PROBLEMS ON TRAIN

1. A 240 m long train crosses a platform twice its length in 2 min. what is the speed of the train?

A. 8 m/s
B. 4 m/s
C. 6 m/s
D. Can't be determined

2. A train, 120 m long, takes 6 seconds to pass a telegraph post; the speed of train is

A. 72 km/hr
B. 62 km/hr
C. 55 km/hr
D. 85 km/hr

3. A train leaves a station A at 7 am and reaches another station B at 11 am. Another train leaves B to 8 am and reaches A at 11:30 am. The two trains cross one another at

A. 8:36 AM
B. 8:56 AM
C. 9:00 AM
D. 9:24 AM

4. Two trains of same length are running in parallel tracks in the same direction with speed 60 km/hr and 90 km/hr respectively. The latter completely crosses the former in 30 seconds. The length of each train (in meters) is

A. 125
B. 150
C. 100
D. 115

5. A train passes a station 120 m long in 60 sec. at a speed of 72 km/hr. The time taken by the train to pass an electric perch is:

A. 12 sec
B. 34 sec
C. 54 sec
D. 64 sec

6. A train passes a platform in 40 sec and a woman standing on the platform in 30 sec. If the speed of the train is 108 km/hr, what is the length of the platform?

A. 100 m
B. 300 m
C. 900 m
D. 1020 m

7. A train takes 16 sec to pass through a station 140 m long and 14 sec to pass through another station 100 m long. The length of the train is :

A. 40 m
B. 80 m
C. 120 m
D. 180 m

8. A train 60 meter long is running with a speed of 48 kmph. In what time will it pass a man who is running at 6 kmph in the direction opposite to that in which the train is going?

A. 1 sec
B. 2 sec
C. 3 sec
D. 4 sec

9. Two trains is moving in opposite directions at 70 kmph and at 80 kmph. Their lengths are 1.3 km and 0.7 km respectively. The time taken by the slower train to cross the faster train in seconds is:

A. 24 sec
B. 48 sec
C. 76 sec
D. 102 sec

10. A train 150 metres long crosses a milestone in 15 seconds and crosses another train of the same length travelling in the opposite direction in 12 seconds. The speed of the second train in km/hr is

A. 52 km/hr
B. 56 km/hr
C. 54 km/hr
D. 58 km/hr

11. A train passes by a lamp post on a platform in 7 sec. and passes by the platform completely in 28 sec. if the length of the platform is 390 m. then length of the train (in meters) is

A. 120
B. 130
C. 140
D. 150

12. Two trains move from station A and station B towards each other at the speed of 50 km/h and 60 km/h. At the meeting point, the driver of the second train felt that the train has covered 120 km more. What is the distance between A and B?

A. 1320 km
B. 1100 km
C. 1200 km
D. 960 km

13. A goods train leaves a station at a certain time and at a fixed speed. After 8 hours, an express train leaves the same station and moves in the same direction at a uniform speed of 120 kmph, this train catches up the goods train in 7 hours. Find the speed of the goods train.

A. 50
B. 48
C. 56
D. 60

14. The ratio of the length of two trains X and Y is 4 : 7 and the ratio of the time taken by both trains to cross a man standing on a platform is 2 : 3. If the speed of the train X is 36 km/h find the speed of the train Y in m/s.

A. 35/3 m/s
B. 30 m/s
C. 20/3 m/s
D. 15 m/s

15. Two trains each having a length of 160 meters moving in opposite direction crossed each other in 9 seconds. If one train crossed a 200 metre long platform in 27 seconds, then the ratio of their speeds is:

A. 3 : 4
B. 5 : 3
C. 3 : 5
D. 5 : 7

16. On a station, a train is stopped for 6 minutes, but after this its speed is increased by 4 km/hr. When the train covers 36 km it manages its delay. What is the initial speed of the train?

A. 32 km/h
B. 36 km/h
C. 40 km/h
D. 42 km/h

17. A train 125 m long passes a person, running at 8 kmph in the same direction in which the train is going in 25 seconds. The speed of the train is:

A. 22
B. 36
C. 30
D. 26

18. A train is moving at a speed of 20 m/s and crosses a pole in 8 seconds. How long will it take to cross another train which is running in opposite direction at double speed and half the length of the first train?

A. 2 sec
B. 3 sec
C. 6 sec
D. 4 sec

19. A train is running at a speed of 36 km/h and crosses a bridge of length 250 m in 30 seconds. What is ratio between the length of train and the length of bridge?

A. 1 : 4
B. 1 : 2
C. 1 : 5
D. 3 : 2

20. A train leaves Mumbai at 9 am at a speed of 40 kmph. After one hour, another train leaves Mumbai in the same direction at a speed of 50 kmph. When and at what distance from Mumbai will the two trains meet?

A. 1:00 pm, 220 km
B. 1:00 pm, 200 km
C. 2:00, 200 km
D. 2:00 pm, 220 km

Answer:

1. C

Solution: To solve this question, we can apply a short trick approach

"When a train passes a platform or crosses a bridge it should travel the length equal to the sum of the

length of train and platform or bridge both"

Speed of train = (Length of train + Length of Platform) / Required time

Given,

Length of train = 240 m, Crossing time of platform = 2 × 60 = 120 sec

Length of platform = 240 × 2 = 480, Speed of train = x

By the short trick approach, we get

Speed of train = (240 + 480)/120

⇒ x = 720/120 = 6 m/s.

2. A

Solution: To solve this question, we can apply a short trick approach we get

Speed of train = Length of train / Time taken in crossing the pole

= 120/6 = 20 m/sec

= 20 × (18/5) = 72 kmph

3. D

Solution: Kindly refer to the video or go through the explanation given below :

Let the distance between the stations A & B be 4 kms.

∴ Speed A → B = 4/4 = 1 km/hr

& Speed B → A = 4/(7/2) = 8/7 km/hr

Suppose they meet x hours after 8 am.

Distance covered by both the trains to meet each other = Distance covered by them from 8 am

(1 + 8/7) × x = 3 kms (∵ Train A has already covered 1 km from 7 am to 8 am)

⇒ (15/7)x = 3

∴ x = 7/5 hr = 1 hr 24 mins

∴ They will meet at 9 : 24 AM. (After adding 1 hr 24 mins to 8 am.)

4. A

Solution: When two trains cross each other, they cover distance equal to the sum of their lengths with relative speed.

Let's take length of each train = x, total length of both trains = 2x, Crossing time = 30 sec.

Relative speed = 90 – 60 = 30 km/hr

= (30 × 5) / 18

= 25/3 m/sec.

∴ Total length = Time × Relative speed

⇒ 2x = (30 × 25)/3

⇒ (10 × 25)/2 = 125 m.

5. C

Solution: Given that:

Speed of the train = (72 × (5/18))m/sec = 20 m/sec.

Let the length of the train be x metres.

Then, (x + 120)/20 = 60 ⇒ x + 120 = 1200 ⇒ x = 1080.

So, time taken by the train to pass an electric perch

= (1080 × (1/20)) sec = 54 sec.

6. B

Solution: Speed of the train = (108 × (5/18)) = 30 m/sec.

Length of the train = Distance travelled to cross the woman x Time taken = (30 × 30) m = 900m.

Let the length of the platform be x meters.

Then, (x + 900)/40 = 30 ⇒ x + 900 = 1200 ⇒ x = 300 m.

7. D

Solution: Let the length of the train be x meters.

Now, as in both the cases the speed of the train is same.

So, (x + 140)/16 = (x + 100)/14

⇒ 14x + 1960 = 16x + 1600 .

⇒ 2x = 360 ⇒ 180 m.

So, the length of the x = 180m.

8. B

Solution: Speed of train relative to man = (48 + 6) km/hr = 54 km/hr.

⇒ (54 × (5/18)) = 15 m/sec.

So, time taken to pass the man = (60 × (1/15)) sec = 4 sec.

9. B

Solution: Relative speed = (70 + 80) = 150 km/hr.

⇒ (150 × (5/18))m/sec

⇒ (125/3)m/sec.

Distance covered = (1.30 + 0.7) km = 2 km = 2000 m

Reqd. time = ((3/125)× 2000) sec = 48 sec

10. C

Solution: Speed of the first train = 150/15 = 10 m/sec

Let the speed of the second train be x m/sec

Relative speed = (10 + x) m/sec

Length of train 1 + length of train 2 = 150 + 150 = 300 mtr

In the second scenario equation will be like 300/(10 + x) = 12

or, 300 = 120 + 12x

or, x = 180/12 = 15 m/sec

∴ speed of the second train = 15 × (18/5) = 54 km/hr

11. B

Solution: To solve this question, we can apply a short trick approach;

Length of train

= (Length of the platform/Difference in time) × (Time taken to cross a lamp post)

By the short trick approach, we get

= 390/(28 –7) × (7) ⇒ (390/21) × 7 = 130 m.

12. A

Solution: To solve this question, we can apply a short trick approach;

Distance = Difference in distance × (Sum of speeds / Difference in speeds)

Given,

Speed of 1st train = 50 km/hr;

Speed of 2nd train = 60 km/hr

Difference in distance = 120 km

By the short trick approach, we get

Distance = 120 × (50 + 60)/(60 - 50) = 120 × (110/10) = 1320 km.

13. C

Solution: Let the speed of the goods train be x kmph.

Distance covered by goods train in 15 hrs = Distance covered by express train in 7 hrs

So, 15x = 7 × 120 or x = 56.

So, Speed of goods train = 56 kmph.

14. A

Solution: Let the length of train X = 4a, time = 2b

Speed = 4a/2b

Let the length of train Y = 7a , time = 3b

Speed = 7a/3b

Ratio of the speed = (4a/2b)/(7a/ 3b) = 6 : 7

Speed of train Y = (36/6) × 7 = 42 km/h

in m/s = 42 × (5/18) = 35/3 m/s

15. C

Solution: Let the speed of one train be 'a' m/sec and that of another train be 'b' m/sec.

If the trains are moving in opposite direction then they will cover the distance equal to sum of their lengths in crossing each other and relatively their speed will add up.

While in crossing a platform the train will cover the distance equal to sum of length of train and platform length.

Then we have the following equations:

9 = (160 + 160) / (a + b)

⇒ a + b = 320 / 9 1

And 27 = (160 + 200) / a ⇒ a = 360/27 2

Substituting .....2 in .....1 we get

b = 600/27

⇒ required ratio = (360/27) / (600/27)

= 3 : 5

16. B

Solution: Let the speed of train be x km/hr

36/(x + 4) + 6 mins = 36/x

⇒ 36/x – 36/(x + 4) = 6/60

⇒ 36 ((1/x) – 1/(x + 4)) = 6/60

⇒ 36((x + 4 – x)/(x2+4x)) = 1/10

⇒ 360 × 4 = x^2 + 4x

⇒ x^2 + 4x – 1440 = 0

⇒ x^2 + 40x – 36x – 1440 = 0

⇒ x(x + 40) – 36(x + 40) = 0

⇒ (x + 40) (x – 36) = 0

⇒ x = 36 km/hr

17. D

Solution: Speed of the train relative to Person

= (125/25) m/sec = 5 m/sec

⇒ (5 × (18/5)) km/hr = 18 km/hr.

Let the speed of the train be x kmph. Then, relative speed = (x – 8) kmph

So, (x – 8) = 18 ⇒ x = 26 kmph

18. D

Solution: Since the speed of the train is 20 m/s and it takes 8 seconds to cross the pole, so the length of the train is

20 × 8 = 160 meters

Now the other train is coming at double speed = 40 m/s and its length is half = 80 meters

So the total length to be crossed becomes = 160 + 80 = 240 meters

And the relative speed becomes 40 + 20 = 60 m/s

Therefore, the time taken = 240/60 = 4 seconds

19. C

Solution: Speed = Distance/Time

36 × (5/18) = (x + 250) / 30

10 × 30 = x + 250

300 – 250 = x

x = 50 m

Ratio = 50 : 250 = 1 : 5

20. C

Solution: When the second train leaves Mumbai the first train covers 40 × 1 = 40 km

So, the distance between first train and second train is 40 km at 10:00 am

Time taken by the trains to meet

= Distance/relative speed

= 40 / (50 – 40) = 4 hours

So, the two trains will meet 4 × 50 = 200 km away from Mumbai at 2 p.m.