INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VII	**DEPARTMENT: SCIENCE 2023-2024**	**DATE OF COMPLETION: 31/08/2023**
TEXTBOOK- Q & A	**CHAPTER 13: MOTION AND TIME**	**Note: A4 FILE FORMAT**
NAME OF THE STUDENT :	**CLASS & SEC:**	**ROLL NO:**

1. Classify the following as motion along a straight line, circular or oscillatory motion:

(i) Motion of your hands while running. **– oscillatory motion**

(ii) Motion of a horse pulling a cart on a straight road. - **Motion along a straight line**

(iii) Motion of a child in a merry-go-round. **- Circular motion**

(iv) Motion of a child on a see-saw. - **Oscillatory motion**

(v) Motion of the hammer of an electric bell. - **Oscillatory motion**

(vi) Motion of a train on a straight bridge. - **Motion along a straight line**

2. Which of the following is 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. Incorrect statements are: (ii) and (v)

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

Ans. Number of oscillations = 20

Total time taken to complete 20 oscillations = 32 s

Time period = Total time taken / Number of oscillations = 32 / 20 = 1.6 s

4. The distance between the 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 = 240 km

Total time take = 4 h

Speed = Distance / Time = 240 / 4 = 60 km/h

5. 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 of the odometer = 57321.0

The final reading of the odometer = 57336.0

Distance covered by the car = Final reading of the odometer – Initial reading of the odometer

= 57336.0 – 57321.0 = 15 km

Starting time of the car is 8:30 am and it stops at 8:50

am Hence, time taken by the car = 20 min.

a) Speed = Distance / Time = 15/20 = 0.75 km/min

b) 20 min = 1/60 x 20 = 1/3 h

Speed = Distance / Time = 15÷ 1/3 = 15 x 3/1 = 45 km/h

6. 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. Time taken by Salma to reach her school by bicycle = 15 mins= 15 x 60 = 900 s

Speed of Salma's bicycle= 2m/s

Speed = Distance / Time

Distance covered = speed x time taken = 2 x 900 = 1800 m

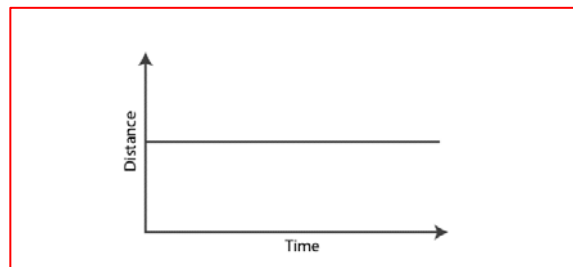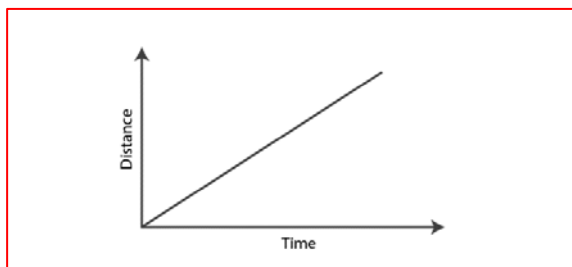**We know, 1000m = 1 km**

So, 1800m = 1/1000 x 1800 = 1.8 km.

7. 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.

8. Which of the following relations is correct?

(i) Speed = Distance × Time   (ii) Speed = Distance/Time

(iii) Speed = Time/Distance   (iv) Speed = 1/Distance x Time

Ans. (ii) Speed = Distance/Time

9. The basic unit of speed is:

(i) km/min   (ii) m/min   (iii) km/h   (iv) m/s

Ans. (iv) m/s

10. A car moves at 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

Calculation: When the speed of the car is 40 km/h-

Time taken = 15 min = 15/60 = 0.25 h

Speed = Distance/Time

Distance covered = speed x time taken

**   = 40 x 0.25 = 10 km**

When the speed of the car is 60 km/h

**   Speed = Distance/Time**

Distance covered = speed x time taken

**   = 60 x 0.25= 15 km**

Total distance covered by the car = 10 + 15 = 25 km.

11. 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.

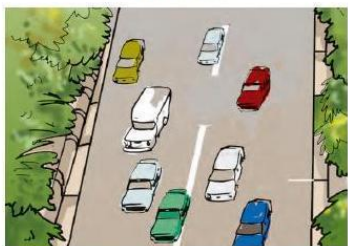*Fig. 13.1 Vehicles moving in the same direction on a road*

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

Ans. As we can see from the given figure the green car is the fastest car as it overtakes the white car and is very close to the blue car (initially green car was far behind the blue car). To calculate the speed of the fastest car i.e. green car, we have to measure using the scale The distance travelled by the green car, which is measured by scale is 3 cm. Therefore, 3 cm is equivalent to 300 m. Distance travelled by car = 300 m The time interval between the two photographs = 10 s Speed=Distance covered/Time taken =300/10=30 m/s Speed=Distance covered/Time taken =300/10=30 m/s So, the speed of the fastest car is 30 m/s
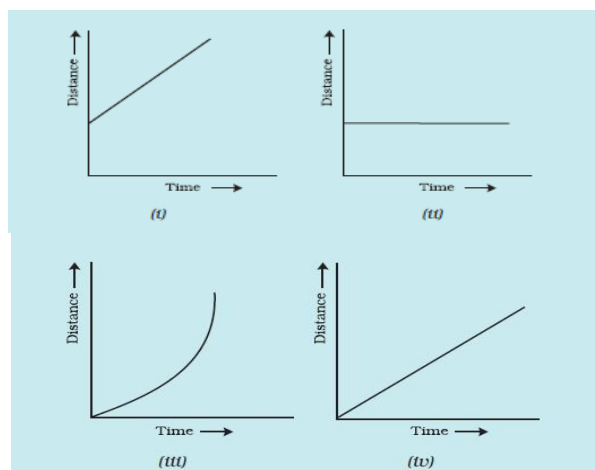
12. Fig. 13.15 shows the distance-time graph for the motion of two vehicles A and B. Which one of them is moving faster?

Fig. 13.15 Distance-time graph for the motion of two cars
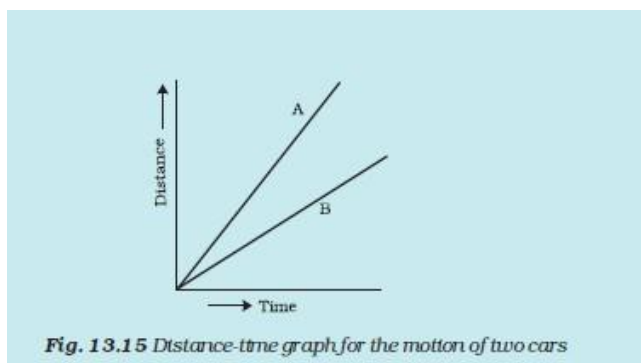
Ans. Vehicle A is moving faster than vehicle B. The Greater the slope of the distance-time graph, the higher the speed.

13. Which of the following distance-time graphs shows a truck moving with a speed which is not constant?

Ans. iii)

PREPARED BY:	CHECKED BY:
MS. SUMA SENU	HOD SCIENCE & FRENCH