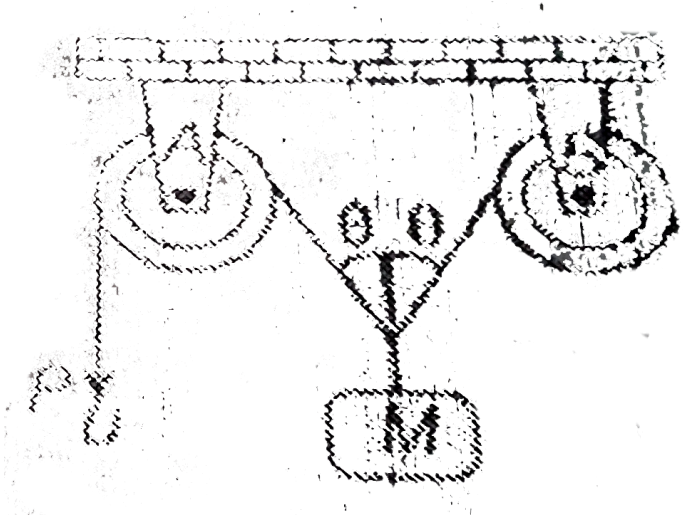
9. In the arrangement shown in figure, the ends P and Q of an inextensible string move downwards with uniform speed u. Pulleys A

and B are fixed. The mass m moves upwards with a speed



A. $2u\cos\theta$

B. $\dfrac{u}{\cos\theta}$

C. $\dfrac{2u}{\cos\theta}$

D. $u\cos\theta$

Answer:

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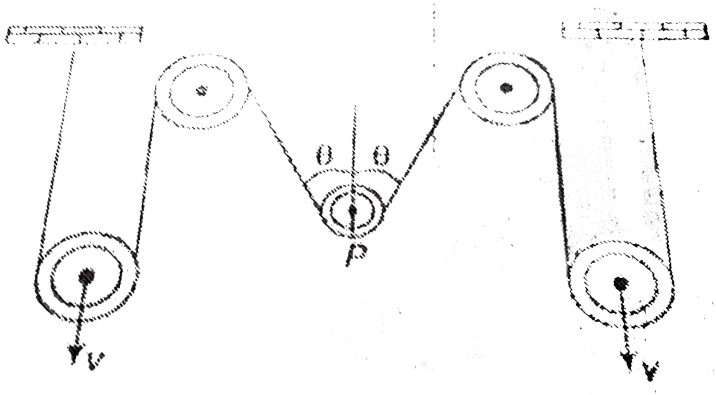
10. In the figure find the speed of pulley P



A. $\frac{v}{2}$

B. $2v\cos\theta$

C. $-\frac{2v}{\cos\theta}$

D. $\frac{v}{2\sin\theta}$

Answer:

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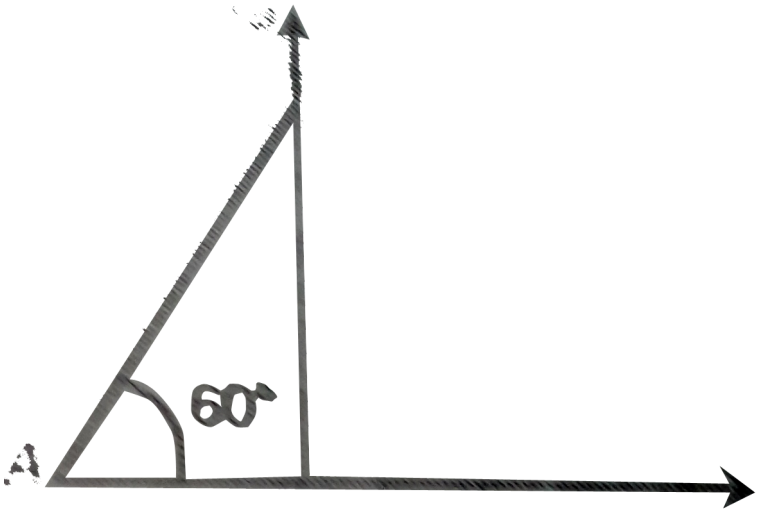
11. A link AB is moving in a vertical plane. At a certain instant when the link is inclined 60° to the horizontal the point A is moving horizontaly at $3m/s$, while B is moving in the

vertical direction. What is the velocity of B?



A. $\frac{1}{\sqrt{3}} m/s$

B. $2\sqrt{3} m/s$

C. $\sqrt{3} m/s$

D. $\frac{\sqrt{3}}{2} m/s$

Answer:

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12. Two intersecting straight lines move parallel to themselves with speeds $3m/s$ and $4m/s$, respectively. The speed of the point of intersection of the lines, if the angle between them is 90° will be

A. $5m/s$

B. $3m/s$

C. $4m/s$

D. none of these

Answer:

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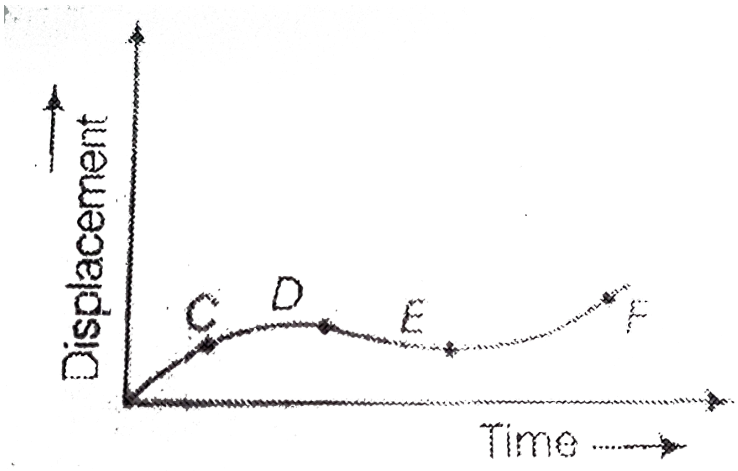
13. The displacement time graph is shown in figure. The instantaneous velociyt is negative

at the point.



A. D

B. F

C. C

D. E

Answer:

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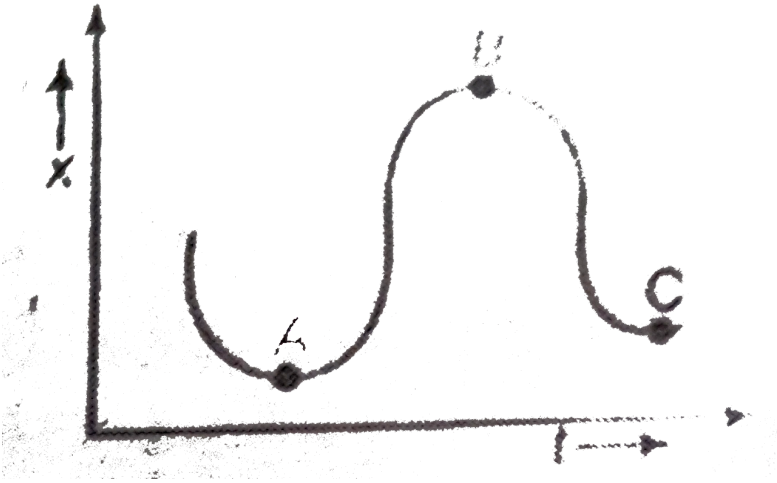
14. In the given $x - t$ curve,



A. the velocity at A is zero but at B is non-zero

B. the velocity at A and B are zero

C. the velocity at A and B are non zero

D. the directions of velocity at A and B are definite

Answer:

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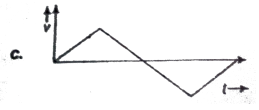
15. Which of the following speed time graph exists in the nature?

A. 

B. 

C. 

D. All of the above

Answer:

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16. Two particles describes the same circle of radius a in the same sense with the same speed v. What is their relative angular velocity?

A. v/a

B. $2v/a$

C. $v/2a$

D. va

Answer:

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17. A particle starts with a velocity of $2m/s$ and moves in a straight line with a retardation

of $0.1m/s^2$. The time that it takes to describe $15m$ is

A. $10s$ in its backward journey

B. $30s$ in its forward journey

C. $10s$ in its forward journey

D. $30s$ in its backward journey

Answer:

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18. A particle starts from rest with acceleration $2m/s^2$. The acceleratioin of the particle of the particle descreases down to zero uniformly during time -interval of $4s$. The velocity of particle after $2s$ is

A. $3m/s$

B. $4m/s$

C. zero

D. $8m/s$

Answer:

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19. An aeroplane moves $400m$ towards north, $300m$ towards west and then $1200m$ vertically upward. Then its displacement from the initial position is

A. $1300m$

B. $1400m$

C. $1500m$

D. $1600m$

Answer:

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20. The displacement of a particle is moving by $x = (t-2)^2$ where x is in metres and t in second. The distance covered by the particle in first 4 seconds is.

A. $4m$

B. $8m$

C. $12m$

D. $16m$

Answer:

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21. A person walks up a stalled escalator in 90 s. When standingon the same escalator, now moving, he is carried in 60 s.The time it would take him to walk up the moving escalator will be:

A. $27s$

B. $72s$

C. $18s$

D. $36s$

Answer:

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22. A body starts from rest and moves with constant acceleration. The ratio of distance covered by the body in nth second to that covered in n second is.

A. $\frac{2}{n} - \frac{1}{n^2}$

B. $\frac{1}{n^2} - \frac{1}{n}$

C. $\frac{2}{n^2 - \frac{1}{n}}$

D. $\frac{2}{n} + \frac{1}{n^2}$

Answer:

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23. A particle moving with a uniform acceleration along a straight line covers distances a and b in successive intervals of p

and q second. The acceleration of the particle is

A. $\frac{pq(p+q)}{2(bp-aq)}$

B. $\frac{2(aq-bp)}{pq(p-q)}$

C. $\frac{bp-aq}{pq(p-q)}$

D. $\frac{2(bp-aq)}{pq(p+q)}$

Answer:

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24. A body moves along x-axis with velocity V_x at position x. If the plot $v_x - x$ is an ellipse with major axis $2A$ and minor axis $2V_0$ the maximum acceleration has a modulus

A. $\frac{V_0^2}{A}$

B. $\frac{A}{V_0^2}$

C. $V_0 A$

D. none of these

Answer:

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25. The distance time graph of a particle at time t makes angle 45° with respect to time axis. After $1s$, if makes angle 60° with respect to time axis. What is the acceleration of the particle?

A. $\left(\sqrt{3}-1\right)$ unit

B. $\left(\sqrt{3}+1\right)$ unit

C. $\sqrt{3}$ unit

D. 1 unit

Answer:

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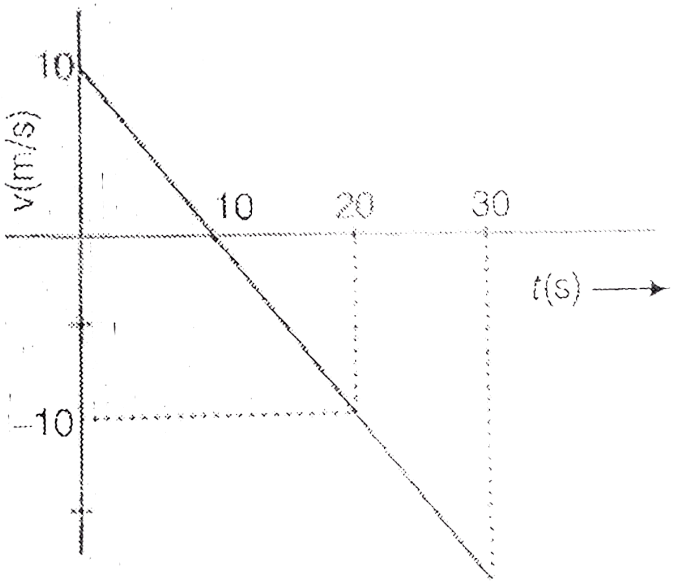
26. The velocity-time plot for a particle moving on a straight line is shown in the figure, then



A. The particle has a constant acceleration

B. the particle has never turned around

C. the average speed in the interval 0 to $10s$ is the same as the average speed in the interval $10s$ and $20s$

D. Both (a) and (c) are correct

Answer:

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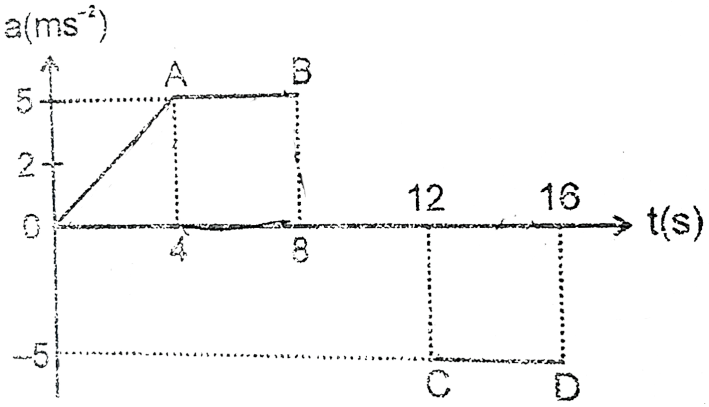
27. The acceleration of a train between two stations 2 kilometre apart is shown in the figure. If train starts from rest than maximum speed of the train is



A. $60m/s$

B. $30m/s$

C. $120m/s$

D. $90m/s$

Answer:

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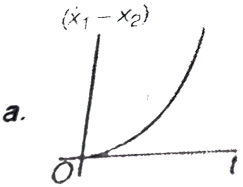
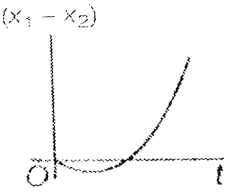
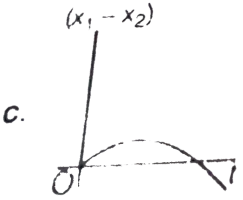
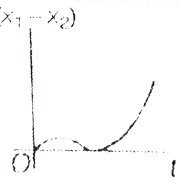
28. A body is at rest at $x = 0$. At $t = 0$, it starts moving in the positive $x - direction$ with a constant acceleration . At the same instant another body passes through $x = 0$ moving in the positive $x - direction$ with a

constant speed . The position of the first body is given by $x_1(t)$ after time 't', and that of the second body by $x_2(t)$ after the same time interval . which of the following graphs correctly describes $(x_1 - x_2)$ as a function of time 't' ?

A. 

B. 

C. 

D. d. 

Answer:

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29. A particle moves in a straight line, so that after t second, the distance x from a fixed point O on the line is given by $x = (l-2)^2(t-5)$. Then

A. after $2s$ velocity of particle is zero

B. after $2s$, the particle reaches at O

C. the acceleation is negative when $t < 3s$

D. All of the above

Answer:

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30. A bird flies for 4s with a velocity $V = (t-2)m/s$ in a straight line where t= time in second Calculate the displacement and distance covered by the bird

A. 2

B. 4

C. 6

D. 8

Answer:

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31. The velocity of particle is $v = v_0 + \mathrm{gt} + ft^2$. If its position is $x = 0$ at

$t = 0$ then its displacement after unit time $(t = 1)$ is

A. $v_0 + 2g + 3f$

B. $v_0 + \frac{g}{2} + \frac{f}{3}$

C. $v_0 + g + f$

D. $v_0 + \frac{g}{2} + f$

Answer:

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32. A particle located at $x = 0$ at time $t = 0$, starts moving along with the positive $x - direction$ with a velocity 'v' that varies as $v = a\sqrt{x}$. The displacement of the particle varies with time as

A. t^2

B. t

C. $t^{1/2}$

D. t^3

Answer:

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33. A particle moves as such acceleration is given by a = 3 sin 4t, then :

A. the initial velocity of the particle must be zero

B. the acceleration of the particle becomes zero after each interval of $\frac{\pi}{4}$ second

C. the particle does not cfome at its initial positio after some time

D. the particle must move on a circular path

Answer:

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34. A particle moves along a straight line such that its position x at any time t is $x = 3t^2 - t^3$, where x is in metre and t in second the

A. at $t = 0$ acceleration is $6m/s^2$

B. $x - t$ curve has maximum at $8m$

C. $x - t$ curve has maximum at $2s$

D. Both (a) and (c) are correct

Answer:

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35. The motion of a body falling from rest in a resting medium is described by the equation $\frac{dv}{dt} = a - bv$, where a and b are constant. The velocity at any time t is

A. $a\left(1-b^{2t}\right)$

B. $\frac{a}{b}\left(1-e^{-bt}\right)$

C. abe^{-t}

D. $ab^2(1-t)$

Answer:

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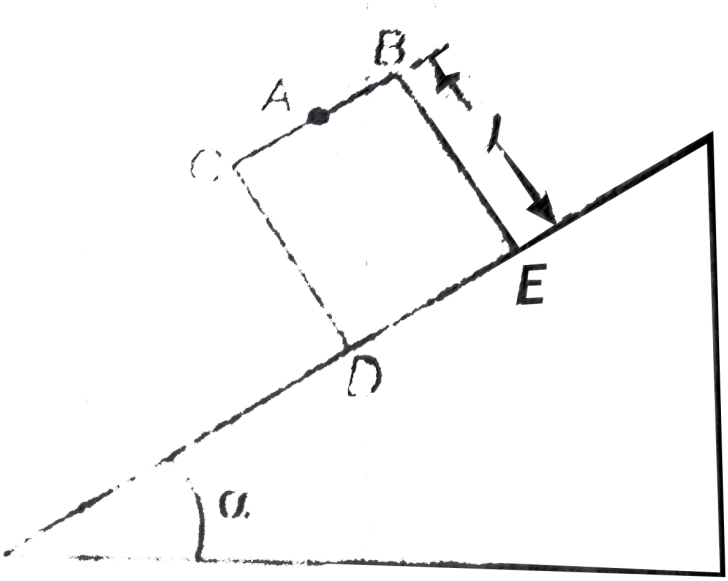
36. A rectangular box is sliding on a smooth inclined plane of inclination θ. At $t=0$ the box starts to move on the inclined plane. A

bolt starts to fall from point A. Find the time after which bolt strikes the bottom surface of the box.



A. $\sqrt{\left(\frac{2l}{g\cos\alpha}\right)}$

B. $\sqrt{\left(\frac{2l}{g\sin\alpha}\right)}$

C. $\sqrt{\left(\frac{2l}{g}\right)}$

D. $\sqrt{\left(\frac{l}{g}\right)}$

Answer:

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37. A car , starting from rest, accelerates at the rate f through a distance S then continues at constant speed for time t and then decelerates at the rate $\frac{f}{2}$ to come to rest . If the total distance traversed is $15S$, then

A. $s = t$

B. $s = \frac{1}{6} ft^2$

C. $s = \frac{1}{72} ft^2$

D. $s = \frac{1}{4} ff^2$

Answer:

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38. An object moves startig from rest through a resistive medium, such that its acceleration is related to velocity as $a = 3 - 2v$. Then

A. the terminal velocity is 1.5 unit

B. the terminal velocity is 3 unit

C. the slope of $a - v$ graph is not constant

D. initial acceleration is 2 unit

Answer:

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39. If the velocity of a moving particle $v \propto x^n$, where x is the displacement then

A. when $x = 0$ the velocity and acceleratiion are zero

B. $n > \frac{1}{2}$

C. $n < \frac{1}{2}$

D. Both (a) and (c) are correct

Answer:

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40. A particle is projected vertically upward in vacum with a speed $40m/s$ then velocity of particle when it reaches at maximum height $2s$ before, is

(Take $g = 10m/s$)

A. $20m/s$

B. $4.2m/s$

C. $9.8m/s$

D. none of these

Answer:

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41. A juggler keeps on moving four balls in the air throwing the balls after regular intervals. When one ball leaves his hand $\left(\text{speed} = 20ms^{-1}\right)$ the positions of other balls (height in m) $\left(\text{Take} g = 10ms^{-2}\right)$.

A. $10m, 20m, 10m$

B. $15m, 20m, 15m$

C. $5m, 15m, 20m$

D. $5m, 10m, 20m$

Answer:

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42. Balls are thrown vertically upwards in such a way that the next ball is thorwn when the previous one is at the maximum height. If the maximum hieght is $5m$, the number of balls thrown per minute will be

A. 60

B. 40

C. 50

D. 120

Answer:

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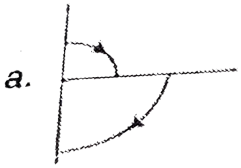
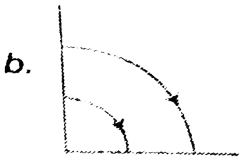
43. A ball is dropped vertically from a height d above the ground. It hits the ground and bounes up vertically to a height $d/2$. Neglecting subsequent motion and air

resistance, its speed v varies with the height h above the ground as

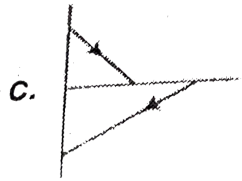
A.



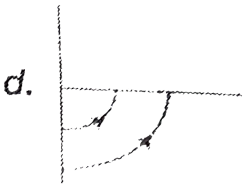
B.



C.



D.



Answer:

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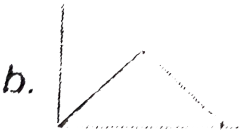
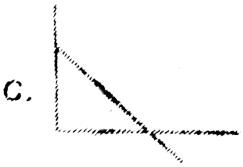
44. A ball is thrown vertically upwards. Which of the following graph/graphs represent velocity time graph of the ball during its flight (air resistance is neglected).

A. 

B. 

C. 

D. 

Answer:

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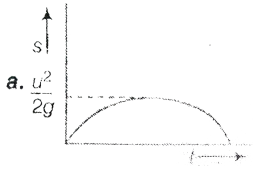
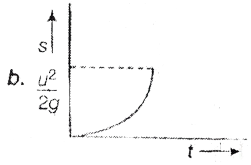
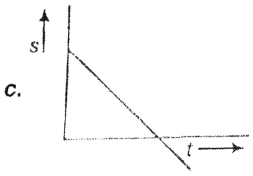
45. An object is thrown upward with a velocity u, then displacement -time graph is

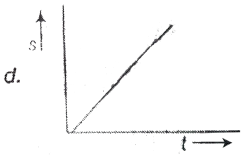
A. 

B. 

C.



D.



Answer:

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46. A balloon going upward with a velocity of $12m/s$ is at a height of $65m$ from the earthh surface at any instant. Exactly at this instant a packet drops from it. How much time will the

packet take in reaching the surface of earth?

(Take $g = 10m/s^2$)

A. $75s$

B. $10s$

C. $5s$

D. none of these

Answer:

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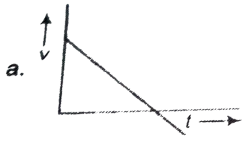
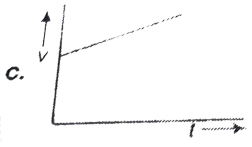
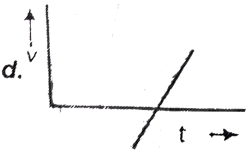
47. If a stone is relased from a balloon moving upwards with certain velocity v_0 at certain height above earth's surface then velocity time curve of stone's motion can be best represented by : (g = constant)

A. 

B. 

C. 

D. 

Answer:

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48. A particle P is at the origin starts with velocity $u = \left(2\hat{i} - 4\hat{j}\right)m/s$ with constant acceleration $\left(3\hat{i} + 5\hat{j}\right)m/s^2$. After travelling for $2s$ its distance from the origin is

A. $10m$

B. $10.2m$

C. $9.8m$

D. $11.7m$

Answer:

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49. At an instasnt t the coordinates of a particles are $x = at^2, y = bt^2$ and $z = -0$. The magnitude of velocity of particle at an instant is

A. $t\sqrt{a^2 + b^2}$

B. $\frac{v}{\sqrt{2}}$

C. $\frac{v}{\sqrt{3}}$

D. $2t\sqrt{a^2+b^2}$

Answer:

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50. If $x = a(\cos\theta + \theta\sin\theta)$ and $y = a(\sin\theta - \theta\cos\theta)$ and θ increases at uniform rate ω. The velocity of particle is

A. $a\omega$

B. $\frac{a^2\theta}{\omega}$

C. $\frac{a\theta}{\omega}$

D. $a\theta\omega$

Answer:

Watch Video Solution

51. A particle is moving with velocity $\vec{v} = k\left(y\hat{i} + x\hat{j}\right)$, where k is a constant . The genergal equation for its path is

A. $Y = X^2 + \text{constant}$

B. $Y^2 = X + \text{constant}$

C. $XY = \text{constant}$

D. $Y^2 = X^2 + \text{constant}$

Answer:

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52. A light rigid rod is placed on a smooth horizontal surface. Initially the end A begins to move vertically upward with constant

velocity v_0 and centre of the rod upward with a velocity $v_0/2$ having downward acceleration $a_0/2$, the other end moves downward with

A. zero initial velocity having zero acceleration

B. zero initial velocity having a_0 downward acceleration

C. non-zero initial velocity and zero acceleration

D. none of the above

Answer:

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53. At the top of the trajectory of a projectile, the directions of its velocity and acceleration are

A. parallel to each other

B. inclined to each other at an angle of 45°

C. anti -parallel to each other

D. perpendicular to each other

Answer:

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54. A projectile is thrown at an angle of $\theta = 45^\circ$ to the horizontal, reaches maximum reaches a maxium height of $16m$, then

A. its velocity at the highest point is zero

B. its range is $64m$

C. it is thrown at an angle of 30° its range will decrease

D. Both (a) and (c) are correct

Answer:

Watch Video Solution

55. A heavy stone is thrown from a cliff of height h in a given direction. The speed with which it hits the ground

A. must depend on the speed of projection

B. must be larger then the speed of projection

C. must be independent of the speed of projection

D. Both (a) and (c) are correct

Answer:

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56. A particle of mass m is projected with a velocity v making an angle of 45° with the horizontal. The magnitude of the angular momentum of the projectile abut the point of projection when the particle is at its maximum height h is.

A. zero initial velocity having zero acceleration

B. $\frac{mvh}{\sqrt{2}}$

C. $\frac{mvh^2}{\sqrt{2}}$

D. none of these

Answer:

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57. Two particles are projected vertically upward with the same velocity on two diferent planes with accelerations due to gravities g_1 and g_2 respectively. If they fall back to their initial points of projection after lapse of time t_1 and t_2 respectively. Then

A. $t_1 t_2 = g_1 g_2$

B. $t_1 g_1 = t_2 g_2$

C. $\frac{t_1 g_2}{t_2 g_1} = 2$

D. $t_1^2 + t_2(2) = g_1 + g_2$

Answer:

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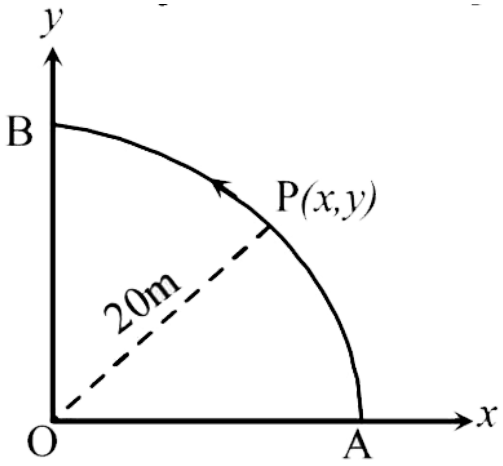
58. A point p moves in counter - clockwise direction on a circular path as shown in the figure . The movement of 'p' is such that it

sweeps out in the figure . The movement of 'p' is such that it sweeps out a length $s = t^3 + 5$, where s is in metres and t is in seconds . The radius of the path is $20m$. The acceleration of 'P' when $t = 2s$ is nearly .



A. $13ms^{-2}$

B. $12ms^{-2}$

C. $7.2ms^{-2}$

D. $14ms^{-2}$

Answer:

Watch Video Solution

59. A number of particles are projected from a given point with equal velocities in different directions in the same vertical plane. At any instant they will lie on

A. parabola

B. circle

C. hyperbola

D. rectangle

Answer:

Watch Video Solution

60. Rain water is falling vertically downward with velocity v. When velocity of wind is u in horizontal direction, water is collected at the

rate of Rm^3/s. When velocity of wind becomes $2u$ in horizontal direction. The rate of collection of water in vessel is

A. R

B. $\frac{R}{2}$

C. $2R$

D. $\frac{R\sqrt{4u^2+v^2}}{\sqrt{u^2+v^2}}$

Answer:

Watch Video Solution

61. A ball projected from ground at an angle of 45° just clears a wall infront. If point of projection is $4m$ from the foot of wall and ball strikes the ground at a distance of $6m$ on the other side of the wall, the height of the wall is

A. $4.4m$

B. $2.4m$

C. $3.6m$

D. $1.6m$

Answer:

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62. The maximum range of a bullet fired from a toy pistol mounted on a car at rest is $R_0 = 40m$. What will be the acute angle of inclination of the pistol for maximum range when the car is moving in the direction of firing with uniform velocity $V = 20m/s$, on a horizontal surface? $\left(g = 10m/s^2\right)$

A. 30°

B. 60°

C. 75°

D. 45°

Answer:

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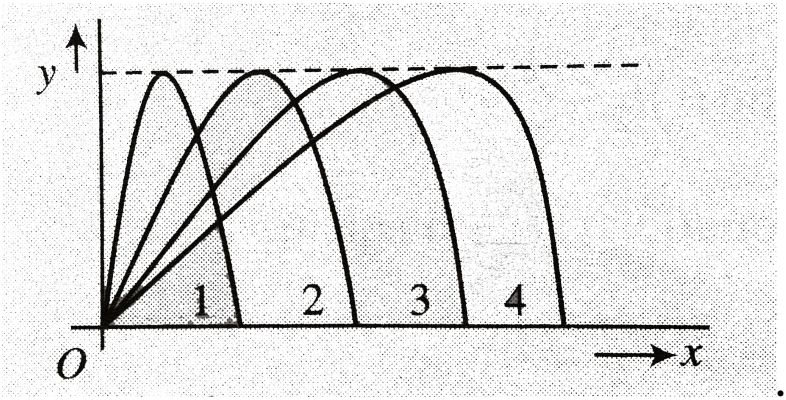
63. Figure shows four paths for a kicked football. Ignoring the effects of air on the flight, rank the paths according to the initial

horizontal velocity component, highest first.



A. 1, 2, 3, 4

B. 2, 3, 4, 1

C. 3, 4, 1, 2

D. 4, 3, 2, 1

Answer:

Watch Video Solution

64. A body is projected at an angle θ with the horzontal. When it is at the highest point, the ratio of the potential and kinetic energies of the body is s

A. $\tan\theta$

B. $\tan^2\theta$

C. $\cot\theta$

D. $\cot^2\theta$

Answer:

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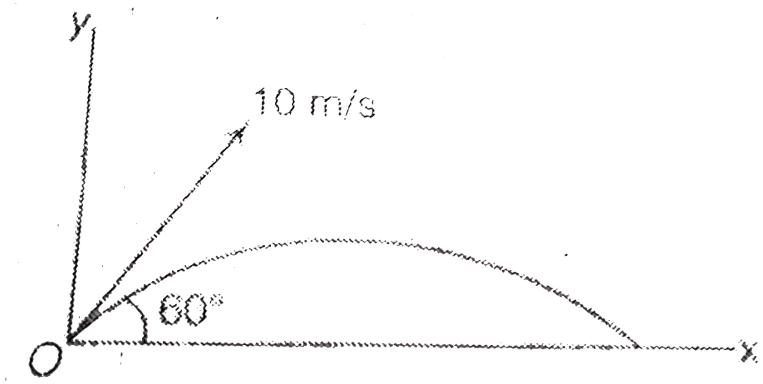
65. A particle is projected at an angle 60° with the horizontal with a speed $10m/s$. Then, latus rectum is (Take $g = 10m/s^2$)



A. $5m$

B. $15m$

C. $10m$

D. 0

Answer:

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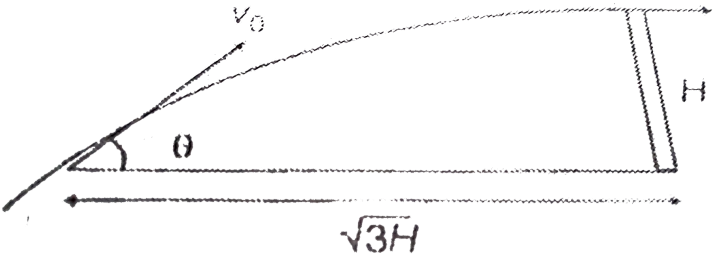
66. A projectile is thrown at an angle θ that it is just able to cross a vertical wall at its highest point of journey as shown in the figure. The angle θ at which the projectile is

thrown is given by



A. $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$

B. $\tan^{-1}(\sqrt{3})$

C. $\tan^{-1}\left(\frac{2}{\sqrt{3}}\right)$

D. $\frac{\tan^{-1}\left(\sqrt{3}\right)}{2}$

Answer: C

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67. Two cars move in the same direction along parallel roads. One of them is a $200m$, long travelling with a velocity of $20m/s$. The second one is $800m$ long travelling with a velocity of $7.5m/s$. How long will it take for the first car to overtake the second car?

A. $20s$

B. $40s$

C. $60s$

D. $80s$

Answer:

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68. A motorboat covers the distance between two spots on the river banks $t_1 = 8g$ and $t_2 = 12h$ in down stream and upstream respectively. The time required for the boat to cover this distance in still water will be

A. $6.9h$

B. $9.6h$

C. $69s$

D. $96s$

Answer:

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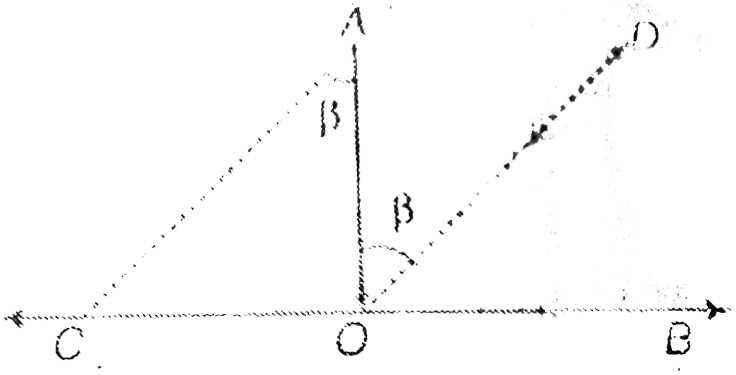
69. For a man who wants to cross the river, with the shortest path AB, find the anglet θ

(see figure)



A. $\sin^{-1}\left(\frac{3}{4}\right)$

B. $\sin^{-1}\left(\frac{4}{3}\right)$

C. 30°

D. Given situation is not possible

Answer:

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70. To a person, going eastward in a car with a velociyt of $25km/hr$, a train appears to move towards north with a velocity of $25\sqrt{3}km/hr$. The actual velocity of the train will be

A. $25km/h$

B. $50km/h$

C. $5km/h$

D. $53km/h$

Answer:

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71. A man can swim with a speed of $4kmh^{-1}$ in still water. He crosses a river 1km wise that flows steadly at $3kmh^{-1}$. If he makes his strokes normal to the river current, how far down the river does he go when he reaches the other bank?

A. $800m$

B. $900m$

C. $400m$

D. $750m$

Answer:

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72. Rain drops fall vertically at a speed of $20m/s$. At what angle do they fall on the wind screen of a car moving with a velocity of $15m/$

, if the wind screen velocity incined at an agle of 23° to the vertical $\left(\cot^{-1}\frac{4}{3} \approx 37^\circ\right)$

A. 60°

B. 30°

C. 45°

D. 90°

Answer:

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73. A bus moves over a straight level road with a constant acceleration a. A boy in the bus drops a ball out side. The acceleration of the ball w.r.t the bus and the earth are respectively

A. a and g

B. $a+g$ and $g-a$

C. $\sqrt{a^2+g^2}$ and g

D. $\sqrt{a^2+g^2}$ and a

Answer:

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74. A train accelerating uniormly from rest attains a maximum speed of $40ms^{-1}$ in $20s$. It travels at this speed for $20s$ and is brought to rest with uniform retardation i further $40s$. What is the average velocity during this period?

A. $80m/s$

B. $25m/s$

C. $40m/s$

D. $30m/s$

Answer:

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75. A ball is projected upwards from the top of a tower with a velocity $50ms^{-1}$ making an angle 30° with the horizontal. The height of tower is 70m. After how many seconds from the instant of throwing, will the ball reach the ground. $\left(g = 10ms^{-2}\right)$

A. $2s$

B. $5s$

C. $7s$

D. $9s$

Answer:

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76. A ball thrown upward from the top of a tower with speed v reaches the ground in t_1 sec. If this ball is thrown downward from the

top of the same tower with speed v it reaches the ground in t_2 sec. In what time, the ball shall reach the grouned, if it is allowed to fall freely under gravity from the top of the tower?

A. $\frac{t_1 + t_2}{2}$

B. $\frac{t_1 - t_2}{2}$

C. $\sqrt{t_1 t_2}$

D. $t_1 + t_2$

Answer:

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77. A man runs at a speed of $4m/s$ to overtake a standing bus. When he is $6m$ beind the door at $t = 0$, the bus mover forward and continuous with a constant acceleration of $1.2m/s^2$. The man reaches the door in time t. Then

A. $4t = 6 + 0.6t^2$

B. $1.2t^2 = 4t$

C. $4t^2 = 1.2t$

D. $6 + 4t = 0.2t^2$

Answer:

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78. For a given velocity, a projectile has the same range R for two angles of rpojection if t_1 and t_2 are the times of flight in the two cases then

A. $t_1 t_2 \propto R$

B. $t_1 t_2 \propto R^2$

C. $t_1 t_2 \propto \frac{1}{R^2}$

D. $t_1 t_2 \propto \frac{1}{R}$

Answer:

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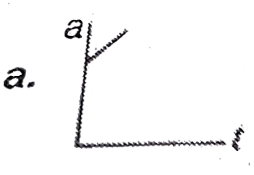
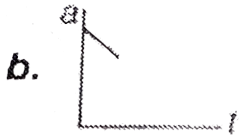
79. A body moves with uniform acceleration, which of the following graph is correct?

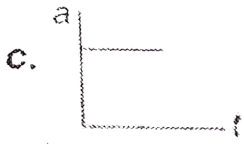
A.



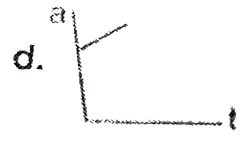
B.



C.



D.



Answer:

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80. One second after the projection, a stone moves at an angle of 45° with the horizontal. Two seconds from the start,

it is travelling horizontally. Find the angle of

projection with the horizontal. $\left(g = 10ms^{-2}\right)$

.

A. 60°

B. $\tan^{-1}(4)$

C. $\tan^{-1}(3)$

D. $\tan^{-1}(2)$

Answer:

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81. A body covers a total distance of $3s$. The first s is covered with a velocity u the second s with V and the last s with ω. Then, the average velocity during the whole journey is

A. $\frac{u+v+\omega}{3}$

B. $\frac{3uv\omega}{u+v+\omega}$

C. $\frac{3uv\omega}{uv+v\omega+u\omega}$

D. zero

Answer:

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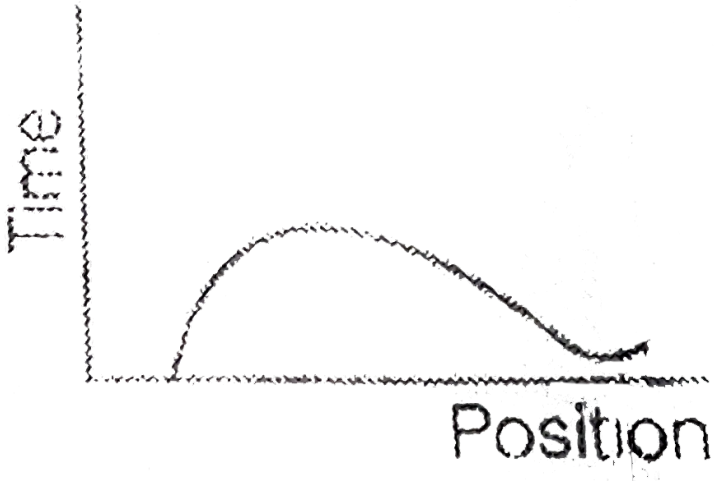
82. Do we observe the time variation of position is nature as shown in the graph?



A. yes

B. no

C. often

D. Rarely

Answer:

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83. If a body is projected with an angle θ to the horizontal, then

A. the velcity is always perpendicular to its acceleration

B. its velocity becomes zero at its maximum heigth

C. its velocity makes zero angle with the horizontal at its maximum height

D. the body just bevore hitting the ground, the direction of velocity coincides with the acceleration

Answer:

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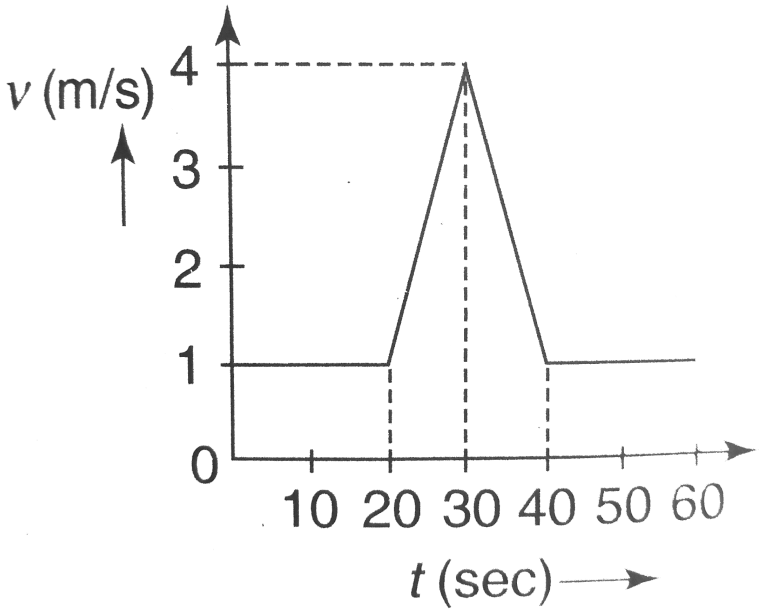
84. Velocity-time graph for a moving object is shown in the figure. Total displacement of the object during the time interval when there is non-zero acceleration and retardation is.



A. $60m$

B. $50m$

C. $30m$

D. $40m$

Answer:

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85. At the top of the trajectory of a projectile, the directions of its velocity and acceleration are

A. perpendicular to each other

B. parallel to each other

C. inclined to each other ant an angle of 45°

D. anti-parallel to each other

Answer:

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86. At what point of a projectile motion acceleration and velocity are perpendicular to each other

A. At the point of projection

B. at the point of drop

C. At the top most point

D. Anywhere in between the point of projection and top most point

Answer:

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87. From the top of a tower two stones, whose masses are in the ratio 1 : 2 are thrown one straight up with an initial speed u and the second straight down with the same speed u . Then, neglecting air resistance

A. the heavier stone hits the ground with a higher speed

B. the lighter stone hits the ground with a higher speed

C. both the stone will have te same speed when they hit the ground

D. the speed cannot be determined with the given data

Answer:

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