

EXERCISE 17(B)

Question 1.

A train 180 m long is running at a speed of 90 km/h. How long will it take to pass a railway signal?

Solution:

Distance = 180 m

Speed = 90 km/h

$$\begin{aligned}\therefore \text{Time taken} &= \frac{180}{90 \times 1000} \text{ hrs} \\ &= \frac{1 \times 60 \times 60}{500} = \frac{36}{5} = 7.2 \text{ seconds}\end{aligned}$$

Question 2.

A train whose length is 150 m, passes a telegraph pole in 10 sec. Find the speed of the train in km/h.

Solution:

Distance = 150 m

Time taken = 10 sec

$$\begin{aligned}\therefore \text{Speed} &= \frac{150}{10} = 15 \text{ m/s} \\ &= \frac{15 \times 60 \times 60}{1000} \text{ km/h} = 54 \text{ km/h}\end{aligned}$$

Question 3.

A train 120 m long passes a railway platform 160 m long in 14 sec. How long will it take to pass another platform which is 100 m long?

Solution:

Distance covered = 120 m + 160 m = 280 m

Time taken = 14 seconds

$$\therefore \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$= \frac{280}{14} = 20 \text{ m/s}$$

In seconds case, distance

$$= 120 + 100 = 220 \text{ m}$$

$$\therefore \text{Time taken} = \frac{220}{20} \text{ sec} = 11 \text{ sec}$$

Question 4.

Mr. Amit can walk 8 km in 1 hour 20 minutes.

(a) How far does he go in :

- (i) 10 minutes ?
- (ii) 30 seconds ?

(b) How long will it take him to walk :

- (i) 2500 m ?
- (ii) 6.5 km ?

Solution:

Amit walks 8 km in 1 hour 20 min

$$\text{or } 1 \frac{1}{3} = \frac{4}{3} \text{ hours}$$

$$\therefore \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$= \frac{8}{\frac{4}{3}} = \frac{8 \times 3}{4} = 6 \text{ km/h}$$

(a) (i) Distance covered in 10 minutes

$$= \frac{6 \times 1000 \times 10}{60} = 1000 \text{ m} = 1 \text{ km}$$

(ii) Distance covered in 30 seconds

$$= \frac{6 \times 1000 \times 30}{60 \times 60} = 50 \text{ m}$$

(b) (i) Time taken in 2500 m = $\frac{2500}{1000 \times 6}$

$$= \frac{5}{12} \text{ hours} = \frac{5}{12} \times 60 = 25 \text{ minutes}$$

(ii) Time taken in 6.5 km

$$= \frac{6.5}{6} = \frac{65}{60} \text{ hours}$$

$$= 1 \text{ hour } 5 \text{ minutes}$$

Question 5.

Which is greater : a speed of 45 km/h or a speed of 12.25 m/sec?

How much is the distance travelled by each in 2 seconds?

Solution:

First speed = 45 km/h

$$\text{Second} = 12.25 \text{ m/sec}$$

$$= \frac{12.25 \times 60 \times 60}{1000} \text{ km/h}$$

$$= \frac{1225 \times 60 \times 60}{100 \times 1000}$$

$$= \frac{441}{10} = 44.1 \text{ km/h}$$

It is clear from above that 45 km/h is greater.

Distance covered in 2 seconds by 45 km/h

$$\text{Speed} = \frac{45 \times 1000 \times 2}{60 \times 60} = 25 \text{ m}$$

and distance covered in 2 seconds by 12.25 m/sec = $12.25 \times 2 = 24.50$

Question 6.

A and B start from the same point and at the same time with speeds 15 km/h and 12 km/h respectively, find the distance between A and B after 6 hours if both move in :

- (i) same direction
- (ii) the opposite directions.

Solution:

A's speed = 15 km/h

B's speed = 12 km/h

Distance covered by A in 6 hours = $15 \times 6 = 90 \text{ km}$

and Distance covered by B in 6 hours = $12 \times 6 = 72 \text{ km}$

(i) Distance between A and B when they move in the same direction = $90 - 72 = 18 \text{ km}$

(ii) Distance between A and B, when they move in the opposite directions = $90 + 72 = 162 \text{ km}$

Question 7.

A and B start from the same place, in the same direction and at the same time with speeds 6 km/h and 2 m/sec respectively. After 5 hours who will be ahead and by how much?

Solution:

A's speed = 6 km/h

B's speed = 2 m/sec

Distance covered by A in 5 hours = $6 \times 5 = 30 \text{ km}$

and distance covered by B in 5 hours = $5 \times 60 \times 60 \times 2 \text{ m} = 36000 \text{ m}$

$$= \frac{3600}{100} = 36 \text{ km}$$

B will be ahead and $36 - 30 = 6 \text{ km}$ ahead.

Question 8.

Mohit covers a certain distance in 6 hrs by his scooter at a speed of 40 kmh⁻¹.

(i) Find the time taken by Manjoor to cover the same distance by his car at the speed of 60 kmh⁻¹.

(ii) Find the speed of Joseph, if he takes 8 hrs to complete the same distance.

Solution:

Mohit's speed = 40 km/h or kmh⁻¹

Distance covered in = 6 hours

Distance = 40 x 6 = 240 km

(i) Manjoor car's speed = 60 kmh⁻¹

He will cover the distance of 240 km in = $\frac{240}{60} = 4$ hours

(ii) Joseph covered that distance in 8 hours

His speed = $\frac{240}{8} = 30$ kmh⁻¹

Question 9.

A boy swims 200 m in still water and then returns back to the point of start in total 10 minutes. Find the speed of his swim in

(i) ms⁻¹

(ii) kmh⁻¹.

Solution:

Distance swimed by a boys of 200 m + 200 m = 400 m

Time taken = 10 minutes

$$(i) \therefore \text{His speed in m s}^{-1} = \frac{400}{10 \times 60} \\ = \frac{2}{3} \text{ m s}^{-1}$$

$$(ii) \text{Speed in km h}^{-1} = \frac{2}{3} \times \frac{3600}{1000} = \frac{24}{10} \\ = 2.4 \text{ km h}^{-1}$$

Question 10.

A distance of 14.4 km is covered in 2 horus 40 minutes. Find the speed in ms⁻¹. With this speed Sakshi goes to her school, 240 m away from her house and then returns back. How much time, in all, will Sakshi take?

Solution:

Distance = 14.4 km

Time taken to cover = 2 hrs 40 min

= $2\frac{2}{3} = \frac{8}{3}$ hrs

$$(i) \therefore \text{Speed in m/s} = \frac{14.4 \times 1000}{\frac{8}{3} \times 3600}$$

$$= \frac{144 \times 1000 \times 3}{10 \times 8 \times 3600} = \frac{3}{2} \text{ m s}^{-1}$$

$$= 1.5 \text{ m s}^{-1}$$

(ii) Distance from house to school and back
 $= 240 + 240 = 480 \text{ m}$

$$\therefore \text{Time taken} = \frac{480}{1.5} \text{ second}$$

$$= \frac{480 \times 10}{15} = 320 \text{ seconds}$$

$$= \frac{320}{60} \text{ min} = 5 \text{ min } 20 \text{ sec}$$

 Myclass24
Your Class. Your Pace.