TIME, SPEED & DISTANCE

1. A man takes 5 hours 45 minutes to walk to a certain place and ride back. He would have saved 2 hours had he ridden both ways. The time he would take to walk both ways is

    A. 3 hours 45 minutes
    B. 7 hours 30 minutes
    C. 7 hours 45 minutes
    D. 11 hours 45 minutes

2. Two SUV cars start at the same time from Patna and Gaya, which are 110 km apart. If the two cars travel towards each other, they meet after one hour and if they travel in the same direction, the car from Patna overtakes the car from Gaya after 11 hours. What is the speed of the car starting from Gaya?

    A. 50 kmph
    B. 40 kmph
    C. 60 kmph
    D. 30 kmph

3. An aeroplane flies along the four sides of a square at the speeds of 200, 400, 600 and 800 km/hr . Find the average speed of the plane around the field.

    A. 384 km/hr
    B. 375 km/hr
    C. 432 km/hr
    D. 221 km/hr

4. A and B are two stations 390 km apart. A train starts from A at 10 a.m. and travels towards B at 65 kmph. Another train starts from B at 11 a.m. and travels towards A at 35 kmph. At what time do they meet?

    A. at 1.26 p.m.
    B. at 3.23 p.m.
    C. at 2.15 p.m.
    D. at 4.15 p.m.

5. If man walks at the rate of 5 kmph, he misses a train by 7 minutes. however, if he walks at the rate of 6 kmph , he reaches the station 5 minutes before the arrival of the train, find the distance covered by him to reach the station.

    A. 2 km
    B. 4 km

C. 5 km

D. 6 km

6. A thief is spotted by a policeman from a distance of 100 m. When the policeman starts the chase, the thief also starts running. If the speed of the thief be 8 km/hr and that of the policeman 10 km/hr. How far the thief will have run before he is overtaken?

A. 100 m

B. 150 m

C. 200 m

D. 400 m

7. A car driver, driving in a fog, passes a pedestrian who was walking at the rate of 2 km/h in the same direction. The pedestrian could see the car for 6 min and it was visible to him up to a distance of 0.6 km. What was the speed of the car?

A. 15 km/hr

B. 8 km/hr

C. 20 km/hr

D. 18 km/hr

8. Walking 6/7th of his usual speed a man gets late by 12 mins. The usual time taken by him to cover that distance is :

A. 1 hour

B. 1 hour 12 minutes

C. 1 hour 15 minutes

D. 1 hour 20 minutes

9. Alok walks to a viewpoint and returns to the starting point by his car and thus takes a total time of 6 hrs 45 min. He would have gained 2 hrs by driving both ways. How long would it have taken for him to walk both ways?

A. 7 hrs 45 min

B. 8 hrs 45 min

C. 5 hrs 30 min

D. None of these

10. A car is travelling at a constant rate of 45 km/h. The distance travelled by car from 10 : 40 am to 1 : 00 pm is

A. 165 km

B. 150 km

C. 120 km

D. 105 km

11. A father and his son start at a point A with speeds of 12 km/h and 18 km/h respectively and reach another point B. If his son starts 60 min after his father at A and reaches B, 60 min before his father, what is the distance between A and B?

    A. 90 km
    B. 72 km
    C. 36 km
    D. None of these

12. A wheel of radius 2.1 m of vehicle makes 75 revolutions in 1 min. what is the speed of the vehicle?

    A. 78 km/hr
    B. 37.4 km/hr
    C. 59.4 km/hr
    D. 35.4 km/hr

13. Two cars A and B start simultaneously from a certain place at the speed of 30 km/h and 45 km/h, respectively. The car B reaches the destination 2 h earlier than A. what is the distance between the starting point and destination?

    A. 90 km
    B. 180 km
    C. 270 km
    D. 360 km

14. The respective ratio between the speed of a car, a train, and a bus is 5 : 9 : 4.The average speed of the car , the bus and the train is 72 km/hr together. What is the average speed of the car and the train together?

    A. 82 km/h
    B. 72 km/h
    C. 84 km/h
    D. 67 km/h

15. A car covers four successive 7 km distances at speeds of 10 km/hour, 20 km/hour, 30 km/hour and 60 km/hour respectively. Its average speed over this distance is :

    A. 40 km/hr
    B. 20 km/hr
    C. 30 km/hr
    D. 50 km/hr

16. A person travelled 132 km by auto, 852 km by train and 248 km by bike. It took 21 hours in all. If the speed of train is 6 times the speed of auto and 1.5 times speed of bike, what is the speed of train?

    A. 78 kmh^{-1}
    B. 104 kmh^{-1}
    C. 96 kmh^{-1}
    D. 88 kmh^{-1}

17. A man starts from a place P and reaches the place Q in 7 hours. He travels 1/4 th of the distance at 10 km/hour and the remaining distance at 12 km/hour. The distance, in kilometer, between P and Q is:

    A. 70 km
    B. 72 km
    C. 80 km
    D. 90 km

18. A beats B by 15 sec in a 200 m race, B beats C by 25 sec in a 500 m race, C beats D by 32sec in 800 m race and D beats E by 35 sec in a 1 km race. What must be the speed of A in order to beat E by 800 m in a 2 km race?

    A. 2.5 m/s
    B. 3.33 m/s
    C. 5 m/s
    D. 6.66 m/s

19. A bus is running with a speed of 30 km/h on the road beside a railway track. The bus is 260 metres ahead of the engine of a 440 metres long train running with the speed 156 km/h in the same direction. In how much time will the train pass the bus completely?

    A. 20 seconds
    B. 40 seconds
    C. 35 seconds
    D. 25 seconds

20. Ram travels by a bicycle from Ranipur to Rajapur. Both towns are at the same height above sea level. The road he travels on has a total length of 20 km. However, there are few hills on the road. Ram is able to maintain a constant speed of 10 km/hr on level terrain, a constant speed of 6.5 km/hr travelling uphill, and a constant speed of 13.5 km/hr travelling downhill. How long does Ram's journey take, in minutes?

    A. 90

B. 100

C. 120

D. Data insufficient

21. A motor car does a journey in 16 hours, covering the first half at 30 Km/hr and the second half at 50 Km/hr. What is the distance covered?

    A. 480 km

    B. 540 km

    C. 600 km

    D. 400 km

22. A car travels the first one-third of a certain distance with a speed of 20 km/hr, the next one-third distance with a speed of 30 km/hr and the last one-third distance with a speed of 60 km/hr. The average speed of the car for the whole journey is

    A. 20

    B. 40

    C. 30

    D. 25

23. The length of a circular track is 800 m. Virat and Amresh started from the same point on the track and ran in opposite directions. Virat took 12 minutes to cover one kilometer while Amresh took only 9 minutes to cover the same distance. They kept running for 90 minutes. How many times did they cross each other?

    A. 10

    B. 20

    C. 21

    D. 30

24. Two friends A and B, with speed in the ratio 9 : 3, are running on track PQ. A starts from P towards Q and when he reaches point exactly in the middle of the track, B starts running from P towards Q. A reaches Q turns back and continues towards P and meets B at a distance of 155 m from Q. What is the total length of the track?

    A. 320 m

    B. 248 m

    C. 243 m

    D. 280 m

25. Karan beats arjun by 420 m in a 1260 m race. Then they go to race on a slope where Karan starts from bottom of the slope and Arjun starts from top of the slope they run towards each other and when they meet Arjun has travelled 50m more than Karan. If

the speed of any person on the slope, compared to normal speed, becomes 25% more in decline and 200/7% less in incline, what was the total length of the slope?

    A. 600 m

    B. 720 m

    C. 680 m

    D. 650 m

1. C

Solution: 1 Bike + 1 Walk = 5 hrs 45 mins

2 Bike = 3 hrs 45 mins

Hence 1 way Bike journey takes 1 hrs 52.5 mins

So, 1 way walk should take (5 hr 45 mins) – (1 hrs 52.5 mins) = 3 hr 52.5 mins

2-way walk would take: 3 hr 52.5 mins 2 = 7 hr 45 mins

2. A

Solution: Let the speed of the car from Patna be x and the speed of the car from Gaya be y.

Then, 110/(x + y) = 1

So, x + y = 110 ....(i)

And, 110/(x – y) = 11

∴ x – y = 10 ....(ii)

From equation (i) and (ii), we get

x = 60 kmph, y = 50 kmph

So, the speed of car from Gaya = 50 kmph

3. A

Solution: Let each side of square be 1 km and the average speed of the plane around the field be x km/hr. then,

1/200 + 1/400 + 1/600 + 1/800 = 4/x

⇒ 25/2400 = 4/x

⇔ x = (2400 × 4)/25 ⇒ 384.

So, average speed = 384 km/hr.

4. C

Solution: Suppose they meet x hours after 10 a.m. then,

(Distance moved by first in x hrs) + [Distance moved by second in (x – 1) hrs] = 390.

Here the first train is starting at 10 am while the second train is starting at 11 am which means the second

train has to travel 1 hour less to meet the first train. That's why the time taken here for the second train is (x –

1) hrs.

So, 65x + 35 (x – 1) = 390 ⇒ 100x = 425

x = 4(1/4)

So, they meet 4 hrs. 15 min. after 10 a.m. i.e, at 2.15 p.m.

5. D

Solution: Let the required distance be x km.

Difference in time taken at two different speeds = 12 min = 1/5 hr

So, (x/5)-(x/6)=1/5

6x-5x=6

x=6

Hence, the required distance is 6 km.

Point to remember: If a person in 1st scenario reaches a point, for instance, 15 min late and in the 2nd scenario he reaches the same point 15 min early, the time difference will always be the sum of both the time periods.

1st Scenario   2nd Scenario
at 9:15 am   at 8:45 am

Time difference = 30 min

Time difference = 15 + 15 = 30 min

6. D

Solution: Relative speed of policeman = (10 – 8) km/hr = 2 km/hr.

Time = Distance / Relative speed

Time taken by policeman to cover 100 m

= (100/1000 × 1/2) hr = 1/20 hr.

In 1/20 hrs, the thief covers a distance of

(8 × 1/20) km = 2/5 km = 400m

7. B

Solution: In 6 minutes, the car goes ahead by 0.6 km.

Hence, the relative speed of the car with respect to the pedestrian = 6 kmph

= Speed of car – Speed of pedestrian

We know that if two objects move in same direction at different speeds and if speed of 1st object = x km/hr

and speed of 2nd object = y km/hr, their relative speed = (x – y) km/hr [where x > y],

6 = Speed or car - 2

Therefore, speed of car = 6 + 2 = 8 kmph

8. B

Solution: New Speed = 6/7 of the usual speed

∴ New time taken

= 7/6 of the usual time

So,(7/6 of the usual time) – (usual time) = 12 mins

⇒ 1/6 of the usual time = 12 min

⇒ Usual time = 72 mins = 1 hr 12 mins

9. B

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

Both ways driving = One way walking and one way driving time + gain in time

Given,

Walking time + driving time = 6 hours 45 min

2 sides driving = 6 hrs 45 min + 2 hrs = 8 hrs 45 min.

10. D

Solution: Let the distance be x km.

And time taken by car = 2hr 20 mins

= 2(20/60) = 2(1/3)

= 7/3 hrs

Distance = Speed × Time

= (7/3)× 45 = 105 km.

11. B

Solution: Let the distance be x and the difference in time taken by the father and the son = 60 + 60 = 120 mins = 2 hrs. (The son reaches 2 hours faster than the father.)

Time taken by the father – Time taken by the son = 2 hours

(x/12) – (x/18) = 2

⇒(3x – 2x)/36 = 2 ⇒ x = 72 km

12. C

Solution: Radius of the wheel = 2.1 m and time taken to do given number of revolutions = 1 min = 1/60 hr

Distance covered in 1 revolution = 2πr

= 2 × (22/7) × 2.1

Distance covered in 75 revolutions;

= 75 × 2 × (22/7) × 2.1

= 990 m = 0.99 km

Reqd. speed = 0.99/(1/60) = 59.4 km/h

13. B

Solution: Let the distance be x km. then,

Time taken by the slower car – Time taken by the faster car = 2 hours

(x/30) – (x/45)

⇒(3x – 2x)/90 = 2

⇒ x = 180 km.

14. C

Solution: Let speed of the car, the train, and the bus be 5a Km/hr , 9a Km/hr and 4a Km/hr respectively

Given

total speed = (72 × 3) Km/hr = 216 Km/hr

⇒ 5a + 9a + 4a = 216

⇒ 18a = 216

⇒ a = 12Km/hr

⇒ Speed of car = 5 × 12 = 60 Km/hr

And

speed of train = 9 × 12 = 108 Km/hr

⇒ their average speed = (60 + 108)/2 = 84 Km/hr

15. B

Solution: Time taken at 10 km/hour = 7/10 hour

Time taken at 20 km/hour = 7/20 hour

Time taken at 30 km/hour = 7/30 hour

Time taken at 60 km/hour = 7/60 hour

Total time taken = 7/10 + 7/20 + 7/30 + 7/60

= 7/5 hour

= Average speed = (7 × 4) / (7/5) = 20 km/hour

16. C

Solution: Let the speed of auto be x kmph[1]. So, the speed of train will be 6x and that of bike will be = (6x)/1.5 = 4x

As per the given information,

Time taken by auto + Time taken by train + Time taken by bike = 21 hours

$\Rightarrow$ 132/x + 852/(6x) + 248/(4x) = 21

$\Rightarrow$ 132/x + 142/x + 62/x = 21

$\Rightarrow$ 21x = 132 + 142 + 62 = 336 x = 336/21 = 16

Speed of the train = 6x = 6 * 16 = 96kmh[-1]

17. C

Solution: Let one-fourth of the distance between P and Q be x km then

Time taken for the first one-fourth distance = (x/10) km/hour and

Time taken for the remaining distance = (3x/12) km/hour

Since Total time taken is 7 hours.

$\Rightarrow$ 7= (x/10) + (3x/12) =

On solving, x = 20

Total distance = 4x = 80 km.

18. B

Solution: A beats B by 15 sec means A reaches the destination 15 sec ahead of B or B reaches 15 sec later than B. Let all of them compete in a 2 km or 2000 m race, now we can compare them as follows:

A beats B by 150 sec, B beats C by 100 sec, C beats D by 80 sec, D beats E by 70 sec, $\Rightarrow$ E would finish the race 400 sec after A.

Now, if A has to beat E by 800 m then we can say that E will cover the remaining 800m in 400sec, and cover 2000m in 1000 sec. A has to reach 400s earlier i.e in 600 sec,

so A's speed = 2000/600 = 3.33 m/s.

19. A

Solution: Relative speed of the train with respect to the bus = 156 – 30 = 126km/h

= 126 × (5/18) = 35 m/s

Distance = 440 + 260 = 700 metre

Required time = 700/35 = 20 seconds

20. D

Solution: First, we need to find Ram's average speed.

Note that we are not sure whether the distance travelled uphill and the distance travelled downhill is the same or not because the slope uphill may or may not be equal to the slope downhill.

∴ Ram's average speed can't be together calculated.

∴ The time taken by Ram can't be calculated.

21. C

Solution: Since different speeds are travelled for equal distance, the average speed can be found out

Average speed = (2 × 30 × 50) / (30 + 50)

= 300/8 km/h

Distance covered = (300/8) × 16 = 600 km

22. C

Solution: Let the total distance covered = LCM of (20, 30, 60) = 60

As per the question, Distance covered by the car with each speed = 1/3 * 60 = 20km

(20/20) + (20/30) + (20/60)

⇒ 60/avg. speed

⇒ 6/3 = 60/avg. speed → average speed = 30 km/hr.

23. C

Solution: The time taken to cover one kilometer for Virat and Amresh is in the ratio 4:3

Their speeds are in the ratio 3: 4.

Virat covers 3/7th of the track and Amresh covers 4/7th from one crossing to the next i.e.

Virat covers (3/7) x 800 m from one crossing to the next.

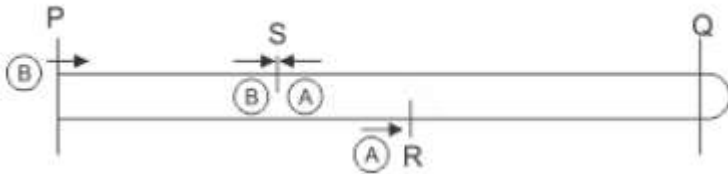In 90 min, Virat covers (90/12) × (1000) = 7500 m.

The number of crossings = (7500 × (7/3))/800 m. = 175/8=21.87

So, they will meet 21 times.

24. B

Solution:

When A reaches point R which is in the middle of the track, B starts from point P towards Q

The distance covered after point that will be in the ratio of their speeds

Therefore, RQ + QS / PS = 9 : 3 PS

RQ + QS + PS = 12 units

RQ + QS + PS = 3/4 * (2 × PQ)

So, PQ = 8 units and as PS = 3 units, therefore QS = 5 units

QS = 155m = 5 units → 1 unit = 31 m

PQ = 8 units = 8 × 31 = 248 m

25. D

Solution: Karan beats Arjun by 420 m in a 1260 m race
So the ratio of their speeds will be equal to the ratio of distance covered
S (Karan) / S (Arjun)
= 1260/840
= 126/84
Let their speeds be 126 k and 84 k
On the slope Karan goes upwards and Arjun goes downward
Speed of Karan on slope = 28(4/7)% less than original = 5/7 × 126k = 90k
Speed of Arjun on slope = 25% more than original = 5/4 × 84 k = 105 k
Let the distance travelled by them on slope be 90kx and 105kx,
Total distance travelled by them = 195 kx
The difference between the distance travelled = 50 m
105 kx – 90 kx = 50
15 kx = 50 → kx = 50/15
195 kx = 195 × 50 / 15 = 650 m
So, the total length of the slope is 650 m