Speed and Distance-Exercise Questions updated on Dec 2024

1. A boy runs 200 metres in 24 seconds. What is his speed?

a) 20 km/hr b) 24 km/hr c) 28.5 km/hr d) 30 km/hr

2. If the speed of a man is 45 km per hour, then what is the distance travelled by him in 30 seconds?

a) 275m b)360m c)375 m d) 420 m

3. An escalator moves towards the top level at the rate of 11 ft. sec and its length is 140 feet. If a person walks on the moving escalator at the rate of 3 feet per second towards the top level, how much time does he take to cover the entire length.

a) 14 sec b) 10 sec c) 12 sec d)8 sec

4. Two trains, 250 metres and 150 metres long respectively, are running on parallel lines. If they are running in the same directions, the faster train crosses the slower train in 40 seconds. If they are moving in the opposite direction they pass each other in eight seconds. What is the speed of the slower train?

a) 108kmph b) 82kmph c)92 kmph d) 72 kmph

5. Two persons, Ram & Lakshman, who are at a distance of 100 km from each other, move towards each other from two places P and Q at speeds of 20 kmph and 25 kmph respectively. Lakshman reaches P, returns immediately and meets Ram at R, who started on the return journey to P immediately after reaching Q. What is the distance between Q and R?

a) 33 1/3 km b) 25 km c)30km d)27 1/3 km

6. With out any halt a train travels a certain distance with an average speed of 75 km ph., and with halts it covers the same distance at an average speed of 60 kmph. When it is traveling with halts, how many minutes/per hours does the train halt on an average?

a)48 min. b)12min. c)15min. d)18min.

7. A lady starts from P towards Q and realizes that at a point R, if he walks 50 km further, he will be at a point S, which is as far away from R as it is from Q. What is the distance between P and Q if the distance between P and R is half the distance from R to Q?(Assume that P, Q, R and S are all on the same straight line)

a) 150 km b)200 km c)250 km d)125 km

8. In a 1000 m race Usha beats Shiny by 50 m. In the same race, by what time margin Shiny beat Mercy who runs at 4 m/s?

a) 100 sec. B) 50 sec c) 25 sec d) Data not sufficient

9. A and B participate in a 5000 m bicycle race which is being run on a circular track of 500 m. If the speed of A and B are 20 m/s and 10 m/s respectively, what is the distance covered by A when he passes B for the seventh time?

a) 2500 b) 2800 c) 4000 m 4) situation is not possible

10. Two buses A and B leave the same bus depot, A towards the North and B towards the East. The bus A travels at a speed of 5 km/hr more than that of the bus B. If after four hours the distance between the two buses is 100 km, find the speed of the bus A.

a) 60 kmph b) 40 kmph c) 20 kmph d) 15 kmph

11. A person travelled from his house to office at 30 kmph; then he was late to his office by 5 minutes. If he increases his speed by 10 kmph he would be early by 15 minutes to his office. What should be his speed so that he reaches his office on time?

a) 36 kmph b) 32 kmph c) 34 kmph d)35 kmph

12. A train 575 m long crosses a tunnel of length 325 in 90 sec. What is the speed of the train in kmph.

a) 28 b)32 c)36 d)24

13. A train which has 390 m long, is running 45 kmph. In what time will it cross a person moving at 9 kmph in same direction?

a) 26 sec b) 39 sec c)36 sec d)29 sec.

14.Two persons start running simultaneously around a circular track of length 400 m from the same point at speeds of 15 kmph and 25 kmph. When will they meet for the first time anywhere on the track if they are moving in the opposite direction?

a)144 b)36 c) 124 d)32

15. Two persons C & D started traveling from A and B which are 300 km apart, towards B and A respectively at 1.00 p.m. C travels at a constant speed of 30 kmph whereas D doubles his speed every hour. If D reaches A in 4 5/8 hours, at what time did C and D meet each other?

a) 4:30 p.m. b) 4:40 p.m. c) 5:00 p.m. d) 5:10 p.m.

16. Two trains T1 and T2 start simultaneously from two stations X and Y respectively towards each other. If they are 70 km apart both 3 and 6 hours after start, then find the distance between the two stations.

a) 210 km b)240 km c)220km d)180km

17. Ajith and Rana Walk around a circular course 115 km in circumference, starting together from the same point. If they walk at speed of 4 and 5 kmph respectively, in the same direction, when will they meet?

a) after 20 hours b) after 115 hours c) after 115 minutes d) after 20 minutes

18. There are 4 people who has to cross a stretch of 300 km. They normally run at a speed of 10 kmph. One of them has a bike that travels at 50 kmph. The bike first takes one person alone and crosses the stretch while the other two keep running. Then he comes back without wasting time and picks up another person from the way, drives him across the stretch, and does the same for the last person. How long does this whole process take?

a)24 hrs b)16 hrs c) 56/3 hrs d) 58/3 hrs

19. Ragav took a bus from home to market, that travels at 40 kmph. While walking back at 4 kmph, halfway through, he suddenly realized he was getting late and he cycled back the remaining distance in 30 kmph. Find the average speed.

a) 6.5 kmph b)12.0 kmph c)28.5 kmph d) none of these

20. Two trains of equal length 120 metres move in the same direction. The faster train completely overtakes the slower one in 15 seconds. If the slower train were to move at half its speed, the overtaking would take in 10 seconds. At what speeds are the 2 trains moving (faster and slower respectively in m/s)

a) 24, 22 b) 32, 16 c)30, 18 d) 28, 14

Answers & Explanations

1. Expl : 200/24 * 18/5 = 30 km/hr

2. Expl :The distance traveled in 30 sec = 45*(5/18) *30 =375m

3. Time taken to cover the entire length = tot.dist/resultant speed = 140/ (11+3) = 10sec

4. Expl : Let the speed of faster train be f and slower train be y.

Time taken to cross each other traveling in the same direction = 250 +150/ (x-y) = 40.....(1)

Time taken to cross each other traveling in the opposite direction = 250+150 /(x+y) = 8 .....(2)

From (1) and (2) f= 30 m/s and s = 20 m/s

Speed of slower train = 20 * 18/5 = 72 kmph

5. Expl : Ram takes 100/20 = 5 hours to cover the distance from P to Q. By that time Lakshman covers covers 5 *25 = 125 km

Lakshman covers 25 km more than the distance PQ . Now the distance between them = 75 km

Time taken by them to meet = Distance/ Relative speed = 75/(20+25) = 75/45 = 5/3 hrs.

Distance between Q and R is nothing but the distance covered by Ram in 5/3 hours = 20 *5/3 = 100/3 km or 33 1/3 km

6. Expl :

With halt in 1 hour the train travels 60km

With out halt for traveling same distance it take 60/75 = 4/5 = 48 minutes

:. 12 minutes is the halting time per hour

7. Expl : P___50_____ R ___50_____S____50___Q

The above figure gives the locations of P, R, S &Q in relation to each other.

8.Expl: Speed of Shiny = 50/ 10 = 5m/s

Time taken by shiny to complete the race is B = 1000/5 = 200 sec.

Time taken by Baley to complete the race is D = 1000/4 = 250 sec.

Hence, D-B = 50 sec

9.Track length = 500 m

Speed of A and B are 20m/s and 10 m/s respectively

Time taken by them to meet = length/ relative speed = 500/(20-10) 50 sec.

Time taken to meet for the 7^{th} time = 7 *50 =350 sec ……..(1)

Total duration of race = total legth of race/ speed

= 500/20 = 250 sec ……..(2)

From (1) and (2) we can find out that 7^{th} time meeting is not possible.

10. Let the speed of the bus B be x km/hr. Then the speed of the bus A will be (x +5) kmph

Distance traveled in 4 hours is 4x and 4(x + 5) for the two buses respectively (refer the figure)

$(4x)^2 + \{4 (x + 5) \}^2 = (100)^2$

$16x^2 + 16x^2 + 160x + 400 = 1000$

$32x^2 + 160x - 9600 = 0$

$x^2 + 5x - 300 = 0$ $(x-15) (x +20) = 0$

x = 15

:. Speed of the bus A = 15 +5 = 20 kmph

11. Expl : Let the distance between house and office be x km

(x/30) – (x/40) = 20/40; x/120 = 1/3 x = 40 km

Travlling at 40 kmph, he reaches office in 1 hour i.e. 15 minutes early

So required speed = 40/ 5/4 = 40 * 4/5 = 160/5 = 32 kmph

12. Total distance traveled = Length of train + Length of tunnel = 575 + 325 = 900

Time taken to cross the tunnel = 90 sec.

Speed in kmph = distance/time *18/5 = 900/90 * 18/5 = 180/5 = 36 kmph

13. Time taken to cross a moving person = length of train/ relative speed

Time taken = 390/((45-9) (5/18) = 390/ 36*(5/18) = 390/10 = 39 sec

14. Time taken to meet the first time = length of track/relative speed

= 400/ (15 +25) (5/18)

= 400/40 *(18/5) = 36 sec.

15. Let speed of D in first hour = x

D's speed = x+ 2x+ 4x+ 8x+ 16x*(5/8) = 25x

Given 25x=300 :. X = 12

At the end of four hours C traveled 120 (30 *4) kmph and D traveled 12 + 24+ 48 +96 = 180kmph

:. They meet each other after 4 hours ie at 5: p.m.

16. In first 3 hours T1 travels R km and T2 travels S km.

After 6 hours they traveled R+S+70+ 700

2(R+S) = R+S +140

R+S = 140

Hence distance between XY is R+S+ 70 = 140 +70 =210

17. Expl : Rana is the faster person. He gains 1 km in 1 hour. So Rana will gain one complete round over Ajith in 115 hours. i.e. they will meet after 115 hours.

18. Expl : Time taken to carry 2nd person = 300/50 = 6 hrs.

Time taken to meet 3rd person =(300-6*10)/(50+10) = 4 hrs

Time taken to carry 3rd person = 4 hours

Time taken to meet 4th person = (300 –140)/60 = 8/3

Total time = 6+4+4+8/3+8/3 = 58/3 hours

19. Let the distance be 2x(one way)

Time taken by bus = 2x/40, by walking =x/4, by cycling = x/30 hours

:. Average speed = $\frac{\text{Total Distance}}{\text{Total time}} = \frac{4x}{x/20 + x/4 + x/30} = \frac{4 * 60}{3+15+2} = 12.0$

20. The total distance covered for over taking = length of the two trains = 120 +120 = 240

Speed of faster train be x m/s and slower train be y m/s

In the first case Relative speed = x-y

Relative Speed = Distance / Time taken = x-y = 240/15 = 16 m/s……(1)

In the second case, the slower train moves at half its speed

Relative Speed = x-0.5y = 240/10 = 24 m/s ……..(2)

Solving equation 1 & 2 we get x = 32 and y = 16 .

:. The speed of the faster and slower trains are 32 m/s and 16 m/s respectively