Multiple Choice Questions

1. Which of the following cannot be used for measurement of time?
(a) A leaking tap.
(b) Simple pendulum.
(c) Shadow of an object during the day.
(d) Blinking of eyes.

Soln:

Answer is (d) Blinking of eyes.

Explanation:

Blinking of eye is not a periodic phenomenon. Eyes does not blink at a fixed interval of time. Hence Blinking of eyes cannot be used for measurement of time.

2. Two clocks A and B are shown in Figure 13.1. Clock A has an hour and a minute hand, whereas clock B has an hour hand, minute hand as well as a second hand. Which of the following statement is correct for these clocks?

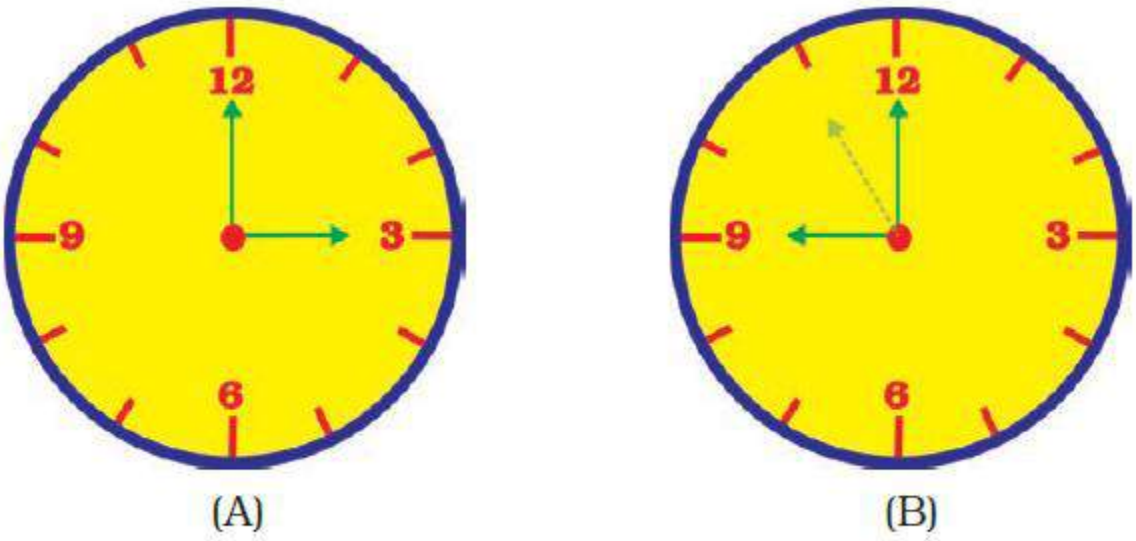


Fig 13.1

(a) A time interval of 30 seconds can be measured by clock A.
(b) A time interval of 30 seconds cannot be measured by clock B.
(c) Time interval of 5 minutes can be measured by both A and B.
(d) Time interval of 4 minutes 10 seconds can be measured by clock A.

Soln:

Answer is (c) Time interval of 5 minutes can be measured by both A and B.

Explanation:

Clock A doesn't have seconds hand. Hence seconds cannot be measured by clock A. 5 minutes can be measured by using both the clocks.

3. Two students were asked to plot a distance-time graph for the motion described by Table A and Table B.

Table A

Distance moved (m)	0	10	20	30	40	50
Time (minutes)	0	2	4	6	8	10

Table B

Distance moved (m)	0	5	10	15	20	25
Time (minutes)	0	1	2	3	4	5

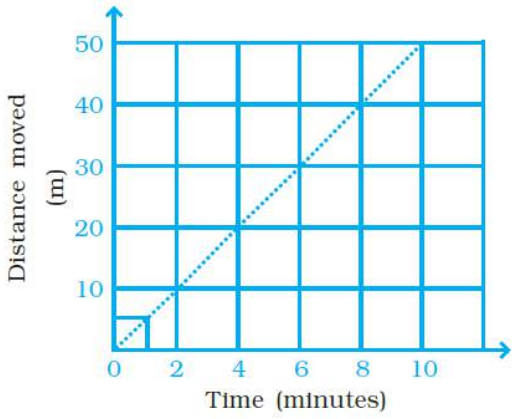


Fig 13.2

The graph given in Figure 13.2 is true for
(a) both A and B.
(b) A only.
(c) B only.
(d) neither A nor B.

Soln:

Answer is (b) A only.

Explanation:

Speed of A and B is constant hence A and B will be in a straight line in a graph.

4. A bus travels 54 km in 90 minutes. The speed of the bus is
(a) 0.6 m/s
(b) 10 m/s
(c) 5.4 m/s
(d) 3.6 m/s

Soln:

Answer is (b) 10 m/s

Explanation:

Speed = Distance / Time
Distance = 54km = 54 x1000 = 54000m
Time = 90 minutes = 90x60= 5400s

Speed = 54000/5400 = 10 m/s

5. If we denote speed by S, distance by D and time by T, the relationship between these quantities is

(a) S = D × T
(b) T = S/D
(c) S = 1/SxD
(c) S = T/D

Soln:

Answer is (c) S = 1/SxD

Explanation:

Option c) is the correction equation because Speed = Distance/Time

6. Observe Figure 13.3.

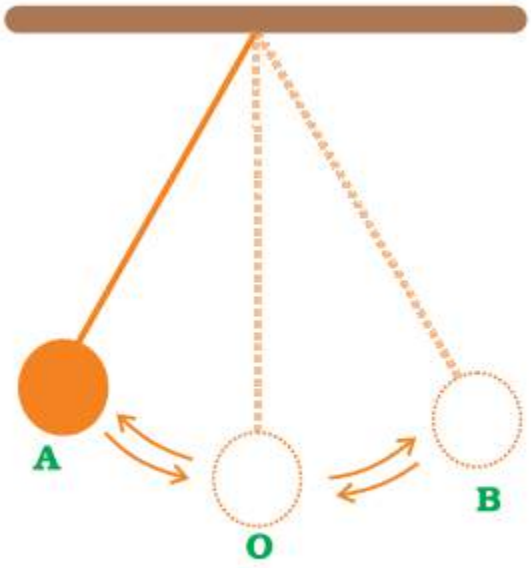


Fig 13.3

The time period of a simple pendulum is the time taken by it to travel from
(a) A to B and back to A.
(b) O to A, A to B and B to A.
(c) B to A, A to B and B to O.
(d) A to B.

Soln:

Answer is (a) A to B and back to A.

7. Fig. 13.4 shows an oscillating pendulum

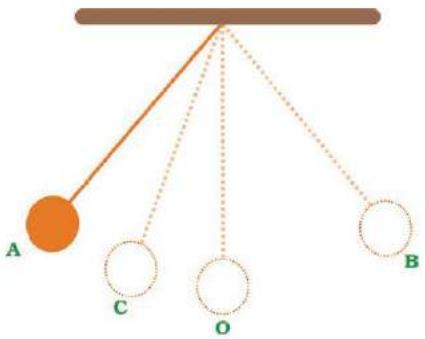


Fig. 13.4

Time taken by the bob to move from A to C is t1 and from C to O is t2. The time period of this simple pendulum is
(a) (t1 + t2)
(b) 2 (t1 + t 2)
(c) 3 (t1 + t 2)
(d) 4 (t1 + t 2)

Soln:

Answer is (d) 4 (t1 + t 2)

Explanation:

The total time taken by the bob to move from A to 0 is (t1+ t2) which is 1/4th time of one full cycle of pendulum. Time period of pendulum i.e. time taken by pendulum to complete one oscillation from A to B and back to A will be 4 (t1 + t2).

8. The correct symbol to represent the speed of an object is
(a) 5 m/s
(b) 5 mp
(c) 5 m/s-1
(d) 5 s/m

Soln:

Answer is (a) 5 m/s

Explanation:

Unit of speed is meter/ second hence the answer is (a) 5 m/s .

9. Boojho walks to his school which is at a distance of 3 km from his home in 30 minutes. On reaching he finds that the school is closed and comes back by a bicycle with his friend and reaches home in 20 minutes. His average speed in km/h is
(a) 8.3
(b) 7.2
(c) 5
(d) 3.6

Soln:

Answer is (b) 7.2

Explanation:

Average Speed = $\frac{Total\ Distance}{Total\ Time\ taken}$

$\frac{6}{50} x60$

=7.2 km/h (∵ 1h = 60 mins)

Very Short Answer Questions

10. A simple pendulum is oscillating between two points A and B as shown in Figure 13.5. Is the motion of the bob uniform or non-uniform?

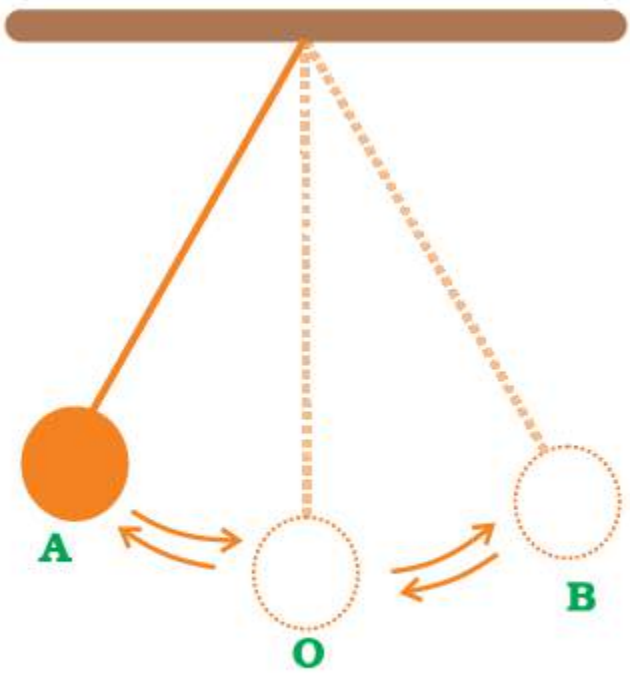


Fig. 13.5

Soln:

Motion of the bob is non-uniform because speed of the bob keeps changing.

12. Paheli and Boojho have to cover different distances to reach their school but they take the same time to reach the school. What can you say about their speed?

Soln:

Because their speed will be different from one another.

12. If Boojho covers a certain distance in one hour and Paheli covers the same distance in two hours, who travels in a higher speed?

Soln:

Boojho travels in a higher speed, hence he reaches the distance early.

Short Answer Questions

13. Complete the data of the table given below with the help of the distance-time graph given in Figure 13.6.

Distance (m)	0	4	?	12	?	20
Time (s)	0	2	4	?	8	10

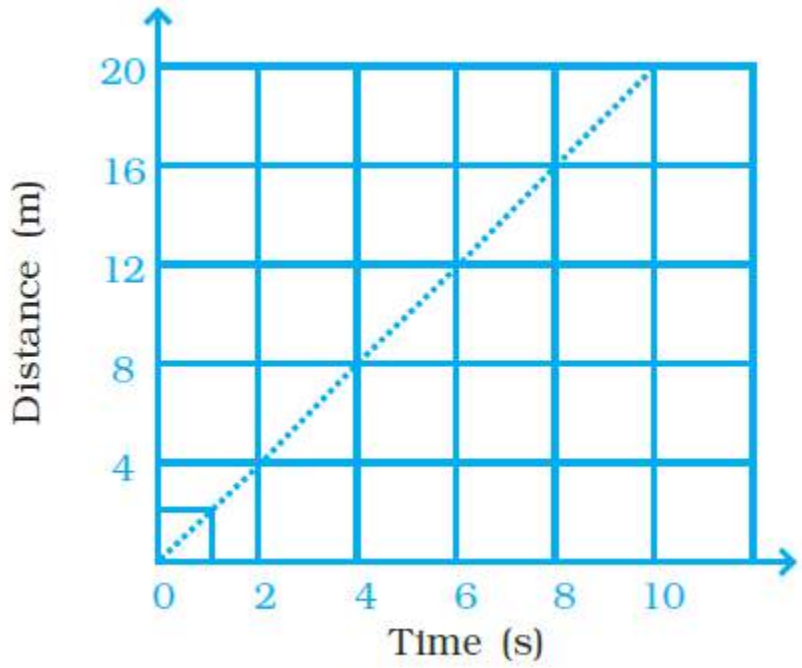


Fig. 13.6

Soln:

Distance (m)	0	4	8	12	16	20
Time (s)	0	2	4	6	8	10

14. The average age of children of Class VII is 12 years and 3 months. Express this age in seconds.

Soln:

12 years 3 months
= 12 × 365 + 3 × 30 = 4470 days
= 4470 × 24 × 60 × 60 s = 386208000 s

15. A spaceship travels 36,000 km in one hour. Express its speed in km/s.

Soln:

36000 km/h= $\frac{36000}{60x60}$ = 10 km/s

16. Starting from A, Paheli moves along a rectangular path ABCD as shown in Figure 13.7. She takes 2 minutes to travel each side. Plot a distance-time graph and explain whether the motion is uniform or non-uniform.

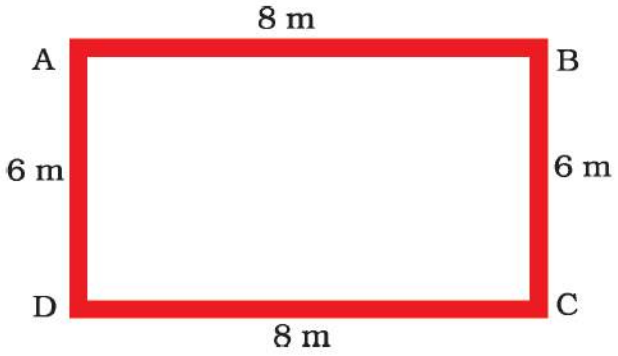
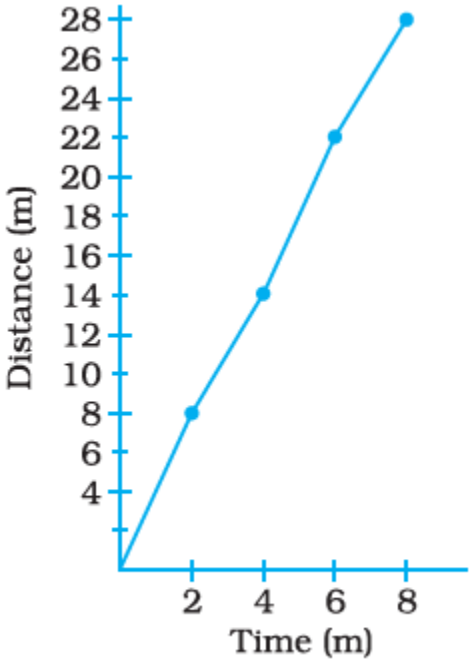


Fig 13.7

Soln:

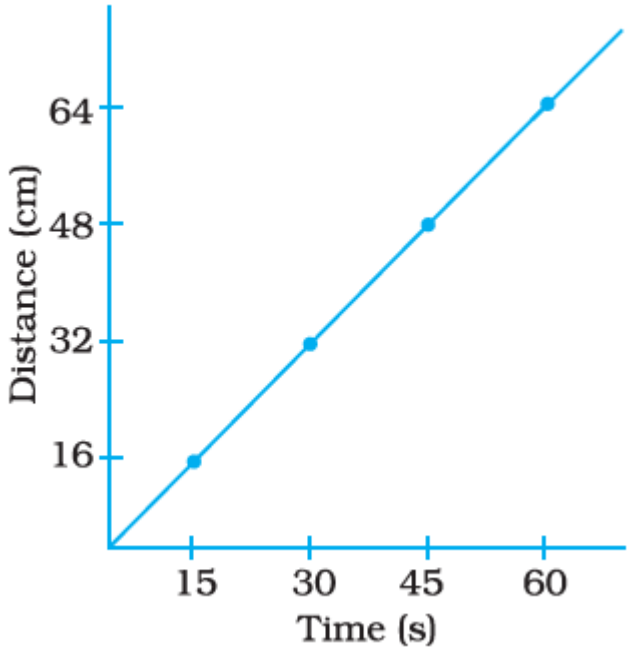
Since the distance covered per unit time for the entire distance covered is not the same, the motion is non-uniform.



17. Plot a distance-time graph of the tip of the second hand of a clock by selecting 4 points on x-axis and y-axis respectively. The circumference of the circle traced by the second hand is 64 cm.

Soln:

Time (s)	x	15	30	45	60
Distance (cm)	y	16	32	48	64



Long Answer Questions

18. Given below as Figure 13.8 is the distance-time graph of the motion an object.

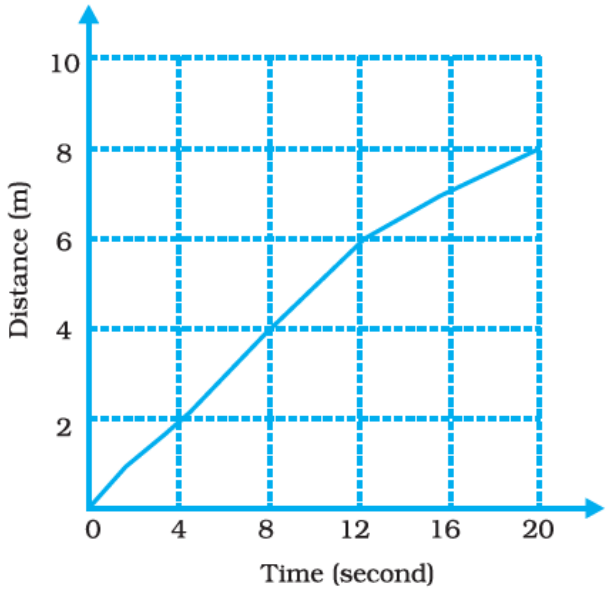


Fig. 13.8

(i) What will be the position of the object at 20s?
(ii) What will be the distance travelled by the object in 12s?
(iii) What is the average speed of the object?

Soln:

(i) At 20 s, the object will be 8 m away from the starting point.
(ii) In 12 s, distance travelled by the object will be 6 m.
(iii) Average speed of the object Total distance=Total distance/Time taken=8m/20s=0.4m/s

19.Distance between Bholu's and Golu's house is 9 km. Bholu has to attend Golu's birthday party at 7 o'clock. He started from his home at 6 o'clock on his bicycle and covered a distance of 6 km in 40 minutes. At that point he met Chintu and he spoke to him for 5 minutes and reached Golu's birthday party at 7 o'clock. With what speed did he cover the second part of the journey? Calculate his average speed for the entire journey.

The speed with which Bholu covered the second part of the journey

Soln:

$$= \frac{\text{Distance left to reach Golu's house}}{\text{Time left}}$$

$$= \frac{9\text{ km} - 6\text{ km}}{(1\text{ hour} - 45\text{ min})} = \frac{3\text{ km}}{1/4\text{ h}} = 12\text{ km/h}$$

$$\text{Average speed} = \frac{\text{Total distance travelled}}{\text{Total time taken}} = \frac{9\text{ km}}{1\text{ h}} = 9\text{ km/h}$$

20. Boojho goes to the football ground to play football. The distancetime graph of his journey from his home to the ground is given as Figure 13.9.

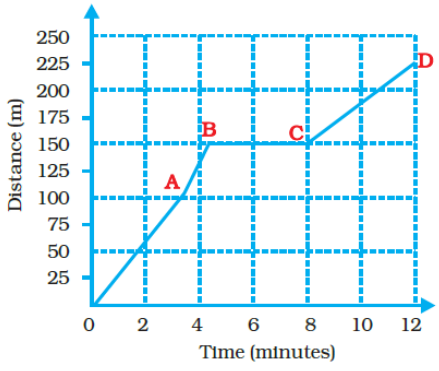


Fig. 13.9

(a) What does the graph between point B and C indicate about the motion of Boojho?
(b) Is the motion between 0 to 4 minutes uniform or nonuniform?
(c) What is his speed between 8 and 12 minutes of his journey?

Soln:

(a) Boojho's speed is zero hence he will be in rest
(b) motion between 0 to 4 minutes will be nonuniform
(c) $\frac{75}{4}$=18.75 m/minute