QB365

Important Questions - Motion

9th Standard CBSE

Science

Reg.No. : | | | | | | |

Time : 01:00:00 Hrs

Total Marks : 50

Section-A

1) The SIof velocity is **1**

(a) ms^{-1} (b) ms^{-2} (c) ms^{-3} (d) Nm^{-1}

2) A car goes from town A to another town B with a speed of 40 km/h and returns back to the town A with a speed of 60 km/h The average speed of the car during the complete journey is **1**

(a) 48 km/h (b) 50 km/h (c) zero (d) none of these

3) The initial velocity of a body is u.It is under uniform acceleration a its velocity v at any time t is given by **1**

(a) $v = u + at^2$ (b) $v = u + \frac{1}{2}at^2$ (c) v=u+at (d) v=u

4) The initial velocity of a train which is stopped in 20 s by applying brakes retardation due to brakes being 1.5 ms^{-2} is **1**

(a) 30 ms^{-2} (b) 30 cm^{-1} (c) 20 cm^{-1} (d) 24 ms^{-1}

5) A wooden slab starting from rest slides down a 10 m long inclined plane with an acceleration of 5 ms^{-2} what would be its speed at the bottom of the inclined plane? **1**

(a) 10 ms^{-1} (b) 12 ms^{-1} (c) 10 cms^{-1} (d) 12 cms^{-1}

6) A particle moves uniform positive acceleration its velocity-time graph will be **1**

(a) a straight line parallel to the time-axis (b) a straight line inclined at an obtuse angle to the time-axis

(c) a straight line inclined at an accute angle to the time -axis (d) none of the above

7) A particle experiences constant acceleration for 20 seconds after starting from rest If it travels a distance s_1 in the first 10 seconds and distance s_2 in the next 10 seconds then **1**

(a) $s_2 = s_1$ (b) $s_2 = 2s_1$ (c) $s_2 = 3s_1$ (d) $s_2 = 4s_1$

8) Figure 8.5 shows the velocity-time graph AB for a body the body has **1**

(a) uniform acceleration (b) uniform retardation

(c) uniform velocity throughout its motion and has zero initial velocity (d) none of these

9) The fig 8.39 shows how the speed of a marble changes as it rolls down an inclined plane A , travels on a flat horizontal surface and then on another inclined plane B Then the total time during which the marble is in motion is **1**

(a) 10s (b) 40s (c) 80s (d) 100s

10) In qusetion 32 the total distance travelled is **1**

(a) 400 m (b) 1200 m (c) 1800 m (d) 1300 m

Section-B

11) Give one example of uniformly accelerated motion? **2**

12) State the S.I unit of speed A girl moves with the speed of 6 km/h for 2 h and with the speed of 4 km/h for the next 3 h find the average speed of the girl and the total distance moved. **2**

13) Define the terms rest and motion Give one example for each. **2**

14) Show that rest and motion are relative terms. **2**

15) Can an object be at rest as well as in motion at the same time? **2**

16) What is meant by a point object? Give some examples **2**

17) Give some points of differences between distance and displacement **2**

18) Give two differences between distance and displacement **2**

19) What is the SI unit of displacement? **2**

20) What is meant by uniform motion? Give an example **2**

Section-C

21) State the SI unit of speed **20**

22) Define Uniform and non-uniform speeds. **20**

23) Define the term average speed. **20**

24) A scotter starts from rest moves in a straight line with a constant acceleration and covers a distance of 64 m in 4s. **20**

(i) Calculate its acceleration and its final velocity.

(ii) At what time the scooter had covered half the total distance?

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Section-A

1) (a) ms^{-1} **1**

2) (a) 48 km/h **1**

3) (c) v=u+at **1**

4) (a) 30 ms^{-2} **1**

5) (a) 10 ms^{-1} **1**

6) (c) a straight line inclined at an accute angle to the time -axis **1**

7) (a) $s_2 = s_1$ **1**

8) (d) none of these **1**

9) (d) 100s **1**

10) (d) 1300 m **1**

Section-B

11) **2**

12) SI unit of speed is meter per second. Average speed of the body is given by **2**

$v_{av} = \frac{v_1 t_1 + v_2 t_2}{t_1 + t_2}$

Here, v_1 = 6 km/h, t_1 =2 h, v_2 = 4 km/h, t_2 = 3 h

$v_{av} = \frac{6\times2+4\times3}{2+3}$ = 4.8 km/h

∴Total distance = $v_1 t_1 + v_2 t_2 = 6 \times 2 + 4 \times 3$= 24km

13) **2**

Rest .A body is said to be at rest if it does not change its position with respect to its surroundings.A table lying in a room is at rest with respect to the walls of the room.

Motion .A body is said to be in motion if it changes its position with respect to its surroundings Thus , motion means movement of bodies A car running on the road is in motion with respect to the lamp posts,trees or bus stop on the roadside.

14) **2**

An object may be at rest relative to one surrounding object and at the same time it may be in motion relative to some other object For example a passanger sitting in a moving train is at rest relative to other passengers of his compartment.But since he is sharing the motion of the train.so he is in motion relative to the outside trees, lamp posts railway stations etc Thus,rest and motion are relative terms.

15) **2**

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16) **2**

Point object Whenever the size of the object is much smaller than the distance it moves in a given time interval the size of the object can be neglected Then the object may be regarded as the point object.

Examples (i) A car covering a distance of 10 km can be treated as a point object

(ii) Earth can be regarded as a point object for studying its motion around the sun

17) **2**

Distance	**Displacement**
1.Distance is the length of the actual path traversed by a body irrespective of its direction of motion	1.Displacement is the shortest distance between the initial and final position of a body in a given direction.
2.Distance between two given points may be same or different for different paths chosen.	2.Displacement between two given points is always same
It is a scalar quantity	It is a vector quantity
Distance covered is always positive or zero	Displacement covered may be positive negative or zero.

18) **2**

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19) metre (m) **2**

20) **2**

Uniform motion.If an object covers equal distances in equal intervals of time, however small the time interval may be, said then the motion of the object said to be uniform motion.For example suppose a bus moves 10 km in the first 15 minutes ,10 km in second 15 minutes. 10 km in third 15 minutes and so on.Then one can say that the bus is in uniform motion.

Section-C

21) ms^{-1} **20**

22) **20**

Uniform speed. when an object covers equal distance in equal intervals of time. however small these intervals may be ,it is said to be in 'uniform speed' For example if we are driving a scooter at a uniform speed of 40 km per hour,then we will travel 20 km for every half hour, 10 km for every quarter of an hour and 0.6 km for every minute and 10 m for every second.

Non-uniform speed. When an object covers unequal distances in equal intervals of time, it is said to be in 'non uniform speed' for example when we start a scotter,we press its accelerator to increase its speed and at many places we supply brakes to slow down the scotter In such situations,the speed is non-uniform.

23) **20**

Average speed. When the speed of the body varies with time we need to define its average speed. Average speed is the total distance travelled by a body,divided by the total time taken to cover that distance Thus,

Average speed=$\frac{Total\quad distance\quad travelled}{Total\quad time\quad taken}$

For example,if a car travels a distance of 10 km in 2 hours, then its

Average speed=$\frac{100\quad km}{2\quad hour}$ = 50 km per hour.

24) a=8 ms^{-2},v=32 ms^{-1} (ii) t=$2\sqrt{2\quad s}$ **20**