ATUL CLASSES

Test / Exam Name: Atul Classes **Standard: 11th Science** **Subject: Physics**

Student Name: ..... **Section:** ..... **Roll No.:** .....

Questions: 100 **Time: 01:00 hh:mm** **Negative Marks: 0** **Marks: 100**

Q1. A ball is thrown up in the sky. After reaching a height, the ball falls back. What can be said about the average velocity? **1 Mark**

A It is non zero **B** It is zero **C** It is greater than zero
D It is less than zero

Q2. What kind of motion is rectilinear motion? **1 Mark**

A One dimensional **B** Two dimensional **C** Three dimensional **D** Zero dimensional

Q3. Which of the following statements is incorrect? **1 Mark**

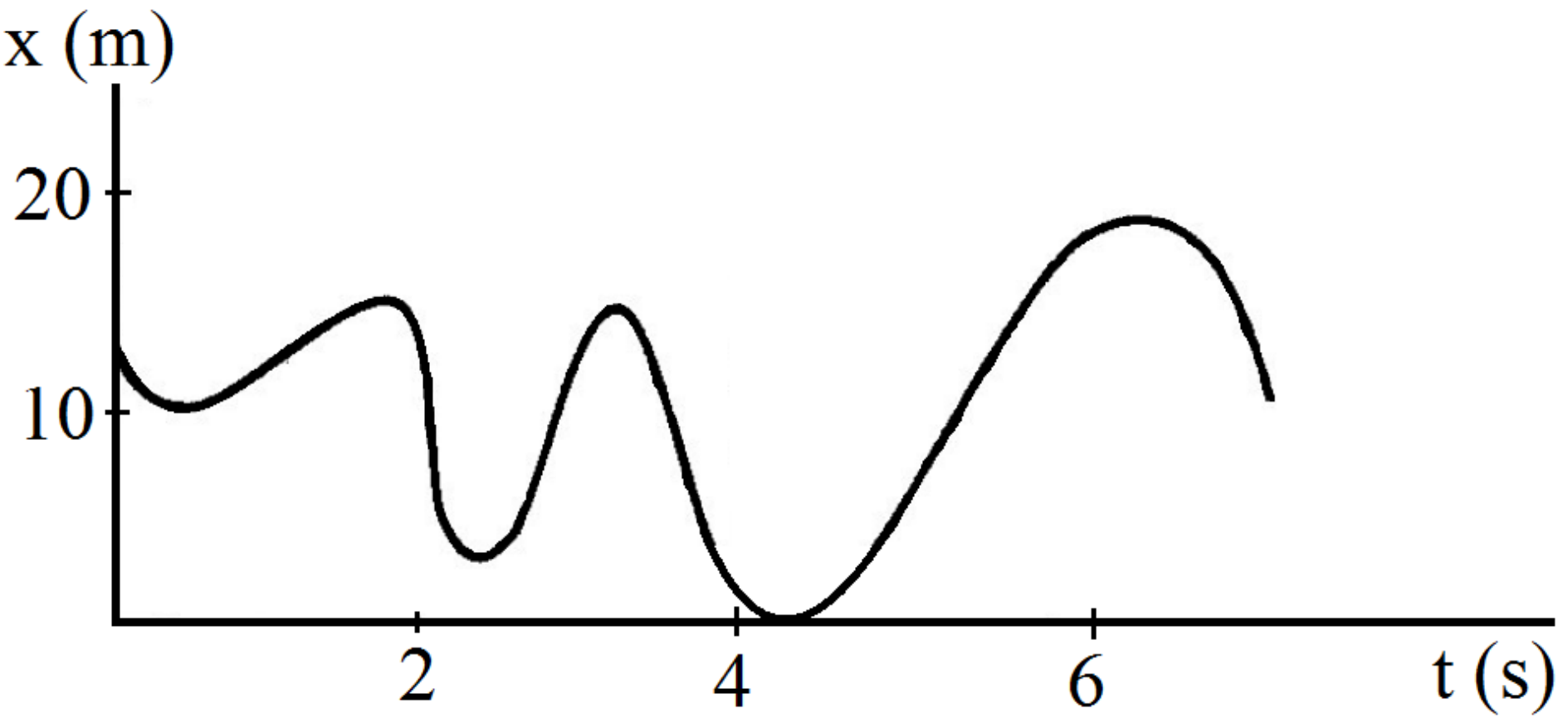
A
In one dimension motion, the velocity and the acceleration of an object are always along the same line.

B
In two or three dimensions, the angle between velocity and acceleration vectors may have any value between 0° and 180°.

C
The kinematic equations for uniform acceleration can be applied in case of uniform circular motion.

D
The resultant acceleration of an object in circular motion is towards the centre only if the speed is constant.

Q4. Figure shows the position of a particle moving on the X-axis as a function of time. **1 Mark**



A The particle has come to rest 6 times. **B** The maximum speed is at t = 6s.
C The velocity remains positive for t = 0 to t = 6s.
D The average velocity for the total period shown is negative.

Q5. Which of the following terms does not go well with the motion of a bus on a crowded road. **1 Mark**

A Uniform velociity **B** Variable velocity **C** Variable acceleration
D Variable speed

Q6. A ball is thrown up in the sky, at what position will the instantaneous speed be minimum? **1 Mark**

A Initial position **B** Final position **C** Halfway through the whole trajectory
D After covering one fourth of the whole trajectory

Q7. An object starts 5m from origin and moves with an initial velocity of $5ms^{-1}$ and has an acceleration of $2ms^{-2}$. After 10sec, the object is how far from the origin? **1 Mark**

A 150m **B** 145m **C** 155m **D** 55m

Q8. Consider two observers moving with respect to each other at a speed v along a straight line. They observe a block of mass m moving a distance l on a rough surface. The following quantities will be same as observed by the two observers. **1 Mark**

A Kinetic energy of the block at time t **B** Work done by friction
C Total work done on the block **D** Acceleration of the block

Q9. An iron sphere of mass 10kg has the same diameter as an aluminium sphere of mass is 3.5kg. Both spheres are dropped simultaneously from a tower. When they are 10m above the ground, the have the same: **1 Mark**

A Acceleration **B** Momenta **C** Potential energy **D** Kinetic energy

Q10. For the one-dimensional motion, described by $x = t - \sin t$. **1 Mark**

A x (t) > 0 for all t > 0. **B** v (t) > 0 for all t > 0. **C** a (t) > 0 for all t > 0.
D v (t) lies between 0 and 2.

Q11. A stone falls from a balloon that is descending at a uniform rate of 12m/ s. the displacement of the stone from the point of release 10sec is: **1 Mark**

A 490m **B** 510m **C** 610m **D** 725m

Q12. If the velocity of a body does not change, its acceleration is: **1 Mark**

A Zero **B** Infinite **C** Unity **D** None of these

Q13. A body thrown vertically up from the ground passes the height 10.2m twice at an interval of 10s. What was its initial velocity? (in m/ s) **1 Mark**

A 52 **B** 53 **C** 51 **D** 49

Q14. A body X is projected upwards with a velocity of $98ms^{-1}$, after 4s, a second body Y is also projected upwards with the same Y is also projected upwards with the same initial velocity. Two bodies will meet after: **1 Mark**

A 8s **B** 10s **C** 12s **D** 14s

Q15. A driver takes 0.20s to apply the brakes after he sees a need for it. This is called the reaction time of the driver. If he is driving a car at a speed of 54km/ h and the brakes causes a deceleration of 6.0 m/ s^2, find the distance traveled by the car after he sees the need to put the brakes on. **1 Mark**

A 18.63m **B** 20m **C** 26.85m **D** 27.67m

Q16. A spring with one end attached to a mass and the other to a rigid support is stretched and released: **1 Mark**

A Magnitude of acceleration, when just released is maximum.
B Magnitude of acceleration, when at equilibrium position, is maximum.
C Speed is maximum when mass is at equilibrium position.
D Magnitude of displacement is always maximum whenever speed is minimum.

Q17. A man of mass 60kg and a boy of mass 30kg are standing together on frictionless ice surface. If they push each other apart man moves away with a speed of 0.4m/ s relative to ice. After 5sec they will be away from each other at a distance of. **1 Mark**

A 9.0m **B** 3.0m **C** 6.0m **D** 30,

Q18. What happen to the instantaneous velocity in a non - uniformly accelerated motion? **1 Mark**

A It increases **B** It decreases **C** It varies as the acceleration
D It remains constant

Q19. Velocity - time graph of a body with uniform velocity is a straight line: **1 Mark**

A Parallel to x - axis **B** Parallel to y - axis **C** Inclined to x - axis **D** Inclined to y - axis

Q20. Which of the following can be used to describe how fast an object is moving along with the direction of motion at a given instant of time? **1 Mark**

A Instantaneous velocity **B** Instantaneous speed **C** Average velocity
D Average speed

Q21. Mark the correct statements: **1 Mark**

A The magnitude of the velocity of a particle is equal to its speed.
B
The magnitude of average velocity in an interval is equal to its average speed in that interval
C
It is possible to have a situation in which the speed of a particle is always zero but the average speed is not zero.
D
It is possible to have a situation in which the speed of the particle is never zero but the average speed in an interval is zero.

Q22. An object may have: **1 Mark**

A Varying speed without having varying velocity.
B Varying velocity without having varying speed.
C Nonzero acceleration without having varying velocity.
D Nonzero acceleration without having varying speed.

Q23. A stone drop from height 'h' on Earth surface fall in 1sec. If the same stone taken to Moon and drop freely then it will reaches from the surface of the Moon in the time (The 'g' of Moon is 1/6 times of Earth):- **1 Mark**

A $\sqrt{6}$ second **B** 9 second **C** $\sqrt{3}$ second **D** 6 second

Q24. Which of the following types of motion cannot describe the motion of a clock's hands? **1 Mark**

A Rectilinear **B** Circular **C** Periodic **D** Harmonic

Q25. A body starts from rest and moves with uniform acceleration for 3s. It then decelerates uniformly for 2s. and stops. If the deceleration is 3 ms^{-2} the maximum velocity of the body is ____ ms^{-1} **1 Mark**

A Zero **B** 2 **C** 6
D Cannot be determined

Q26. A particle is found to be at rest when seen from a frame S_1 and moving with a constant velocity when seen from another frame S_2. Mark out the possible options. **1 Mark**

A Both the frames are inertal. **B** S_1 is inertial and S_2 is noninertial.
C S_1 is noninertial and S_2 is inerital. **D** None of these.

Q27. Which of the following statement is correct? **1 Mark**

A Average speed > Instantaneous speed. **B** Average speed >= Instantaneous speed.
C Average speed <= Instantaneous speed. **D** Average speed < Instantaneous speed.

Q28. The rate of change of velocity is: **1 Mark**

A Force **B** Momentum **C** Acceleration **D** Displacement

Q29. **1 Mark**

Two stones are dropped down simultaneously from different heights. At the starting time, the distance between them is 30cm. After 1s, the distance between the two stones will be ($g = 10ms^{-2}$).

A 10cm **B** 20cm **C** 30cm **D** 0cm

Q30. A and B are arguing about uniform acceleration. A states that acceleration means "the longer you go." B states that acceleration means "the further you go." Who is right? **1 Mark**

A A **B** B **C** Both A and B **D** None of these

Q31. A stone is released with acceleration 'a' from an upwardy moving left. Find out the acceleration and direction of the stone. **1 Mark**

A A in upward direction. **B** (g + a) in downward direction. **C** (g - a) in upward direction.
D g in downward direction.

Q32. Which of the following are obtained by dividing total displacement by total time taken? **1 Mark**

A Average velocity **B** Instantaneous velocity **C** Uniform velocity
D Speed

Q33. The velocity of a particle is zero at t = 0. **1 Mark**

A The acceleration at t = 0 must be zero. **B** The acceleration at t = 0 may be zero.
C If the acceleration is zero from t = 0 to t = 10s, the speed is also zero in this interval.
D If the speed is zero from t = 0 to t = 10s the acceleration is also zero in this interval.

Q34. A body falling from a high Minaret travels 40m in the last 2 seconds of its fall to ground. Height of Minaret in metres is:
(take $g = 10m/s^2$) **1 Mark**

A 60 **B** 45 **C** 80 **D** 50

Q35. The displacement of a particle is given by $x = (t - 2)^2$ where x is in metres and t in seconds. The distance covered by the particle in first 4 seconds is: **1 Mark**

A 4m. **B** 8m. **C** 12m. **D** 16m.

Q36. Three particles start from origin at the same time with a velocity $2ms^{-1}$ along positive x-axis the second with a velocity $6ms^{-1}$ aling negative y - axis. Find the velocity of the third particle along x = y line so that the three particles may always lie in a straight line: **1 Mark**

A $-3\sqrt{3}$ **B** $3\sqrt{2}$ **C** $-3\sqrt{2}$ **D** $2\sqrt{2}$

Q37. A man runs at a speed of 4.0m/ s to overtake a standing bus. When he is 6.0m behind the door (at t = 0), then bus moves forward and continues with a constant acceleration of $1.2m/s^2$. The man shall access the door at time t equal to: **1 Mark**

A 5.2s **B** 4.3s **C** 2.3s
D The man shall never gain the door

Q38. An observer finds the magnitudes of the acceleration of two bodies to be the same. This necessary implies that the two bodies. **1 Mark**

A Are at rest with respect to each other.
B Are at rest or move with constant velocities with respect to each other.
C Are accelerated with respect to each other.
D
May be at rest, moving with constant velocities or accelerated with respect to each other.

Q39. A car moves for 60s covering a distance of 3600m with zero initial velocity. What is the acceleration in m/s^2? **1 Mark**

A 2 **B** 2.5 **C** 3 **D** 4.5

Q40. A body travels 200cm in the first two seconds and 220cm in the next 4 seconds with same acceleration. The velocity of the body at the end of the 7th second is: **1 Mark**

A 10cm/ s **B** 5cm/ s **C** 12cm/ s **D** 2cm/ s

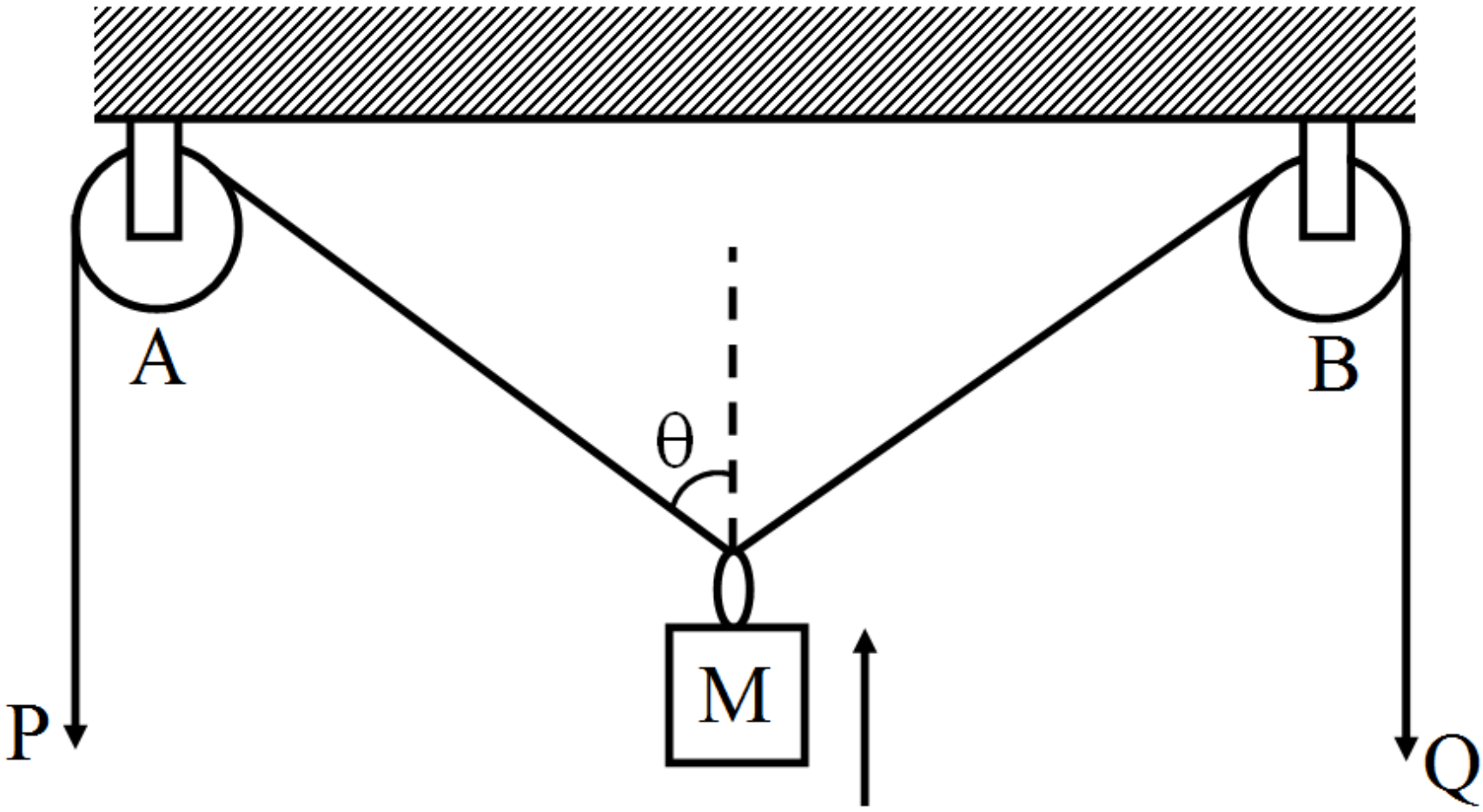
Q41. A car is travelling in the north direction. To stop, it produces a deceleration of 60m/ s^2. Which of the following is a correct representation for the deceleration? **1 Mark**

A 60m/ s^2 Northwards **B** 60m/ s^2 Southwards **C** 60m/ s^2 Eastwards **D** 60m/ s^2 Westwards

Q42. A ball of mass 0.2kg is thrown vertically upwards by applying a force by hand. If the hand moves 0.2m which applying the force and the ball goes upto 2m height further, find the magnitude of the force. Consider g = 10m/ s^2 **1 Mark**

A 22N **B** 4N **C** 16N **D** 20N

Q43. 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: **1 Mark**



A $2u\cos\theta$ **B** $\frac{u}{\cos\theta}$ **C** $\frac{2u}{\cos\theta}$ **D** $u\cos\theta$

Q44. The rate of change of velocity of an object with respect to time is called ..... **1 Mark**

A Momentum **B** Displacement **C** Acceleration **D** Impulse

Q45. Which of the following best define the acceleration of a particle: **1 Mark**

A The rate of change of velocity. **B** Only experienced during a change of direction.
C Only experienced during a change of speed.
D Calculated by multiplying speed by velocity. **E** Always constant.

Q46. An object thrown vertically upwards with a velocity of 25m/ s takes 4sec to reach the thrower. What is displacement of the object? **1 Mark**

A 100m **B** 180m **C** 0m **D** 120m

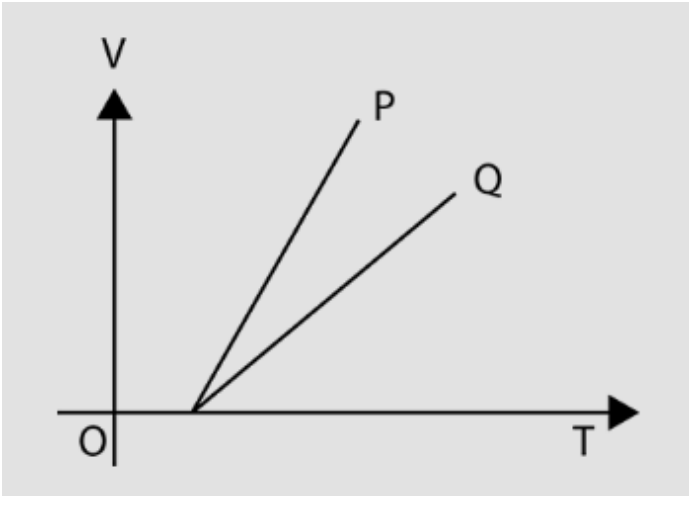
Q47. Rana moves with uniform velocity on a bike. He throws a stone in air, the stone falls: **1 Mark**

A Back in his hands **B** In front of him **C** At the back of him
D Cannot be predicted

Q48. A truck requires 3Hrs to complete a journey of 150km, what is the average speed? **1 Mark**

A 50km/ hr **B** 25km/ hr **C** 15km/ hr **D** 10km/ hr

Q49. Figure shows the V−T graph for two particles P and Q. The relative velocity of P w.r.t. Q is: **1 Mark**



A Is zero. **B** Is non-zero but constant **C** Continuously decreases
D Continuously increases

Q50. A uniformly accelerated body has ____. **1 Mark**

A Constant speed **B** Constant velocity **C** Constant force
D Constant momentum

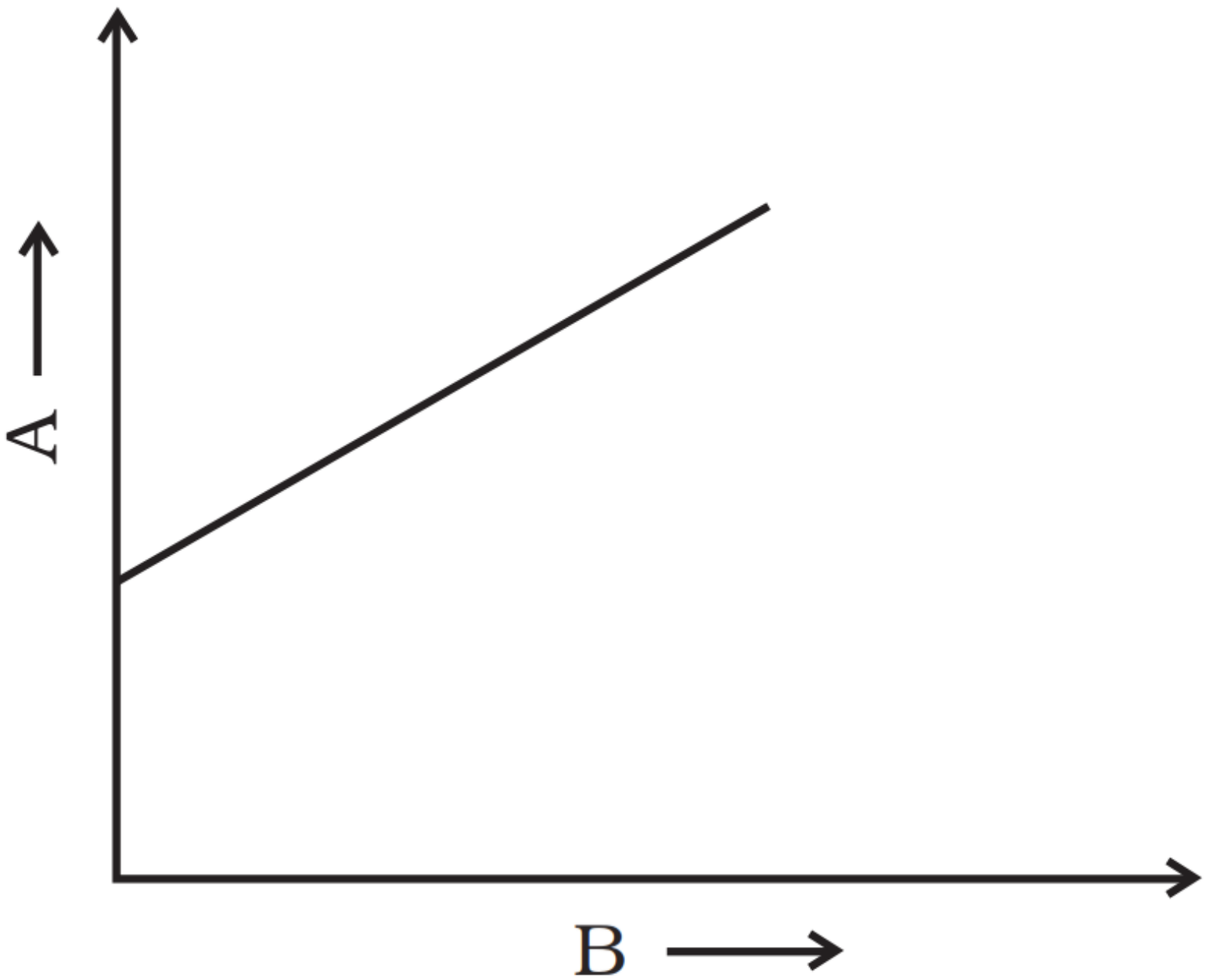
Q51. A particle is dropped from a tower. It is found that it travels 55m in the last second of its journey. Then height of the tower is (g = 10m/s^{2}g = 10m/s^2)? **1 Mark**

A 125m **B** 180m **C** 100m **D** 55m

Q52. Which force can possibly act on a body moving in a straight line? **1 Mark**

A Tangential force **B** Friction force **C** Centrifugal force **D** Centripetal force

Q53. The variation of quantity A with quantity B, plotted in Fig. describes the motion of a particle in a straight line. **1 Mark**



A Quantity B may represent time. **B** Quantity A is velocity if motion is uniform.
C Quantity A is displacement if motion is uniform.
D Quantity A is velocity if motion is uniformly accelerated.

Q54. The changes in displacement in three consecutive instances are 5m, 4m, 11m, the total time taken is 5s. What is the average velocity in m/ s? **1 Mark**

A 1 **B** 4 **C** 7 **D** 6

Q55. The velocity of a truck changes form 3m/ s to 5m/ s in 5s. What is the acceleration in m/s^2? **1 Mark**

A 0.4 **B** 0.5 **C** 4.0 **D** 5.0

Q56. A hollow iron ball (A) and a solid iron ball (B) and cricket ball (C) are dropped from the same height. Which among the three balls reaches the ground first? Assuming there is no resistance due to air. **1 Mark**

A A **B** B **C** C
D All the three balls reaches ground simultaneously.

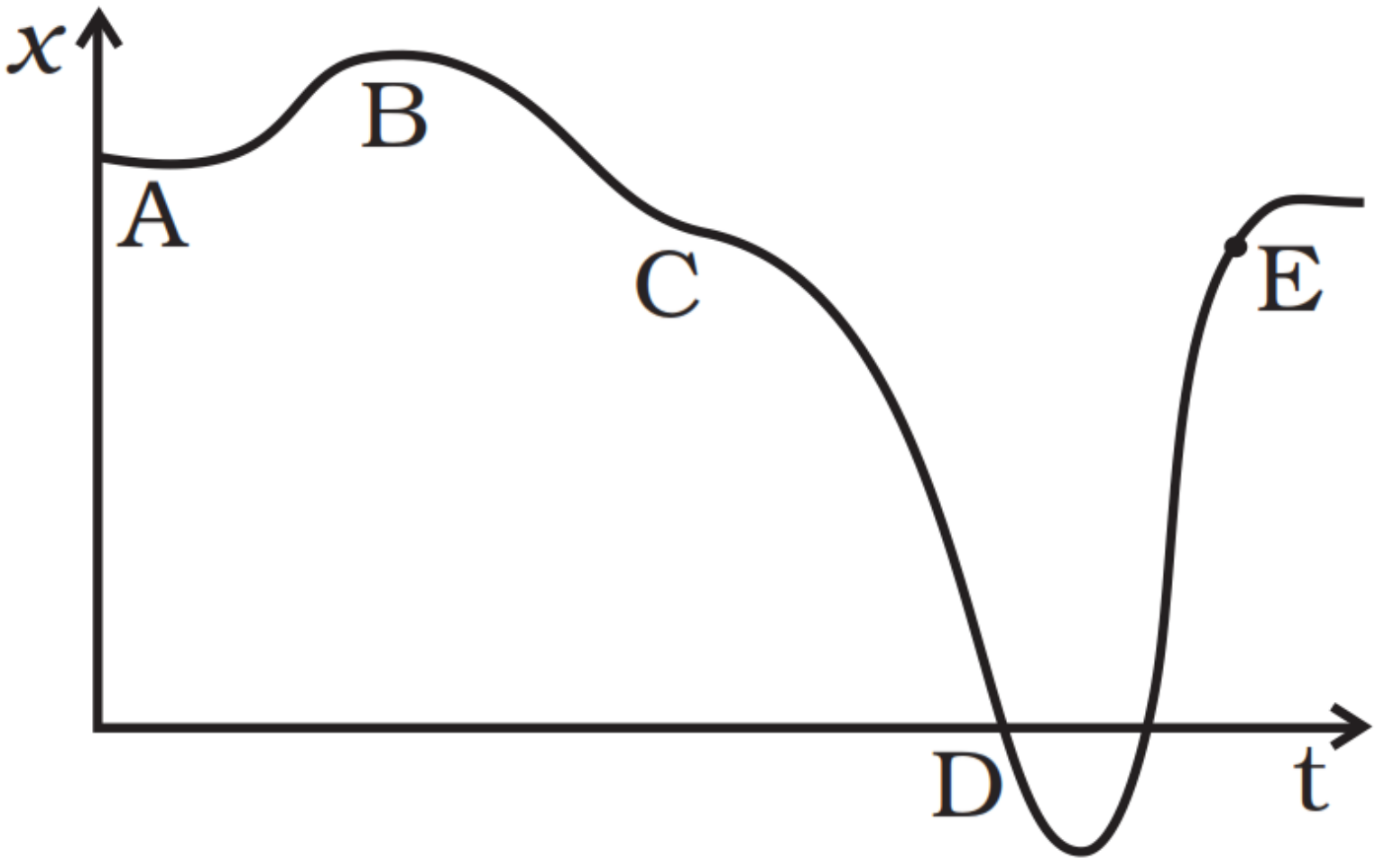
Q57. Area under a speed - time graph gives: **1 Mark**

A The time taken by a moving object. **B** The distance travelled by a moving object.
C The acceleration of a moving object. **D** The retardation of a moving object.

Q58. In a uniformly accelerated motion, the speed varies from 0 to 20m/ s in 4s. What is the average speed during the motion? **1 Mark**

A 10m/ s **B** 20m/ s **C** 0m/ s **D** 15m/ s

Q59. A graph of x versus t is shown in Fig. Choose correct alternatives from below: **1 Mark**

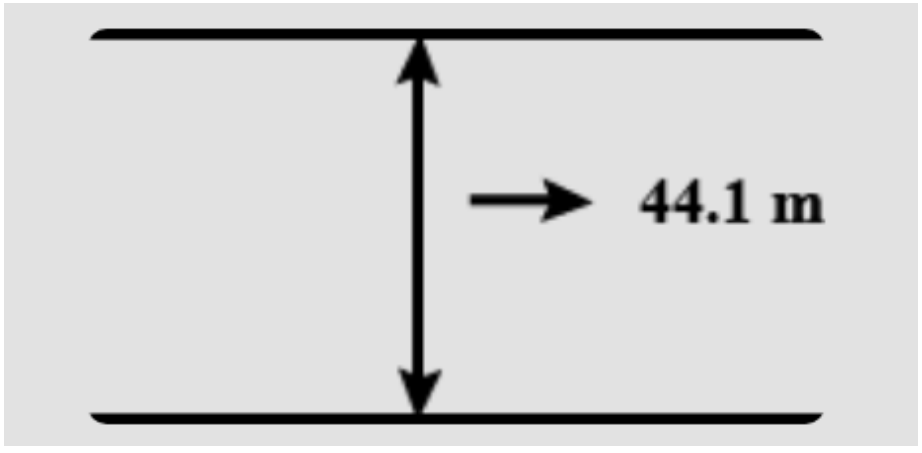


A The particle was released from rest at t = 0. **B** At B, the acceleration a > 0.
C At C, the velocity and the acceleration vanish.
D Average velocity for the motion between A and D is positive.
E The speed at D exceeds that at E.

Q60. How many variables are required to define the position of a body in space? **1 Mark**

A 3 **B** 2 **C** 1 **D** 0

Q61. A stone is dropped into the water from a bridge 44.1m above the water. another stone is thrown vertically downward 1second later. both strike the water simultaneously. then initial speed of the second stone is: **1 Mark**



A $24.5ms^{-1}$ **B** $4.9ms^{-1}$ **C** $9.8ms^{-1}$ **D** $12.25ms^{-1}$

Q62. Two cars OF SAME LENGTH move in the same direction along parallel roads. One of them is a 100m long travelling with a velocity of 7.5 ms−1. How long will it take for the first car to overtake the second car? **1 Mark**

A 26s **B** 40s **C** 60s **D** 80s

Q63. When a body is in the state of complete rest, what kind of energy does it possess? **1 Mark**

A Potential energy **B** Kinetic energy **C** Total energy **D** Heat energy

Q64. A car is moving in a spiral starting from the origin with uniform angular velocity. What can be said about the instantaneous velocity? **1 Mark**

A It increases with time **B** It decreases with time **C** It remains constant
D It does not depend on time

Q65. A bullet is fired from the cart vertically at the same instant cart begins to accelerate forward. Which of the following best describes the subsequent motion of the bullet? **1 Mark**

A The bullet goes up and then straight back down into the cart.
B The bullet goes up and lands in front of the cart.
C The bullet goes up and lands behind the cart.
D
The bullet stops in the air as the cart is accelerating and "floats" until the cart stops accelerating.
E The bullet goes up and to the right of the cart.

Q66. Which one of the following relations is true? **1 Mark**

A Distance > Displacement **B** Distance < Displacement **C** Distance >= Displacement
D Distance <= Displacement

Q67. An aeroplane is flying in a horizontal direction at 600km/ hr at a height of 6kms and is advancing towards a point which is exactly over a target on earth. At that instant the pilot releases a ball which on descending the earth strike the target. The falling ball appears- **1 Mark**

A To the pilot in the aeroplane, as falling along a parabolic path.
B To a person standing near the target, as falling exactly vertical.
C To a person standing near the target, as describing a parabolic path.
D To the pilot sitting in the aeroplane, as falling in a zigzag path.

Q68. A ball is bouncing elastically with a speed 1m/s between walls of a railway compartment of size 10m in a direction perpendicular to walls. The train is moving at a constant velocity of 10m/s parallel to the direction of motion of the ball. As seen from the ground: **1 Mark**

A The direction of motion of the ball changes every 10 seconds.
B Speed of ball changes every 10 seconds.
C Average speed of ball over any 20 second interval is fixed.
D The acceleration of ball is the same as from the train.

Q69. At a metro station, a girl walks up a stationary escalator in time t_1. If she remains stationary on the escalator, then the escalator take her up in time t_2. The time taken by her to walk up on the moving escalator will be: **1 Mark**

A $\frac{(t_1+t_2)}{2}$. **B** $\frac{t_1t_2}{(t_2-t)}$. **C** $\frac{t_1t_2}{(t_2+t_1)}$. **D** $t_1 - t_2$.

Q70. Mark the correct statements for a particle going on a straight line: **1 Mark**

A If the velocity and acceleration have opposite sign, the object is slowing down.
B If the position and velocity have opposite sign, the particle is moving towards the origin.
C If the velocity is zero at an instant, the acceleration should also be zero at that instant.
D
If the velocity is zero for a time interval, the acceleration is zero at any instant within the time interval.

Q71. In one dimensional motion, instantaneous speed v satisfies $0 \leq v < v_0$. **1 Mark**

A The displacement in time T must always take non-negative values.
B The displacement x in time T satisfies $v_0 T < x < v_0 T$.
C The acceleration is always a non-negative number. **D** The motion has no turning points.

Q72. When person moves in the coordinate system from A (0, 0) to B (5, 10), to C (8, 6), what is the displacement covered? **1 Mark**

A 10 units **B** 5 units **C** 7 units **D** 15 units

Q73. Consider the motion of the tip of the minute hand of a clock. In one hour: **1 Mark**

A The displacement is zero. **B** The distance covered is zero. **C** The average speed is zero.
D The average velocity is zero.

Q74. The trajectory of an object is defined as $x = (t - 4)^2$, what is the velocity at $t = 5$? **1 Mark**

A 2 **B** 5 **C** 1 **D** 4

Q75. Which of the following types of motion can be used for describing the motion of a car on a straight road? **1 Mark**

A Rectilinear **B** Circular **C** Periodic **D** Harmonic

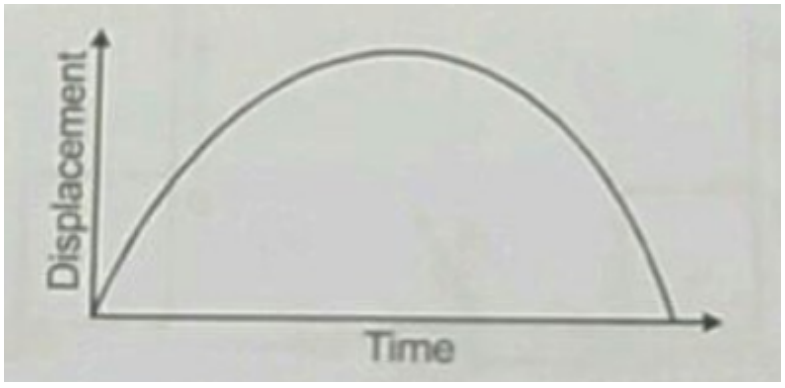
Q76. How long will a train, running at a speed of 45kmph cross a standing man, given the length of the train is 450m? **1 Mark**

A 100sec **B** 150sec **C** 50sec **D** 36sec

Q77. In which coordinate system do we use distance from origin and to angles to define the position of a point in space? **1 Mark**

A Cartesian **B** Cylindrical **C** Spherical **D** 2 - D Cartesian

Q78. The graph predicts the condition of: **1 Mark**

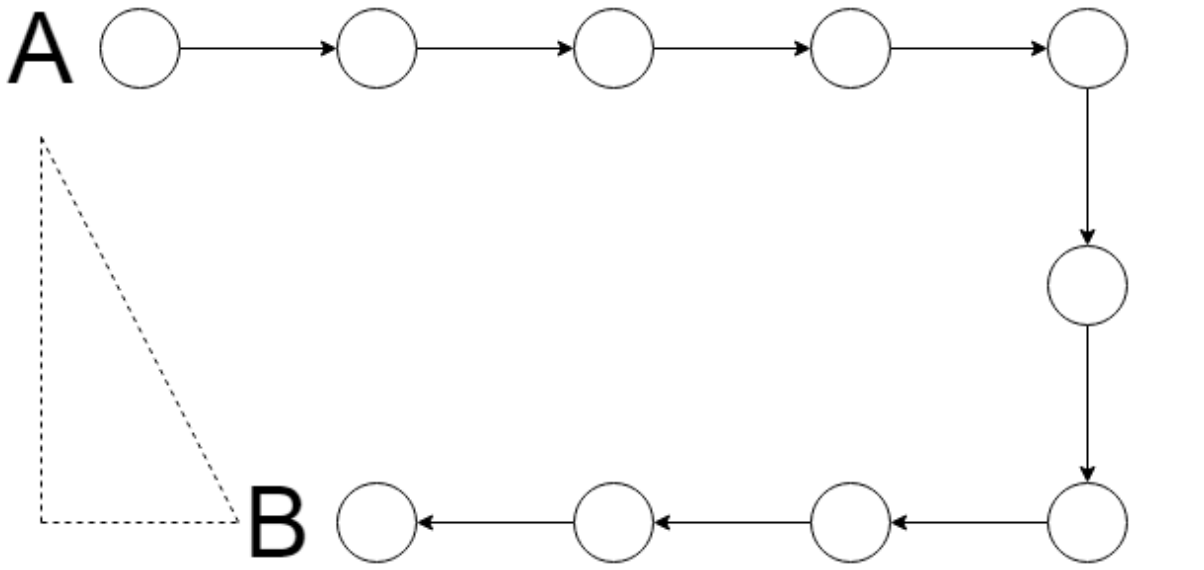


A Body is undergoing positive acceleration. **B** Body is undergoing negative acceleration.
C Uniform velocity. **D** Uniform speed.

Q79. According to the following graph, what happens to the distance covered by the body from 0 -10 minutes? **1 Mark**

A It goes on increasing **B** It goes on decreasing **C** It first increases and then decreases
D It first decreases and then increases

Q80. If, in the following diagram, distance between each circle is 1 unit, what is the displacement between A and B? **1 Mark**



A 5 units **B** Square root (5) units **C** 2 units
D 1 unit

Q81. Path length does not depend on ____. **1 Mark**

A Initial point **B** Final point **C** Path taken **D** Coordinate system

Q82. A stone is just released from the window of a moving train moving along a horizontal straight track. When observed by a person on the ground, the stone will hit the ground following a: **1 Mark**

A Straight line path **B** Circular path **C** Parabolic path **D** Hyperbolic path

Q83. The gradient of velocity v/s time graph is equal to _____. **1 Mark**

A Velocity **B** Acceleration **C** Distance **D** Momentum

Q84. A body thrown vertically up with a velocity 'u' reaches the maximum height 'h' after 'T' second. The correct statement among the following is: **1 Mark**

A At a height $\frac{h}{2}$ from the ground its velocity is $\frac{u}{2}$. **B** At a time T its velocity is 'u'.
C At a time '2T' its velocity is -u. **D** At a time 2T its velocity is -6u.

Q85. Among the four graphs Fig. there is only one graph for which average velocity over the time intervel (0, T) can vanish for a suitably chosen T. Which one is it? **1 Mark**

A **B** **C** **D**

Q86. A stone is released from a hot air balloon which is rising steadily with a velocity of $4ms^{-1}$. The velocity of the stone at the end of 3s after it is released is ____ ms^{-1} **1 Mark**

A 29.4 **B** 25.4 **C** 32.5 **D** 62.7

Q87. A man of mass 40kg is standing on a uniform plank of mass 60kg lying on horizontal frictionless ice. The man walks from one end to the other end of the plank. the distance walked by the man relative to ice is (given length of plank = 5m) **1 Mark**

A 2m **B** 3m **C** 5m **D** 4m

Q88. If the velocity varies parabolically, how does the acceleration vary? **1 Mark**

A Linearly **B** Hyperbolically **C** Parabolically **D** Elliptically

Q89. Displacement between two points is ___. **1 Mark**

A The shortest path **B** The longest path **C** Equal to distance
D Greater than distance

Q90. If the time of acceleration is t_1, then the speed of the car at $t = t_1$ is: **1 Mark**

A $2t_1$ **B** t_1 **C** $> 2t_1$ **D** $< 2t_1$

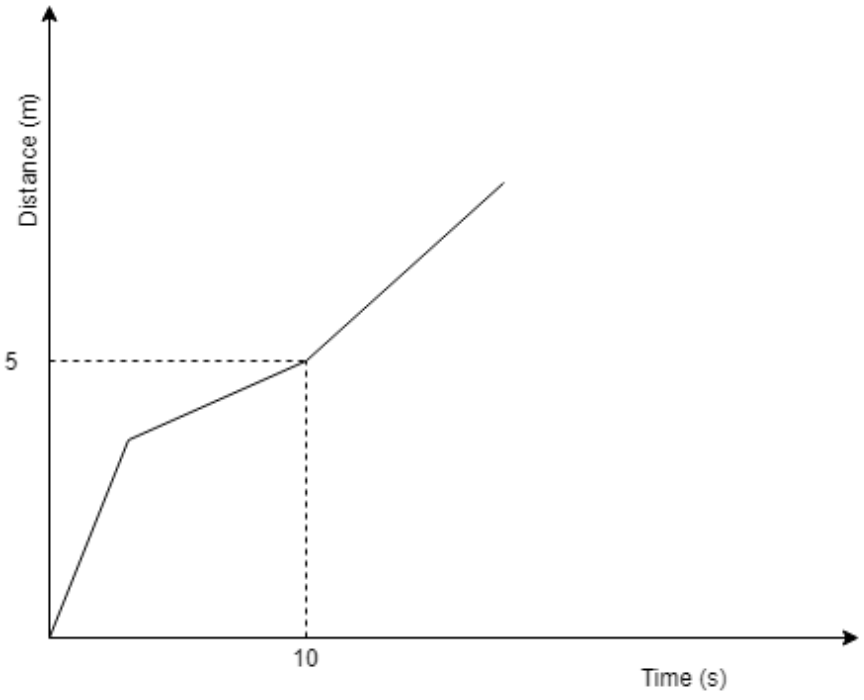
Q91. From a 200m high tower, one ball is thrown upwards with speed of 10m/ s and another is thrown vertically downwards at the same speed simultaneously. The time difference of their reaching the ground will be nearest to: **1 Mark**

A 12s **B** 6s **C** 2s **D** 1s

Q92. Distance does not depend on _____. **1 Mark**

A Initial point **B** Final point **C** Path taken **D** Speed

Q93. What is the velocity for a body following the graph below at 10s? **1 Mark**



A 1m/ s **B** 2m/ s **C** 0.5m/ s **D** 0.1m/ s

Q94. The velocity - time graph below represents the velocity of a toy train as it moves north and south with velocity near the middle of the vertical axis. During which, Interval(s) is the toy train speeding up? **1 Mark**

A 0 to A only **B** 0 to A and D to E **C** A to B **D** B to D only
E A to B and D to E

Q95. What will be the velocity v/s time graph of a ball falling from a height before hitting the ground look like? **1 Mark**

A A straight line with positive slope **B** A straight line with negative slope
C A straight line with zero slope **D** A parabola

Q96. The body will speed up if _____. **1 Mark**

A Velocity and acceleration are in same direction.
B Velocity and acceleration are in opposite direction.
C Velocity and acceleration are in perpendicular direction. **D** None of these.

Q97. A particle has a velocity u towards east at t = 0. Its acceleration is towards west and is constant. Let x_A and x_B be the magnitude of displacements in the first 10 seconds and the next 10 seconds: **1 Mark**

A $x_A < x_B$ **B** $x_A = x_B$ **C** $x_A > x_B$
D The information is insufficient to decide the relation of x_A with x_B.

Q98. A particle moves along the X-axis as $x = u(t - 2s) + a(t - 2s)^2$. **1 Mark**

A The initial velocity of the particle is u. **B** The accelerati?n of the particle is a.
C The acceleration of the particle is 2a. **D** At t = 2s particle is at the origin.

Q99. Newtons law are not valid in: **1 Mark**

A Both inertial as well as non - inertial frame of reference.
B A frame moving with constant velocity w.r.t. an inertial frame.
C All reference frames which are at rest w.r.t. an inertial frame.
D The reference frame attached to the earth.

Q100. An elevator is going down with a constant acceleration. A coin dropped from a point 1.8m above the elevator floor takes one second to reach the floor. The magnitude of the acceleration of the the elevator in ms^{-2} is: Given: g = $10ms^{-2}$ **1 Mark**

A 3.6 **B** 5 **C** 7.2 **D** 6.4