

QUESTION AND ANSWERS

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

Solution :

Time taken = 32 s

No of oscillations = 20

Time period = ?

Time period = time taken/ no of oscillations

$$= 32 / 20$$

$$= 16/10$$

Time period = 1.6 s

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

Solution:

Distance = 240 km

Time = 4 h

Speed = distance / time = 240 km/4 h = 60 km/h

Speed = 60 km/h

3. 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.

Solution :

Reading 1 = 57321.0 km

Time 1 = 8: 30 am

Reading 2 = 57336.0 km

Time 2 = 8: 50 am

- (i) Distance travelled by the car = (57336.0 – 57321.0) km

Distance = 15 km

- (ii) Time taken = 8:50 am – 8:30 am = 20 minutes
Speed of the car = distance travelled / time taken

= 15 km/20 min

Speed = $\frac{3}{4}$ km/min

- (iii) Speed in km/h = ?

1 min = 1/60 h

$$\text{Therefore, speed} = \frac{15 \text{ km}}{20 \text{ min}} = \frac{15 \text{ km}}{\frac{20}{60} \text{ h}} = \frac{15 \text{ km}}{\frac{1}{3} \text{ h}}$$

Speed = 15 x 3 km/h = 45 km/h

4. 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.

Solution :

Time : 15 minutes

Speed of the bicycle = 2 m/s

Distance = ?

Distance covered in one second = 2m

Hence distance covered in 15 minutes = $2 \times 15 \times 60$

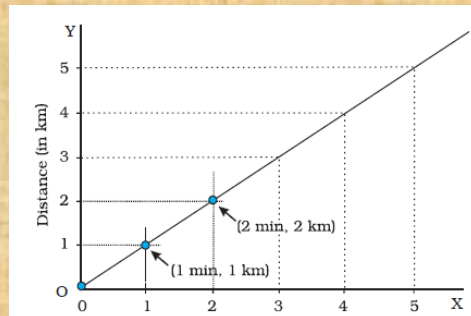
Distance between Salma's house and school is = 180m

5. Show the shape of the distance-time graph for the motion in the following cases:

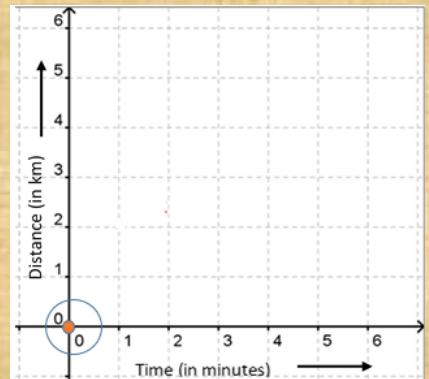
- (i) A car moving with a constant speed.
- (ii) A car parked on a side road.

Solution:

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



Case (ii) Car parked on the road side

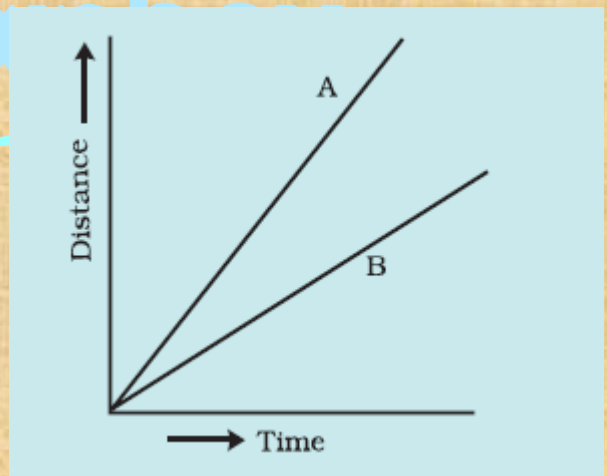


6. In the following figure shows the distance-time graph for the motion of two vehicles A and B. Which one of them is moving faster?

Answer:

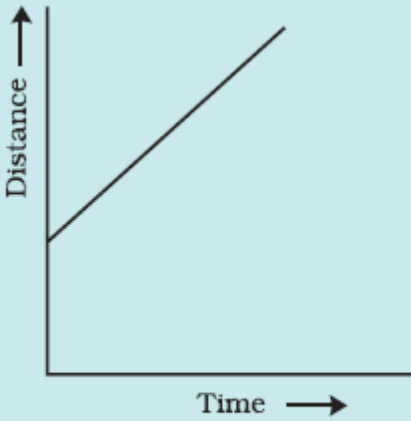
In the graph, at any instant of time, the distance covered by car A is more than the distance covered by car B.

Hence Car A is travelling at a greater speed than car B and therefore moving faster.

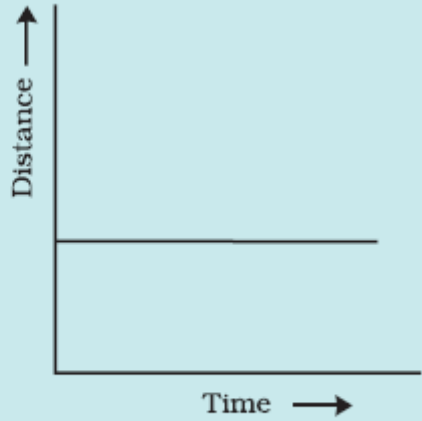


7. Which of the following distance-time graphs shows a truck moving with speed which is not constant?

Answer : The first graph is a straight line graph hence the truck is moving with a constant speed. In the second graph, though the truck has moved a certain distance, after some time the truck has stopped and not moving.



(i)



(ii)

