Quantitative Aptitude

Speed Time & Distance

Level-1

Q1 A 400 m long train is running at the speed of 90 km/hr. Find the time taken by it to pass a man standing near the railway line.
(A) 15 sec   (B) 12 sec
(C) 16 sec   (D) 18 sec
(E) 24 sec

Q2 A 200 m long train is running at the speed of 72 km/hr. Find the time taken by it to pass a man standing near the railway line.
(A) 9 sec   (B) 10 sec
(C) 12 sec   (D) 15 sec
(E) 24 sec

Q3 A man is moving with a speed of 20 km/hr. After every km, he takes a rest of 3 minutes. How much time will he take to cover a distance of 75 km?
(A) 5 hours 12 minutes
(B) 3 hours 22 minutes
(C) 7 hours 27 minutes
(D) 3 hours 12 minutes
(E) 2 hours 12 minutes

Q4 There are two points A and B. Distance between A and B is $245\ km$. Ram starts walking from A with a speed of $15\ km/h$ and lakhan starts from B with a speed of $20\ km/h$. Find the time when both meet.
(A) $2\ hours$ (B) $3\ hours$
(C) $7\ hours$ (D) $6\ hours$
(E) $5\ hours$

Q5 A car travelling at a speed of 80 km/hour can complete a journey in 5 hours. How long will it take to travel the same distance at 50 km/hour?
(A) 7 hr   (B) 8 hr
(C) 12 hr   (D) 10 hr

(E) 18 hr

Q6 A can cover a distance from P to Q in 5 hours and the distance between P and Q is 200 km. If B can cover the same distance but he goes from Q towards P and they meet after 2 hours of start, then find the speed of B.
(A) 60   (B) 30
(C) 15   (D) 22
(E) 45

Q7 A can cover a distance from P to Q in 10 hours and the distance between P and Q is 300 km. If B can cover the same distance but he goes from Q towards P and they meet after 5 hours of start, then find the speed of B.
(A) 60   (B) 30
(C) 80   (D) 20
(E) 50

Q8 If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:
(A) 50 km   (B) 40 km
(C) 60 km   (D) 90 km
(E) none of these

Q9 A 500 m long train is running with a speed of 144 kmph. If it passes a man who is running at 54 kmph in the same direction in which the train is going, then find the time in which it will pass the man.
(A) 15 sec   (B) 18 sec
(C) 20 sec   (D) 10 sec
(E) 30 sec

Q10 A and B are traveling towards each other from the points P and Q respectively. After crossing each other, A and B take 4 and 9 hours

respectively to reach their destination Q and P respectively. If the speed of B is 18 kmph, then find the speed of A.

(A) 27   (B) 25

(C) 30   (D) 22

(E) 18

Q11 A boy goes to his school from his house at a speed of 10 km/hr and returns at a speed of 5 km/hr. If he takes 6 hours in going and coming, find the distance between his house and school.

(A) 40   (B) 20

(C) 30   (D) 16

(E) 50

Q12 A and B are traveling towards each other from the points P and Q respectively. After crossing each other, A and B take 16 and 9 hours respectively to reach their destination Q and P respectively. If the speed of B is 8 kmph and distance between P and Q is 216 km, then find the time taken by A to reach Q.

(A) 36   (B) 30

(C) 45   (D) 40

(E) 50

Q13 A Truck can go 100 km in 5 hours but there was an accident midway. After the accident, the speed of the truck reduces by 25%. If the accident occurs after covering 40 km, then find the total time taken by Truck.

(A) 5 hr   (B) 8 hr

(C) 6 hr   (D) 7 hr

(E) 11 hr

Q14 Two trucks 'A' and 'C' were moving towards each other which were 540 km away initially. If the ratio of the speed of the trucks 'A' and 'C' was 5 : 4 and the speed of the truck 'C' was 60 km/h, what time will it take for the two trucks to meet each other?

(A) 250 min.   (B) 240 min.

(C) 275 min.   (D) 270 min.

(E) None of these

Q15 In a 1500 m race, Chetna beats Vrutika by 100 m and in 1200 m race, Vrutika beats Kripa by 75 m. If Chetna and Kripa are compared, then for how much m Chetna will beat Kripa in 900 m race?

(A) 115 m   (B) 120 m

(C) 135 m   (D) 112.5 m

(E) None of these

Q16 Krishna covered a distance of 400 km in 10 hrs. The first part of his journey is covered by train, then he hired a taxi. The speed of the train and taxi is 30 km/hr and 45 km /hr respectively. Find the ratio of distance covered by train and taxi.

(A) 2:3   (B) 3:2

(C) 2:1   (D) 1:2

(E) None of these

Q17 A car is proceeding towards A at a uniform speed of 30 km/hr. While the car is 150 kms away from A an insect starting from A flies again and again between A and the car relentlessly. The speed of the insect is 40km/hr. Find the distance covered by the insect till the car reaches A.

(A) 150 km   (B) 180 km

(C) 200 km   (D) 250 km

(E) 300 km

Q18 A car going from A to B and again returning from B to A and in this journey the total time taken is 35 hours. If the distance between A and B is 210 km, then find the average speed of the car in this whole journey.

(A) 10 kmph   (B) 15 kmph

(C) 12 kmph   (D) 18 kmph

(E) 25 kmph

Q19 A car going from A to B and again returning from B to A and in this journey the total time taken is 48 hours. If the distance between A and B is 720 km, then find the average speed of the car in this whole journey.

(A) 10 kmph   (B) 30 kmph

(C) 20 kmph   (D) 25 kmph

(E) 24 kmph

Q20 Ananya drives the first 180 miles of her trip at a speed of 80 km/hr and the rest of the trip at 110 km/hr. Her average speed for the entire trip is 100 km/hr. Find the length of the trip. (1 mile ~ 1.6 km)

(A) 625 miles   (B) 800 miles

(C) 775 miles   (D) 675 miles

(E) 575 miles

Level-2

Q1 **A fired a bullet and after (x+3) sec it was heard by B who was standing at a certain distance from the place where the bullet fired. If the speed of air is x m/sec and the distance between A and B is 10 meters, then find the value of x.**

(A) 4   (B) 1

(C) 5   (D) 2

(E) 7

Q2 **A bus left town A for town B. Having traveled 33.33% of the distance, it stopped for 5 hours due to road blockage. It traveled 300 km of the total distance by this time. After it started again, the driver increased the speed by 25 km/h and reached town B at the scheduled time. What was the original speed of the bus?**

(A) 20   (B) 25

(C) 15   (D) 35

(E) 28

Q3 A gun fired 2 bullets in an interval of 20 minutes at a place but a person running towards the place heard it after 18 minutes from the first firing. If the speed of the sound in 234 m/s, then find the speed of the person.

(A) 26 m/sec   (B) 32 m/sec

(C) 33 m/sec   (D) 51 m/sec

(E) None of these

Q4 A gun fired in an interval of 10 minutes at a place but a person running towards the place heard it after 8 minutes from the first firing. If the speed of the sound is 320 m/s, then find the speed of the person.

(A) 60   (B) 90

(C) 80   (D) 50

(E) None of these

Q5 A gun fired in an interval of 25 minutes at a place but a person running towards the place heard it after 20 minutes from the first firing. If

the speed of the sound is 300 m/s, then find the speed of the person in kmph.

(A) 250 kmph   (B) 280 kmph

(C) 220 kmph   (D) 270 kmph

(E) None of these

Q6 A gun fired two shots at an interval and the person who was coming on the bike heard it after 10 minutes. If the speed of the bike was 180 kmph and the speed of sound is 300 m/sec, then find the actual interval of the shots fired.

(A) 12   (B) 10

(C) 46   (D) 34

(E) None of these

Q7 A person starts from a point and walks at the speed of 30km/h for 30minutes and then he gets the lift from a person on bike and then he travels at a speed of60 km/hr for the next 30 minutes. What is the total distance moved by the person from the starting point?

(A) 40 km   (B) 50 km

(C) 45 km   (D) 30 km

(E) 60 km

Q8 'A' and 'B' start running together from point 'X' towards point 'Y'. At the same time, 'C' leaves from point 'Y' towards point 'X'. 'C' meets 'A' and 'B' at points 'M' and 'N' respectively, which are 150 metre and 75 metres away from point 'X'. Find the ratio of speed of 'A' to 'B', given that 'X' and 'Y' are 225 metres apart.

(A) 4:1   (B) 2:3

(C) 3:2   (D) 2:1

(E) 3:5

Q9 **A cyclist, after cycling a distance of 50 km on the first day, finds that the ratio of distance covered by him on the first two days is 5:4. If he travels a distance of 60 km on the third day. If the speed of the cyclist is 5 kmph, then find the time taken to cover the distance equal to the**

difference of distance on the third day and first day.

(A) 2   (B) 3

(C) 4   (D) 5

(E) 8

Q10 **Directions: Study the following question carefully and choose the right answer given beside.**

Amardeep goes to park daily. His last week average speed with which he completed one round of the park was 47Km/h, for the first four days was 37Km/h, and that for the last four days was 52.5Km/h. Find out the time taken by Amardeep to travel 203 Km if he travels with the speed of the fourth day.

(A) 8 hours   (B) 5.5 hours

(C) 7 hours   (D) 6 hours

(E) None of these

Q11 **A constable follows a thief who is 250 m ahead of the constable. If the constable and the thief run at speeds of 54 km/hour and 18 km/hour respectively, would the constable catch the thief in what time?**

(A) 15 sec   (B) 12 sec

(C) 18 sec   (D) 25 sec

(E) 36 sec

Q12 **A car travels from P to Q at a constant speed. If its speed were increased by 5 km/h, it would have taken one hour less to cover the distance. It would have taken 4 hours less if the speed was further increased by 40 km/h. If the speed initially was 45 kmph, then find the distance between the two cities and time taken in the last assumption in which speed increased by 40 kmph..**

(A) 420 km, 2 hr   (B) 120 km, 8 hr

(C) 100 km, 6 hr   (D) 450 km, 5 hr

(E) 220 km, 3 hr

Q13 **A car driver leaves Bangalore at 9.30 A.M. and expects to reach a place 300 km from Bangalore at 1.30 P.M. At 11.30 he finds that he** has covered only 30% of the distance. By how much does he has to increase the speed of the car in order to keep up his schedule?

(A) 80 kmph   (B) 60 kmph

(C) 70 kmph   (D) 90 kmph

(E) 75 kmph

Q14 Distance between two bus stations X and Y is 500 km. Buses P and Q leave station X and Y at 9 a.m. and 11 a.m. respectively at the speed of 50 kmph and 30 kmph respectively for the journey towards Y and X respectively. If the time taken by Q to meet bus P is k hrs. Then find = 50% of k + 150% of k

(A) 10   (B) 11

(C) 12   (D) 13

(E) 17

Q15 45 pillars are standing in a line such that distance between any two consecutive pillars is the same. A car traveling with a uniform speed of 72 km/h takes 18 sec to reach the 1st pole to the 10th pole. What is the distance between the 10th and 31st poles?

(A) $800\ m$ (B) $900\ m$

(C) $840\ m$ (D) $940\ m$

(E) 960 m

Q16 A bus leaves a city P at 8:00 A.M. On its way to city Q, it overtakes a motorcycle at 10:00 A.M. and reaches Q at 11:30 A.M. It halts at Q for half an hour and starts moving towards P. It meets the same motorcycle at 1:00 P.M. What is the ratio of the speed of the bus to the speed of the motorcycle?

(A) 6: 1   (B) 4: 1

(C) 5: 1   (D) 7: 2

(E) 7: 3

Q17 A car covers ____ km in 9 hours. The speed of the train is double of the speed of the car. The train covers 360 km in _____ hours.

Find which of the given options fill the blank to make the statement correct?

(A) 450, 2   (B) 648, 3.5

(C) 324, 4   (D) 540, 3

(E) 650, 5

Q18 A dog pursues a cat and takes 8 leaps for every 10 leaps of the cat, but 5 leaps of the dog are equal to 3 leaps of the cat. What is ratio of the speeds of the dog and the cat?

(A) 14: 5   (B) 12: 25

(C) 13: 6   (D) 3: 2

(E) 5: 2

Q19 The distance between Delhi and Patna is Y km. Train P leaves from Delhi for Patna at a speed of x km/h and at the same time, Train Q leaves from Patna for Delhi at a speed of (x + 9) km/h. At the end of 12 hours, they meet each other and then find the speed of the train Q? Where

$$Y = 1260 \div 6 \times 3 - 42$$

(A) 29 km/h   (B) 22 km/h

(C) 25 km/h   (D) 33 km/h

(E) 36 km/h

Q20 Varun was traveling at the speed of 65 km/h. A car with speed 80 km/h passed Varun and then Varun increased his speed by 5 km/h every hour. When Varun passed the car, he stopped increasing his speed and continued at the current speed. After passing the car, what was the distance between Varun and the car, after 2 hours?

(A) 25 km   (B) 30 km

(C) 40 km   (D) 45 km

(E) 60 km

Q21 Ranjeet drove from home to his office at 75 miles per hour and reached the office in 6 hours. While returning home he drove one-third way along the same route at a speed of 30 miles per hour and the remaining distance he covered in 2 hours. Find the average speed of returning.

(A) 108.56 miles/hr

(B) 128.57 miles/hr

(C) 124.27 miles/hr

(D) 90.75 miles/hr

(E) None of these

Q22 Rahul is going from Gurgaon to Agra from his car at the speed of 80 kmph. After 120 km, he reduces his speed by 12.5% and completes the whole journey in 5.5 hours. Find the total time taken by him to cover the same distance, if he had reduced the speed after 2 hours.

(A) 6 hours   (B) 5.2 hours

(C) $5\frac{3}{7}$ hours   (D) $4\frac{3}{7}$ hours

(E) 4.8 hours

Q23 Aman, Beena and Chetan start running around a circular field having circumference 180 metre at the same time from the same point. Speeds of Aman, Beena and Chetan are 2 m/minute, 2.5 m/minute and 3 m/minute. Find after how much time, they will meet again at the same point for the first time.

(A) 7 hours   (B) 9 hours

(C) 6 hours   (D) 5 hours

(E) None of these

Level-3

Q1 A car can cover a distance of 700 Km in 10 hours. Speed of a bus is 14.28% less than the speed of the car and the speed of a train is 16.66% more than the speed of the bus. Find the respective ratio of the distance covered by the car in 20 hours and distance covered by the train in 10 hours.

(A) 2:1 (B) 1:2
(C) 3:2 (D) 2:3
(E) 1 : 1

Q2 A can cover a distance from P to Q in x hours and the distance between P and Q is (5x+20) km. If B can cover the same distance but he goes from Q towards P and they meet after 3 hours of start and the speed of B is (x–10) kmph, then find the value of x.

(A) 55 (B) 50
(C) 60 (D) 100
(E) 75

Q3 A can cover a distance from P to Q with the speed of x km/hr and the distance between P and Q is (x+120) km. If B can cover the same distance but he goes from Q towards P and they meet after 2 hours of start and the speed of B is (x–60) kmph, then find the value of x.

(A) 80 (B) 70
(C) 60 (D) 50
(E) 55

Q4 A and B are traveling towards each other from the points P and Q respectively. After crossing each other, A and B take 1 hour and (x+11) hours respectively to reach their destination Q and P respectively. If the speed of B is x kmph and the speed of A is (x+15) kmph, then find the value of x.

(A) 5 (B) 6
(C) 8 (D) 4
(E) 9

Q5 A and B are traveling towards each other from the points P and Q respectively. After crossing each other, A and B take (x+2.5) hours and (x+6) hours respectively to reach their destination Q and P respectively. If the speed of B is 3 kmph and the speed of A is 4 kmph, then find the value of x.

(A) 2 (B) 4
(C) 6 (D) 8
(E) 11

Q6 Length of train A is X meters that crosses a 250 meters platform in 45 seconds. Length of train B is 500 meters that crosses a bridge in 65/3 seconds and length of the platform is 100 meters more than that of bridge. Speed of train B is 10 m/sec more than train A.

Speed of a boat in still water is 25% speed of train A. If boat covers $\frac{3X}{5}$ km upstream in 30 hours, then find the speed of current.

(A) 7 km/hr (B) 6 km/hr
(C) 5 km/hr (D) 4 km/hr
(E) None of these

Q7 **Direction: Study the following data carefully and answer the questions:**

Bus P started running at 12:30 PM from point A to point B and bus Q started running at 2:30 PM from point A to point B. Time taken by bus P to reach point B is 2.5 hours more than that taken by bus Q to reach point B. Ratio of speed of bus P to that of bus Q is 3:4 and distance between points A and B is 648 km.

Which of the following is/are true?

M: If speed of bus P were 15% less than its original speed, then it would not reach point B on the same day.

N: Speed of bus P is 8 m/s less than that of bus Q.

O: Bus Q will reach point B at 9:00 PM.

(A) Only M (B) Only O

(C) Only N and O   (D) All M, N and O

(E) Only N

Q8 A man covered a certain distance with a speed of 25 km/hr in 'x' hours. If he had traveled with a speed of (15 + 5x) km/hr for (x − 4) hours then he would have covered 60 km less distance. The distance traveled by him with the speed of 25 km/hr can be:

I. $(x^2 + 114)$ km

II. $(20x + 40)$ km

III. $(40x − 90)$ km

(A) Only II and III

(B) Only I

(C) Only II

(D) Only II and I

(E) Only I and III

Q9 Length of train A is X meters that crosses a 250 meters platform in 45 seconds. Length of train B is 500 meters that crosses a bridge in $\frac{65}{3}$ seconds and length of the platform is 100 meters more than that of the bridge. Speed of train B is 10 m/sec more than train A.

A boat covers $\frac{2X}{13}$ km downstream in $6\frac{2}{3}$ hours and speed of current is $\frac{1}{18}$ th of the speed of train B. If speed of the boat in still water is (U−4) km/h, then find the value of U.

(A) 11   (B) 12

(C) 13   (D) 14

(E) 15

Q10 P and Q started from point A and point B and running towards each other at speed of Z km/h and Y km/h respectively. Speed of P is 30 km/h more than that of Q while distance covered by P is thrice as that of Q. Distance between A and B is 240 km, sum of travelling time of P (M) and Q (N) is $\frac{21}{2}$ hours. Find which of the following statement is true?

I. $(2Z + 3Y) = 110$

II. Distance travelled by a person running at (Y + 10) km in M hours is 90 km

III. $\frac{Z}{Y} = \frac{3}{1}$

(A) I and III only

(B) II and III only

(C) I, II, and III

(D) I and II only

(E) None of these

Answer Key

Level-1

Q1	(C)	Q11	(B)
Q2	(B)	Q12	(A)
Q3	(C)	Q13	(C)
Q4	(C)	Q14	(B)
Q5	(B)	Q15	(D)
Q6	(A)	Q16	(D)
Q7	(B)	Q17	(C)
Q8	(A)	Q18	(C)
Q9	(C)	Q19	(B)
Q10	(A)	Q20	(D)

Level-2

Q1	(D)		Q13	(B)
Q2	(C)		Q14	(A)
Q3	(A)		Q15	(C)
Q4	(C)		Q16	(A)
Q5	(D)		Q17	(D)
Q6	(A)		Q18	(B)
Q7	(C)		Q19	(A)
Q8	(A)		Q20	(B)
Q9	(A)		Q21	(B)
Q10	(C)		Q22	(C)
Q11	(D)		Q23	(C)
Q12	(D)			

Level-3

Q1	(A)		Q6	(C)
Q2	(B)		Q7	(A)
Q3	(A)		Q8	(E)
Q4	(A)		Q9	(C)
Q5	(A)		Q10	(D)

Hints & Solutions

Level-1

Q1 Text Solution:

Speed of train= 90 kmph = $\frac{5}{18} \times 90$= 25 m/s

length of trains = $400\ m$

Time taken by train to pass the man = $\frac{400}{25} = 16\ sec$

Q2 Text Solution:

Length of train = $200\ m$

Speed of train = 72 kmph = $72 \times \frac{5}{18} = 20\ m/s$

Time taken to cross the man = $\frac{200}{20} = 10\ sec$

Q3 Text Solution:

Time taken to cover 75 km = $\frac{75}{20}$ = 3 hours 45 minutes

He takes a rest of 3 minutes after every 3 minutes.

So, rest duration = $3 \times (75 - 1) = 222$ minutes = 3 hours 42 minutes

Required time = 3 hours 45 minutes + 3 hours 42 minutes = 7 hours 27 minutes

Option '7 hours 27 minutes' is the correct answer.

Q4 Text Solution:

Relative speed = (20 + 15) km / h   (if opposite direction)

= 35 km / h

∴ Required time = 245 / 35 = 7 hours

Q5 Text Solution:

Total distance travelled by car = $80 \times 5 = 400\ km$

Time taken by car while traveling at 50 km/ hr = $\frac{400}{50} = 8\ hr$

Q6 Text Solution:

Let the speed of B be x kmph.

Distance between P and Q = $200 km$.

Speed of A = $\frac{200}{5} = 40\ kmph$

Relative speed of A and B $= 40 + x\ kmph$

Time taken to meet $= 2\ hours$

$\frac{200}{x+40} = 2$

$2x = 120$

$x = 60\ kmph$

Q7 Text Solution:

Let speed of B be k km/hr

Relative speed $= k + 30\ km/hr$

Distance between P and Q $= 300\ km$

Speed of A $= \frac{300}{10} = 30\ km/hr$

Time taken to meet = 5 hr

$\frac{300}{k+30} = 5$

$k + 30 = 60$

$k = 30\ km/hr$

∴ Hence the answer is 30 km/hr

Q8 Text Solution:

Let the actual distance travelled be **x** km.

$\frac{x}{10} = \frac{x+20}{14}$

14**x** = 10**x** + 200

4**x** = 200

x = 50 km.

Q9 Text Solution:

length of train=500 m.

Relative speed of man and train $= 144 - 54\ kmph = 90\ kmph = 25\ m/s$

Time taken to cross the faster train = $\frac{500}{25} = 20\ sec$

Q10 Text Solution:

Let the speed of Car A be x kmph

Speed of Car B = 18 kmph

Speed of Car A = x kmph

$\frac{S_B}{S_A} = \sqrt{\frac{T_A}{T_B}}$

$18 = x(\frac{2}{3})$

$x = 27\ kmph$

Q11 Text Solution:

Let the total distance between house and school be k km.

As per question;

$\frac{k}{10} + \frac{k}{5} = 6$

$\frac{15k}{50} = 6$

$k = 20\ km$

Q12 Text Solution:

Let the speed of A to reach Q after the meeting be T hr.

Speed of B S_B = 8 kmph

Speed of A S_A = x kmph

$\frac{S_B}{S_A} = \sqrt{\frac{T_A}{T_B}}$

$\frac{8}{x} = \sqrt{\frac{16}{9}}$

$8 = \frac{4}{3}x$

x = 6 kmph

Total time taken By A to reach Q $= \frac{216}{6} = 36 \; hr$

∴ The answer is 36 hr.

Q13 Text Solution:

Speed of truck $= \frac{100}{5} = 20 \; km/hr$

Speed of truck after accident $= \frac{3}{4} \times 20 = 15 \; km/hr$

Remaining distance after accident $= 100 - 40 = 60 \; km$

Time taken by bike B $= \frac{40}{20} + \frac{60}{15} = 6 \; hr$

Q14 Text Solution:

From the given information,

Two trucks 'A' and 'C' were moving towards each other which were 540 km away initially.

The ratio of the speed of the trucks 'A' and 'C' was respectively 5: 4 and the speed of the truck 'C' was 60 km/h.

So, the speed of truck 'A' $= 60 \times \frac{5}{4} = 75 \; km/h$

As, the both trucks were moving towards each other, the relative speed will be = (75 + 60) km/h = 135 km/hr.

∴ The two trucks meet each other in $= \frac{540}{135} = 4 \; hours = 240 \; minutes$

Q15 Text Solution:

From the given information,

Chetna can beat Vrutika by 100 m in 1500 m race.

Hence, when Chetna covers 1500 m, Vrutika covers 1400 m.

So when Chetna covers 900 m, Vrutika will cover 840 m.

Similarly, when Vrutika covers 1200 m, Kripa covers 1125 m.

So, when Vrutika covers 840 m, Kripa will cover 787.5 m.

∴ Chetna will beat Kripa by 112.5 m.

Q16 Text Solution:

Average speed of Krishna = $\frac{Total\;distance}{Total\;time} = \frac{400}{10} = $ 40km/hr

Transport	train	Taxi
Speed	30	45
		40
Ratio	(45-40) = 5	(40-30) = 10

= 1:2

As, Speed ∝ Distance, hence required ratio = 1:2

Q17 Text Solution:

Time taken by car to reach A when its is 150 kms aways = $\frac{150}{30} = 5 \; hrs$

Speed of insect = 40 kmph

Distance travelled by insect in 5 hrs $= 40 \times 5 = 200 \; km$

Q18 Text Solution:

Average Speed $= \frac{Total\;Distance}{Time\;taken}$

$= \frac{210+210}{35} = 12 \; km/hr$

Q19 Text Solution:

Distance between A and B = 720 km

Average Speed $= \frac{Total\;Distance\;travelled\;between\;A\;and\;B}{Total\;Time\;taken}$

$= \frac{720+720}{48} = 30 \; km/hr$

Q20 Text Solution:

Let the total distance be 'x' miles, then

x = $100 \times \left[\frac{180}{80} + \frac{x-180}{110} \right]$

Thus x = 675 miles.

Hints & Solutions

Q1 Text Solution:

Distance = 10m

Time $= (x+3)\ sec$

Speed of air = x m/sec

ATP

$\frac{10}{x} = (x+3)$

$=> x^2 + 3x - 10 = 0$

$=> x^2 + 5x - 2x - 10 = 0$

$=> x(x+5) - 2(x+5) = 0$

$=> (x-2)(x+5) = 0$

$=> x = +2, -5$

Value of x cannot be in negative

so the value of x = 2

Q2 Text Solution:

Let the original speed of the bus be x kmph.

Total distance to travel $= 3 \times 300 = 900\ km$

Remaining distance $= 900 - 300 = 600\ km$

New speed $= x + 25\ kmph$

As per question;

Time taken to travel 300 km will be equal to 5 hours more than time taken to travel the rest 600 km

$\frac{300}{x} = \frac{600}{x+25} + 5$

$\left(\frac{300}{x}\right) - \left(\frac{600}{x+25}\right) = 5$

$x = 15$

The original speed of the bus is 15 kmph

Q3 Text Solution:

Let the speed of the person be 'x'

Total distance covered by the sound of 1st bullet - Total distance covered by sound of 2nd bullet = Total distance covered by the person

$=> (234 \times 20 - 234 \times 18)60 = x \times 18 \times 60$

$=> x = speed\ of\ the\ person = 26\ m/s$

Q4 Text Solution:

Let the speed of the person be x m/s.

Time delay is listening the gun sound $= 10 - 8 = 2\ min$

Distance travelled by bullet in 2 min $= 2 \times 320\ m$

As per question;

$2 \times 320 = 8 \times x$

$=> x = 80\ m/s$

Q5 Text Solution:

Let the speed of the person be x m/s.

Time delay in listening the gun fired $= 25 - 20 = 5\ min = 300\ sec$

Distance travelled by bullet in 300 sec $= 300 \times 300\ m$

As per question;

$300 \times 300 = x \times 20 \times 60$

$=> x = 75\ m/s = 75 \times \frac{18}{5} = 270\ kmph$

Q6 Text Solution:

Let the actual interval of the shot fired be k sec.

Total distance covered by the sound of 1st bullet - Total distance covered by sound of 2nd bullet = Total distance covered by the bike

$=> (300 \times k - 300 \times 10)60$

$= Speed\ of\ bike\ \times 12 \times 60$

$=> 300(k-10) = 180 \times \left(\frac{5}{18}\right) \times 12$

$=> k - 10 = 2$

$=> k = 12\ sec$

Q7 Text Solution:

We know that speed=distance travelled/time

30 minutes = 30/60 =1/2 hours

Let us take the first case when he was walking

total distance=(speed of walking)(time taken)

30(1/2)=15km..............................(1)

Now he got the lift and new speed=60km/h

For next 30 minutes distance traveled=(speed)(time taken)

60(1/2)=30km\..............................(2)

Adding equations 1 and 2 we get the total distance:

So total distance moved=15+30=45km

Q8 Text Solution:

Given, 'C' meets 'A' and 'B' at points 'M' and 'N' respectively, which are 150 metre and 75 metres

away from point 'X'

XN = 75 metres

XM = 150 metres

Therefore, NM = 150 − 75 = 75 metres

Therefore, XN = XM = 75 metres

Also, YM = 225 − 75 − 75 = 75 metres

Distance covered by 'A' by the time he meets 'C' = 150 metres

Distance covered by 'C' during the same duration = 75 metres

Since time taken by 'A' and 'C' is same, the ratio of speeds of 'A' and 'C' will be same as the ratio of distance covered by them.

So, ratio of speeds of 'A' and 'C' = 150:75 = 2:1

Similarly, distance covered by 'B' by the time he meets 'C' = 75 metres

Distance covered by 'C' during the same duration = 150 metres

So, ratio of speeds of 'B' and 'C' = 75:150 = 1:2

Let the speed of 'A' be 2x m/s

So, speed of 'C' = (2x/2) = x m/s

And speed of 'B' = (x/2) = (x/2) m/s

So, required ratio = 2x:(x/2) = 4:1

Hence, option a.

Q9   Text Solution:

Distance covered in 1st : 2nd day $= 5 : 4$

$50 : 2nd\ day = 5 : 4$

Distance covered in 2nd day $= 40\ km$

Difference of 1st day and 3rd distance $= 60 - 50 = 10\ km$

Time taken to cover 10 km $= \frac{10}{5} = 2\ hr$

Q10   Text Solution:

From the given information,

Let, Speed on the fourth day = a

total speed for the first three days = X

& total speed for the last three days = Y

Now,

Total speed for the week, S = 47 × 7 = 329

Total speed for the first four days = X + a = 37 × 4 = 148

Total speed for the last four days = Y + a = 52.5 × 4 = 210

According to the question,

X + a + Y = S

⇒ (X + a) + (Y + a) − a = 329

⇒ 148 + 210 − a = 329

⇒ a = 358 − 329

⇒ a = 29 Km/h

Therefore, time taken to travel 203 km $= \frac{203}{29} = 7\ hours$

Q11   Text Solution:

Relative speed of constable and thief $= 54 - 18 = 36\ kmph = 10\ m/s$

Distance between them $= 250\ m$

Time taken to catch the thief $= \frac{250}{10} = 25\ sec$

Q12   Text Solution:

Let the distance to reach his office be x km.

As per question;

$\frac{x}{45} + \frac{x}{50} = 1$

$50\,x - 45\,x = 45 \times 50$

$5x = 45 \times 50$

$x = 450\ km$

So, final speed $= 45 + 5 + 40 = 90\ kmph$

Time taken $= \frac{450}{90} = 5\ hr$

Q13   Text Solution:

Distance covered till 11:30 a.m. $= 30\% \ of\ 300 = 90\ km$

Speed of the car till 11: 30 a.m $= \frac{90}{2} = 45\ km/hr$

Remaining distance $= 300 - 90 = 210\ km$

Speed of car to reach Bangalore at time $= \frac{210}{2} = 105\ km/hr$

Therefore; speed should increase by $(105 - 45) = 60\ km/hr$

Q14   Text Solution:

Relative speed of buses $= 50 + 30 = 80\ kmph$

Distance travelled by P till 11 am $= 50 \times 2 = 100\ km$

Remaining distance $= 500 - 100 = 400\ km$

Time taken by Q to meet P ,k$= \frac{400}{80} = 5\ hrs$

Therefore; 50% of k + 150% of k $= 2.5 + 7.5 = 10$

Q15   Text Solution:

Let the distance between the 1st pole and 10th pole will be 9 units.

So, Time is taken to cross 1 unit $= \frac{18}{9} \Rightarrow 2$ seconds

Given, a uniform speed of the car $= 72 \ km/h$

Speed $= 72 \times \frac{5}{18} \Rightarrow 20 \ m/s$

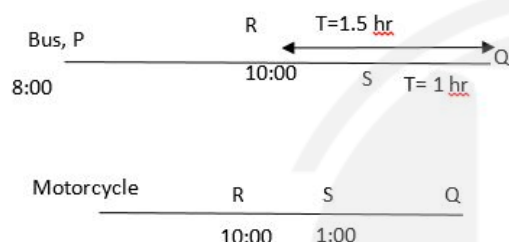So, the distance between two poles $= 1$ unit

As we know,

$speed = \frac{\text{distance}}{\text{time}}$

So, distance $= 20 \times 2 \Rightarrow 40 \ m$

Hence, the distance between the 10th to 31st pole will be $31 - 10 \Rightarrow 21$ units

$21 \times 40 \ m \Rightarrow 840 \ m$

Q16   Text Solution:

As the bus takes 0.5 hrs to travel from R to S and the motorcycle takes 3 hours to travel from R to S. So the ratio of time taken becomes 1:6 and so the speeds are in the ratio of 6:1.

Q17   Text Solution:

Let's check the option D,

The speed of the car is $\frac{540}{9}$ = 60 km/hr.

The speed of the train is 120 km/hr

360 km covers by train in $\frac{360}{120}$ = 3 hours.

So, it is satisfied.

Q18   Text Solution:

Let in 5 leaps dog covers d unit and in 3 leaps cat covers d units.

Distance covered by the dog in 1 leap $= \frac{d}{5}$ units and distance covered by the cat in 1 leap $= \frac{d}{3}$ units.

And, in t second dog covers 8 leaps and the cat covers 10 leaps.

Distance covered by the dog in 8 leaps $= \frac{8d}{5}$ units and distance covered by the cat in 10 leaps $= \frac{10d}{3}$ units.

Speed of dog $= \frac{8d}{5t}$ and speed of cat $= \frac{10d}{3t}$

Required ratio $= \frac{8d}{5t} : \frac{10d}{3t} = 12 : 25$

Q19   Text Solution:

$Y = 1260 \div 6 \times 3 - 42$

$Y = 210 \times 3 - 42$

$Y = 630 - 42$

$Y = 588$

The relative speed of train P and Q = x + x + 9 = 2x + 9 km/h

We know,

Distance = Speed × Time

588 = (2x + 9) × 12

$2x + 9 = \frac{588}{12}$

$2x + 9 = 49$

$2x = 40$

$x = 20$

Speed of the train Q = 20 + 9 = 29 km/h

Q20   Text Solution:

Let, the time taken by Varun to pass the car = x hours

So, distance traveled by the car in x hours = 80x km

Therefore, $\frac{x}{2} \left[2 \times 65 + (x - 1) \times 5\right] = 80x$

$\Rightarrow \frac{1}{2}[130 + 5x - 5] = 80$

$\Rightarrow \frac{125}{2} + \frac{5x}{2} = 80$

$\Rightarrow 125 + 5x = 160$

$\Rightarrow 5x = 35$

$\Rightarrow x = 7$

So, after 7 hours, Varun would have passed the car.

The speed of Varun when he passed the car = 65 + (7 − 1) × 5 = 65 + 30 = 95 km/h

Required distance = (95 − 80) × 2 = 15 × 2 = 30 km

Hence, option B is answer.

Q21   Text Solution:

Distance between his house and his office $= 75 \times 6 = 450$ miles.

One-third of the distance $= \frac{450}{3} = 150$ miles.

Required average speed = total distance/ total time $= \frac{2 \times 450}{\frac{150}{30} + 2} = \frac{900}{7} = 128.57$ miles/hour.

Q22   Text Solution:

12.5% of 80 = 10

Reduced speed of = 80 – 10 = 70 km/hr

$\frac{120}{80} + \frac{x}{70} = 5.5$

$\frac{x}{70} = 5.5 - 1.5$

$\frac{x}{70} = 4$

$x = 280\ km$

Total distance between Gurgaon and Agra =

120 + 280 =400 km

Distance covered by Rahul in 2 hours

$= 80 \times 2 = 160\ km$

Required   time   =

$2 + \frac{400-160}{70} = 2 + \frac{240}{70} = 2 + 3 + \frac{3}{7} = 5\frac{3}{7}$

hours

Q23 Text Solution:

Given:

Time taken by Aman to complete one round of

the circular field,

$= \frac{180}{2} = 90\ minutues$

Time taken by Beena to complete one round of

the circular field,

$= \frac{180}{2.5} = 72\ minutues$

Time taken by Chetan to complete one round of

the circular field,

$= \frac{180}{3} = 60\ minutues$

L.C.M of 90, 72, 60=360 minutes$=\frac{360}{60} = 6\ hours$

Level-3

Q1 **Text Solution:**

Speed of car $= \frac{700}{10} = 70 \; kmph$

Speed of bus $= \left(\frac{6}{7}\right)70 = 60 \; kmph$

Speed of train $= \left(\frac{7}{6}\right)60 = 70 \; kmph$

Required ratio

$= (20 \times 70) : (70 \times 10) = 2 : 1$

Q2 **Text Solution:**

Speed of B $= x - 10 \; kmph$.

Distance between P and Q $= 5x + 20 \; km$.

Speed of A = x kmph

Relative speed of A and B

$= x + x - 10 = 2x - 10 \; kmph$

Time taken by B to meet A = 3 hours

$\frac{(5x+20)}{2x-10} = 3$

$6x - 30 = 5x + 20$

$x = 50$

Q3 **Text Solution:**

Speed of A $= x \; km/hr$

Speed of car B $= (x - 60) \; km/hr$

Distance between P and Q $= x + 120 \; km$

Time taken by car B to meet car A = 2 hr

$\frac{(x+120)}{x+x-60} = 2$

$(x + 120) = 2[2x - 60]$

$x + 120 = 4x - 120$

$x = 80$

∴ Hence the answer is 80.

Q4 **Text Solution:**

Let the speed of A to reach Q after the meeting be x hr.

Speed of B = x

Speed of A = x + 15

$\frac{S_B}{S_A} = \sqrt{\frac{T_A}{TB}}$

$\frac{x^2}{(x+15)^2} = \frac{1}{x+11}$

$x^2 + 30x + 225 = x^3 + 11x^2$

$x^3 + 10x^2 - 30x = 225$

$x = 5$

Q5 **Text Solution:**

Let the speed of A to reach Q after the meeting be x hr.

Speed of B = 3kmph

Speed of A = 4 kmph

$\frac{S_B}{S_A} = \sqrt{\frac{T_A}{T_B}}$

$\left(\frac{3}{4}\right)^2 = \frac{9}{16} = \frac{x+2.5}{x+6}$

9x + 54 = 16x + 40

$7x = 14$

$x = 2$

Q6 **Text Solution:**

Let speed of train A be 'Y' m/sec.

And speed of train B be 'Y+10' m/sec.

According to question,

$\frac{X + 250}{Y} = 45$..........(i)

And

$\frac{500 + 150}{Y + 10} = \frac{65}{3}$

30 − 10 = Y

Y = 20

Putting value of Y in (i)

$\frac{X + 250}{20} = 45$

900 − 250 = X

X = 650

Boat cover total distance = $3 \times \frac{650}{5}$ = 390 km

Speed of boat in still water = $20 \times \frac{18}{5} \times \frac{25}{100}$ = 18 km/hr

Let speed of current be V km/hr

According to question,

$\frac{390}{18-V} = 30$

13 = 18 − V

V = 5 km/hr

Q7 **Text Solution:**

Let speeds of bus P and bus Q are '3x' km/h and '4x' km/h respectively.

Since, time taken by bus P to reach point B is 2.5 hours more than that taken by bus Q to reach point B.

So,

$\left(\frac{648}{3x}\right) - \left(\frac{648}{4x}\right)$ = 2.5

$\left(\frac{216}{x}\right) - \left(\frac{162}{x}\right)$ = 2.5

$\frac{54}{x}$ = 2.5

x = 21.6

Speed of bus P = 3 × 21.6 = 64.8 km/h

Speed of bus Q = 4 × 21.6 = 86.4 km/h

Time taken by bus P to reach point B = $\frac{648}{64.8}$ = 10 hours

Time taken by bus Q to reach point B = $\frac{648}{86.4}$ = 7.5 hours

From M,

If speed of bus P were 15% less than its original speed.

So, new speed of bus P would be = 85% of 64.8 = 55.08 km/h

And time taken by bus P to reach point B would be = $\frac{648}{55.08}$ = 11.76 hours (approximately) = 11 hours 46 minutes (approximately)

The time, at which bus P will reach point B = 12:16 AM (on next day)

So, M is true.

From N,

Speed of bus P = 3 × 21.6 = 64.8 km/h

Speed of bus Q = 4 × 21.6 = 86.4 km/h

Required difference = (86.4 − 64.8) × $\left(\frac{5}{18}\right)$ = 6 m/s

So, N is not true.

From O,

Time taken by bus Q to reach point B = 7.5 hours = 7 hours 30 minutes

So, the time, at which bus Q will reach point B = 10:00 PM

So, O is not true.

Hence, only M is true.

Q8 Text Solution:

According to the question,

25x − {(15 + 5x)(x − 4)} = 60

Or, 30x − 5X^2 = 0

Or, 5x(x − 6) = 0

Or, x = 0, 6

Or, x = 6 (since time cannot be zero)

Therefore, distance covered by him with a speed of 25 km/hr = 25x = 150 km

For I:

Distance covered by him with a speed of 25 km/hr = (X^2 + 114) = (114 + 36) = 150 km

Therefore, I can be the answer:

For II:

Distance covered by him with a speed of 25 km/hr = (20x + 40) = (120 + 40) = 160 km

Therefore, II cannot be the answer.

For III:

Distance covered by him with a speed of 25 km/hr = (40x − 90) = (240 − 90) = 150 km

Therefore, III can be the answer.

Hence, the correct option is E.

Q9 Text Solution:

Let speed of train A be 'Y' m/sec.

And speed of train B be 'Y+10' m/sec.

According to question,

$\frac{X + 250}{Y}$ = 45...........(i)

And

$\frac{500 + 150}{Y + 10}$ = $\frac{65}{3}$

30 − 10 = Y

Y = 20

Putting value of Y in (i)

$\frac{X + 250}{20}$ = 45

900 − 250 = X

X = 650

Boat cover total distance = 2 × $\frac{650}{13}$ = 100 km

Speed of train B = (Y+10) × $\frac{18}{5}$ = 30 × $\frac{18}{5}$ = 108 km/hr

Speed of current = 108 × $\frac{1}{18}$ = 6 km/hr

According to question,

$\frac{100}{U − 4 + 6}$ = $\frac{20}{3}$

U + 2 = 15

U = 13

Q10 Text Solution:

According to question,

Distance travelled by P = $\frac{240}{4}$ × 3 = 180 km

Distance travelled by Q = 240 − 180 = 60 km

Now,

$\frac{180}{Y + 30} + \frac{60}{Y} = \frac{21}{2}$

7Y^2 + 50Y − 1200 = 0

Possible value of Y = 10

Value of Z = 30 + 10 = 40 km/h

Value of M = $\frac{180}{40}$ = 4.5 hours

Value of N = 10.5 − 4.5 = 6 hours

I. (2Z + 3Y) = 110

(2 ×40 + 3 × 10) = 110

This statement is true

II. Distance travelled by a person running at (Y + 10) km in M hours is 90 km

Required distance = 20 × 4.5 = 90 km

This statement is true.

III. $\frac{Z}{Y} = \frac{3}{1}$

$\frac{Z}{Y} = \frac{40}{10} = \frac{4}{1}$

This statement is false

So, only I and II is true

Hence answer is option D

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