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# MOTION AND TIME

Chapter: 13th



SCIENCE
CLASS: 7TH
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# Chapter: 13
# Motion and Time

**Q1: Classify the following as motion along a straight line, circular or oscillatory motion:**

**(i) Motion of your hands while running.**
**(ii) Motion of a horse pulling a cart on a straight road.**
**(iii) Motion of a child in a merry-go-round.**
**(iv) Motion of a child on a see-saw.**
**(v) Motion of the hammer of an electric bell.**
**(vi) Motion of a train on a straight bridge.**

**Ans:**

(i) Oscillatory motion
(ii) straight line motion
(iii) Circular motion
(iv) Oscillatory motion
(v) Oscillatory motion
(vi) straight line motion

**Q2: Which of the following are not correct?**

**(i) The basic unit of time is second.**
**(ii) Every object moves with a constant speed.**
**(iii) Distances between two cities are measured in kilometres.**
**(iv) The time period of a given pendulum is constant.**
**(v) The speed of a train is expressed in m/h.**

**Ans:**

(i) Correct
(ii) Not correct
(iii) Correct
(iv) Not Correct
(v) Not correct

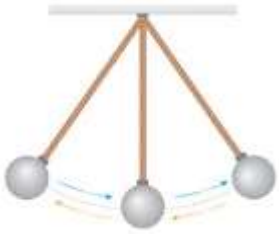
**Q3: A simple pendulum takes 32 s to complete 20 oscillations. What is the time period of the pendulum?**

**Ans:** Number of oscillations = 20

Time taken = 32 seconds

Time Period = $\frac{Total\ time}{number\ of\ oscillation} = \frac{20}{32} = 1.6\ seconds$

Therefore, the time period of the pendulum is 1.6 seconds.



**Q4: The distance between two stations is 240 km. A train takes 4 hours to cover this distance. Calculate the speed of the train.**

**Ans:** Distance between two stations is **240 km**

Time taken: - **4 hours**

Speed **= distance/time**

$= \frac{240}{4} = 60\ km/h$

Speed of the train is 60 km/h.

**Q5: The odometer of a car reads 57321.0 km when the clock shows the time 08:30 AM. What is the distance moved by the car, if at 08:50 AM, the odometer reading has changed to 57336.0 km? Calculate the speed of the car in km/min during this time. Express the speed in km/h also.**

**Ans:** Initial reading: - 57321 km

Final reading: - 57336 km

Distance covered by car = 57336 – 57321 = 15 km

Time taken by the car (8:50 – 8:30) = 20 min.

Speed = $\frac{Distance\ covered}{time\ taken} = \frac{15}{20} = 0.75\ km/min$

Speed = 0.75 X 60 = 45 km/h

**Q6: Salma takes 15 minutes from her house to reach her school on a bicycle. If the bicycle has a speed of 2 m/s, calculate the distance between her house and the school.**

**Ans:** Speed of the bicycle = 2m/s

Time taken by salma = 15 min. = 15 x 60 = 900 second.

Distance = speed X time

Distance = 2 X 900 = 1800 meters.

$= \frac{1800}{1000} = 1.8\ km$

The distance between her house and school is 1.8 km.

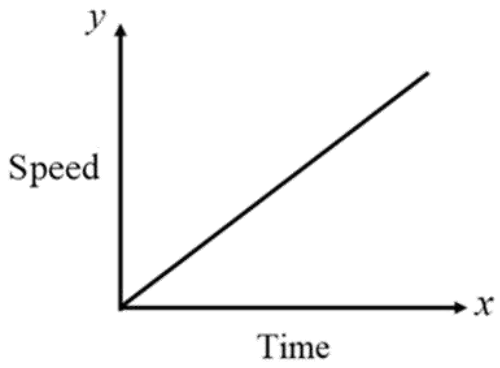

**Q7: Show the shape of the distance-time graph for the motion in the following cases:**

**(i) A car moving with a constant speed.**

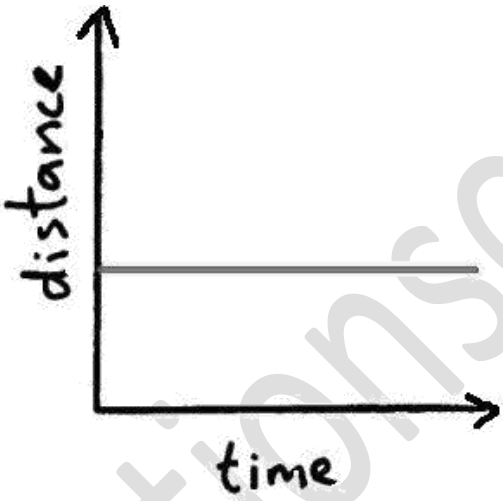
**(ii) A car parked on a side road.**

**Ans:**

**(i)**




**(ii)**




**Q8: Which of the following relations is correct?**

**(i)** $Speed = Distance \times Time$

**(ii)** $speed = \frac{distance}{time}$

**(iii)** $speed = \frac{time}{distance}$

**(iv)** $speed = \frac{1}{distnace\ X\ time}$

**Ans:** (ii) **speed=distance/time**

**Q9: The basic unit of speed is:**

**(i) km/min**

**(ii) m/min**

**(iii) km/h**

**(iv) m/s**

**Ans: (iv) m/s**

**Q10: A car moves with a speed of 40 km/h for 15 minutes and then with a speed of 60 km/h for the next 15 minutes. The total distance covered by the car is:**

**(i) 100 km**
**(ii) 25 km**
**(iii) 15 km**
**(iv) 10 km**

**Ans:** (ii) 25 km

**Q11: Suppose the two photographs, shown in Fig. 13.1 and Fig. 13.2, had been taken at an interval of 10 seconds. If a distance of 100 metres is shown by 1 cm in these photographs, calculate the speed of the fastest car.**

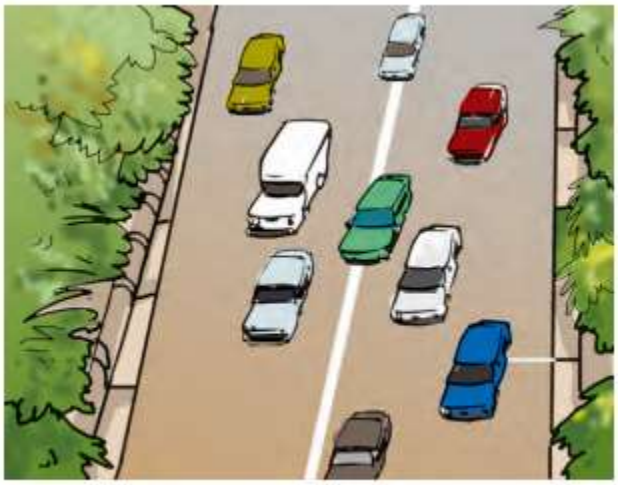
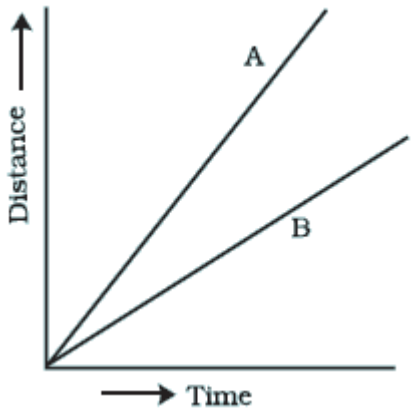


***Fig. 13.1*** *Vehicles moving in the same direction on a road*

***Fig. 13.2*** *Position of vehicles shown in Fig. 13.1 after some time*

**Ans:**

**Q12: Given Fig. shows the distance-time graph for the motion of two vehicles A and B. Which one of them is moving faster?**

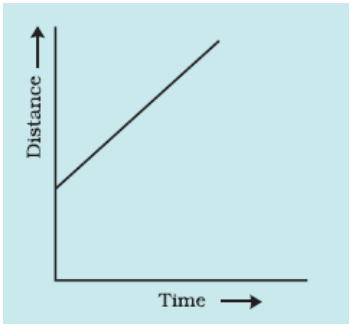



**Distance-time graph for the motion of two cars**

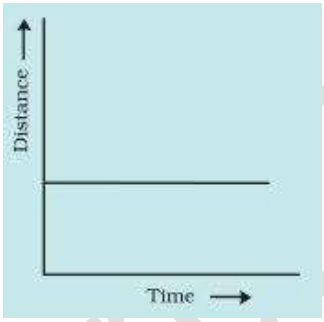
**Ans:** Vehicle A is moving faster that vehicle B. because Vehicle A covers more distance in less time.

**Q13: Which of the following distance-time graphs shows a truck moving with speed which is not constant?**

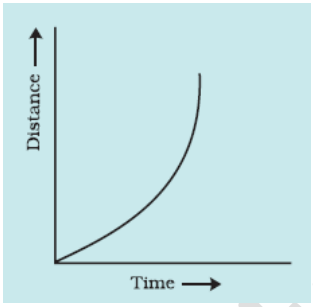
**(i)**



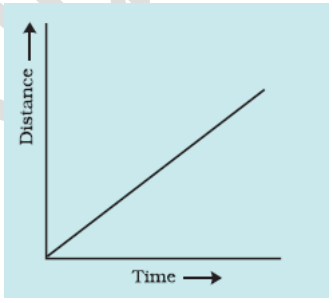

**(ii)**



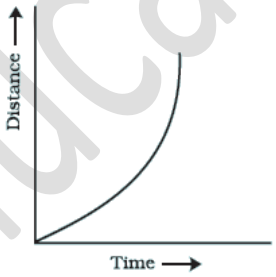

**(iii)**




**(iv)**




**Ans(iii)**



# Key Words

(i) **Bar graph:** Visual representation of data using rectangular bars.

(ii) **Graphs:** Visual tools to display relationships and patterns in data.

(iii) **Non-uniform motion:** Motion with changing speed or direction.

(iv) **Oscillation:** Repetitive back-and-forth motion around an equilibrium.

(v) **Simple pendulum:** Weight suspended from a fixed point, swinging back and forth.

(vi) **Speed:** Rate of change of distance with respect to time.

(vii) **Time period:** Time taken to complete one full cycle of motion.

(viii) **Uniform motion:** Motion with equal distances covered in equal time intervals.

(ix) **Unit of time:** Standard measurement used to quantify durations.