Exam Paper
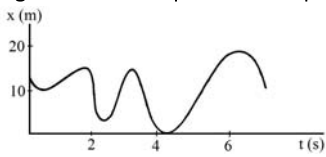.

Test / Exam Name: 2 Motion In A Straight Line Standard: 11th Science   Subject: Physics

Instructions

Q1. The time after which they are closest to each other: **1 Mark**

A $\frac{1}{35}$ **B** $\frac{8}{3}$s   **C** $\frac{1}{5}$s   **D** $\frac{8}{5}$s

Q2. 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

Q3. What kind of motion is rectilinear motion?   **1 Mark**

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

Q4. 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.

Q5. 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.

Q6. 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

Q7. 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

Q8. 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

Q9. 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

Q10. 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

Q11. 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.

Q12. 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

Q13. If the velocity of a body does not change, its acceleration is: **1 Mark**

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

Q14. 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 |

Q15. 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 |

Q16. 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 |

Q17. 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.

Q18. 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, |

Q19. 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 |

Q20. 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 |

Q21. 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 |

Q22. 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.

Q23. 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.

Q24. 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

Q25. 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 |

Q26. 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 |

Q27. 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.

Q28. 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.

Q29. The rate of change of velocity is: **1 Mark**

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

Q30. 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 = $10ms^{-2}$). **1 Mark**

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

Q31. 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

Q32. 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.

Q33. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: A body is momentarily at rest at the instant, if it reverse the direction.

Reason: A body cannot have acceleration, if its velocity is zero at a given instant of time.

A Both A and R are true and R is the correct explanation of A.

B Both A and R are true but R is not the correct explanation of A.

C A is true but R is false.

D A is false and R is also false.

Q34. 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

Q35. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: An object may have varying speed without having varying velocity.

Reason: If the velocity is zero at an instant, the acceleration is zero at that instant.

A Both A and R are true and R is the correct explanation of A.

B Both A and R are true but R is not the correct explanation of A.

C A is true but R is false.

D A is false and R is also false.

Q36. 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.

Q37. 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

Q38. 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.

Q39. 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 $2\sqrt{2}$

Q40. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: For motion along a straight line and in the same direction, the magnitude of average velocity is equal to the average speed.

Reason: For motion along a straight line and in the same direction, the magnitude of displacement is not equal to the path length.

A Both A and R are true and R is the correct explanation of A.

B Both A and R are true but R is not the correct explanation of A.

C A is true but R is false.

D A is false and R is also false.

Q41. 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

Q42. 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.

Q43. 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

Q44. 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

Q45. 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

Q46. 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

Q47. 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**
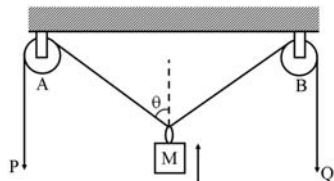
A $2u\cos\theta$ **B** $\frac{u}{\cos\theta}$

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

Q48. 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

Q49. 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.

Q50. 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

Q51. 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

Q52. 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

Q53. Figure shows the V−T graph for two particles P and Q. The relative velocity of P w.r.t. Q is: **1 Mark**
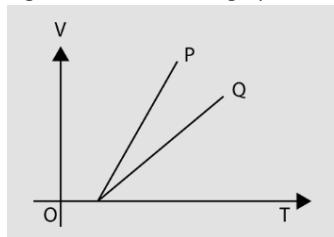
A Is zero.   **B** Is non-zero but constant

C Continuously decreases   **D** Continuously increases

Q54. A uniformly accelerated body has ____. **1 Mark**

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

Q55. 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

Q56. 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

Q57. For two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**

Assertion: In realistic situation, the x-t, v-t and a-t graphs will be smooth.

Reason: Physically acceleration and velocity cannot change values abruptly at an instant.

A Both A and R are true and R is the correct explanation of A.   **B** Both A and R are true but R is not the correct explanation of A.

C A is true but R is false.   **D** A is false and R is also false.

Q58. The variation of quantity A with quantity B, plotted in Fig. describes the motion of a particle in a straight line. **1 Mark**
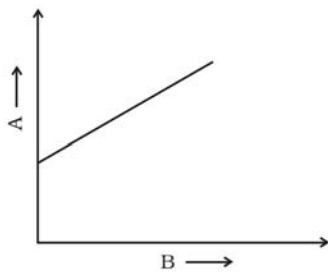
A Quantity B may represent time.   **B** Quantity A is velocity if motion is uniform.

C Quantity A is displacement if motion is uniform.   **D** Quantity A is velocity if motion is uniformly accelerated.

Q59. The changes in displacement in three consecutive instances are 5m, 4m, 11m, the total time taken is 5s. What is the average   **1 Mark**
velocity in m/ s?

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

Q60. 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