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100

Questions on

Time, Speed & Distance

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100 Questions of Time, Speed & Distance

1. A man travels 360 km in 4 hrs, partly by air and partly by train. If he had travelled all the way by air, he would have saved $\frac{4}{5}^{th}$ of the time he was in the train and would have arrived at his destination 2 hours earlier. Find the distance he travelled by air and by train.

1. 360km 2. 100 km 3. 300 km 4. 90 km

2. A man takes 20 minutes to row 12 km upstream which is a third more than the time he takes on his way downstream. What is his speed in still water?

1. 41 km/hr 2. 36 km/hr 3. 42 km/hr 4. 45 km/hr

3. In a km race, if A gives B a start of 20 seconds, A wins by 10 meter. Alternatively, if he gives him a 50 meter start, then they finish together. How many seconds start should A give B, so that they finish together?

1. 30 sec 2. 25 sec 3. 27 sec 4. 33.33 sec

4. A train crosses a tree in 20 seconds and a man cycling at 5 mph in the opposite direction in 18 seconds. What is the length of the train?

1. $\frac{1}{4}$ of a mile 2. $\frac{1}{3}$ of a mile 3. $\frac{3}{10}$ of a mile 4. $\frac{2}{5}$ of a mile

5. A train takes 39 seconds to completely overtake a cyclist traveling at 5 mph. However, it would have taken 6 seconds lesser to completely cross him if he was traveling in the opposite direction. What is the speed of the train?

1. 122 mph 2. 60 mph 3. 180 mph 4. None of these

6. A can give B a start of 5 yards and C a start of 25 yards in a half mile race. What start can B give to C in a mile race? (1 mile = 1760 yards)

1. $20\frac{4}{35}$ 2. $40\ \frac{8}{35}$ 3. $20\frac{8}{35}$ 4. $40\frac{12}{35}$

7. Prem covers the first half of the distance between Delhi and Chandigarh at 45 km/hr and the rest at 55 km/hr. What is the distance between Delhi and Chandigarh, if he took 4 hours to reach Chandigarh?

1. 200 km 2. 198 km 3. 196 km 4. 49.5 km

8. A and B start running from P to Q and immediately return back to P. When B has covered $3/4^{th}$ of the distance from P to Q, he meets A, who is on his return lap. What is the ratio of the speeds at which A and B run?

1. 3 : 2 2. 5 : 3 3. 5 : 4 4. 4 : 3

9. What is the distance between Debu's house and office, if he will reach office late by 20 minutes, traveling at 10 km/hr and will reach early by 15 minutes, traveling at 15 km/hr?

1. 14.5 km 2. 17.5 km 3. 16.5 km 4. 15 km

10. What is the average speed if a man drives 3 hours at 60 km/hr and the next 6 hours at 50 km/hr.?

1. 55 km/hr 2. 52.5 km/hr 3. 53.33 km/hr 4. 56.67 km/hr

11. A and B run around a circular park of circumference 1 km starting simultaneously from the same point and in the same direction at 4 km/hr and 6 km/hr. When they meet again for the first time at the starting point, how many laps would A have completed?

1. 3 2. 2 3. 4 4. 6

12. How long will it take to row 20 km upstream if one can row 10 km in 10 minutes in still water and the same distance in 8 minutes with the stream?

1. 12 min 2. 13.33 min 3. 24 min 4. 26.67 min

13. I cover $^{2}/_{3}^{rd}$ of the distance that I have to travel at 40 km/hr and the remaining at 30 km/hr. What is the average speed at which I cover the entire distance?

1. 34.29 km/hr 2. 35 km/hr 3. 32.72 km/hr 4. 36 km/hr

14. A train travelling at 78 km/hr crosses a girl sitting in a train of length 110 m travelling in the same direction at 42 km/hr in 20 seconds. The length of the faster train is

1. 90 meter 2. 110 meter 3. 200 meter 4. 100 meter

15. A gives B a start of 50 metre in a km race. B gives C a start of 100 m in a km race. What start can A give C in a km race?

1. 855 meter 2. 154.5 meter 3. 845.5 meter 4. 145 meter

16. A is $^{5}/_{3}$ times as fast as B. If A gives B a start of 60 metre, how long should the racecourse be so that both of them finish the race at the same time?

1. 90 metre 2. 72 metre 3. 132 metre 4. 150 metre

17. In a game of billiards, A can give B 12 points in 60 and A can give C 10 in 90. How many points can C give B in a game of 70?

1. 6.5 2. 6.75 3. 8 4. 7

18. Two cyclists do the same journey by travelling at 9 and 10 km/hr respectively. Find the distance travelled when one takes 32 minutes longer than the other.

1. 44 km 2. 48 km 3. 50 km 4. 46 km

19. On a journey across Bombay, a tourist bus averages 10 km/hr for 20 % of the distance, 30 km/hr for 60 % of it and 20 km/hr for the remainder. The average speed for the whole journey was -

1. 24 km/hr 2. 30 km/hr 3. 5 km/hr 4. 20 km/hr

20. Joseph walked 1 km/hr slower than usual and he could return home in $^{9}/_{8}^{th}$ of his usual time. His normal walking rate is

1. 8 km/hr 2. 9 km/hr 3. 10 km/hr 4. 11 km/hr

21. 5 cars, each having a different speed, are going along a 1-lane road, so no passing is possible. Cars are numbered from 1 to 5, with Car 1 being the slowest and 5 the fastest. Eventually, the cars accumulate in packets, with the "fast" cars tailgating the "slow" ones. If the initial order was 1 $\Rightarrow$ 5 $\Rightarrow$ 2 $\Rightarrow$ 4 $\Rightarrow$ 3, how many packets will we end up with?

1. 1 2. 2 3. 3 4. 5

22. If a man walks at 4 km/hr, he misses the bus by 10 minutes. If he walks at 5 km/hr, he reaches 5 minutes before the arrival of the bus. How far is the bus stand?

1. 10 km 2. 12 km 3. 15 km 4. 5 km

23. To travel 600 km, train X takes 8 hours more than train Y. If the speed of train X is doubled, it takes 2 hours less than train Y. The speed of train Y is

1. 50 km/hr 2. 55 km/hr 3. 45 km/hr 4. 60 km/hr

24. Two trains are traveling in opposite directions at 90 kmph and 18 kmph. If the length of the faster train is 600 metre, find the time taken by the faster train to cross a man standing in the slower train.

1. 20 sec. 2. 25 sec. 3. 30 sec. 4. Data inadequate

25. A man walks ***a*** km in ***b*** hours. The time taken to walk 200 metre is

1. $^{ab}/_{200}$ hours 2. $^{200b}/_{a}$ hours 3. $^{b}/_{5a}$ hours 4. $^{a}/_{5b}$ hours

26. Local trains leave from a station at an interval of 15 minutes at a speed of 36 km/hr. A man moving in the opposite direction meets the trains at an interval of 12 minutes. Find the speed of the man.

1. 9 kmph 2. 12 kmph 3. 15 kmph 4. None of these

27. A car travels 192 km at an average speed of x km/hr. A second car travels the same distance at an average speed of $(x + 4)$ km/hr. If the second car arrives 4 hours earlier than the first, the speed of the former is

1. 15 km/hr 2. 12 km/hr 3. 24 km/hr 4. 16 km/hr

28. The first third of a 75 km trip took twice as long as the rest of the trip. If the first third took h hours, then the average speed for the whole trip was

1. $\frac{50}{h}$ kmph 2. $\frac{75}{2h}$ kmph 3. $\frac{25}{2h}$ kmph 4. $\frac{225}{2h}$ kmph

29. A car takes 5 hours to travel a certain distance. If it had increased its speed by 8 km/hr, then it would have taken 3 hours. The distance is

1. 200 km 2. 120 km 3. 60 km 4. 40 km

30. X runs 1½ times as fast as Y. If X gives Y a start of 300 metre, how far must X run before he catches up with Y?

1. 1 km 2. 400 metre 3. 450 metre 4. 900 metre

31. X runs 1 ¼ times as fast as Y. If X gives Y a start of 200 metre, how far would Y have run before he is caught by X?

1. 1 km 2. 500 metre 3. 600 metre 4. 800 metre

32. In a 500 metre race, the ratio of speeds of two contestants A and B is 3 : 4. A has a start of 140 metre, then

1. B wins by 20 metre 2. A wins by 20 metre 3. B wins by 40 metre 4. B wins by 25 metre

33. A hot air balloon covered 2100 miles in 7 days. If it covered 50 miles more each day than the day before, how many miles did it cover on the last day?

1. 350 2. 400 3. 450 4. 500

34. Jack climbed up the beanstalk at a uniform rate. At 2 p.m. he was one-sixth the way up and at 4 p.m. he was three fourths the way up. At what time did he start climbing approximately?

1. 12:45 pm 2. 1:25 pm 3. 1:10 pm 4. 1.20 pm

35. A man rows '*d*' km upstream and back again downstream to the same point in *T* hours. The speed of rowing in still water is *x* km/hr and the rate of stream is *y* km/hr. Then

1. $(x^2–y^2) = 2xd / T$ 2. $(x + y) = dT / (x – y)$ 3. $xy = dT$ 4. None of the above

36. A man rows 40 km upstream in 8 hours and a distance of 36 km downstream in 6 hours. Then the speed of the man in still water is

1. 0.5 km/hr 2. 5.5 km/hr 3. 6 km/hr 4. 5 km/hr

37. A boat goes 12 km upstream in 48 minutes. The speed of stream is 2 km/hr. The speed of boat in still water is

1. 13 km/hr 2. 2.25 km/hr 3. 17 km/hr 4. 15 km/hr

38. A man is walking at a speed of 10 km per hour. After every kilometre, he takes rest for 5 minutes. How much time will he take to cover a distance of 5 km?

1. 55 minutes 2. 50 minutes 3. 60 minutes 4. 45 minutes

39. A train traveling at the speed of 65 kmph leaves Bombay at 10 a.m. and another train traveling at the speed of 75 kmph at 12 noon leaves Bombay, travelling in the same direction. At how many km from Bombay will they be together?

1. 845 km 2. 1000 km 3. 975 km 4. 925 km

40. Without stoppages, a train travels, a certain distance with an average speed of 80 km/hr, and with stoppages, it covers the same distance with an average speed of 60 km/hr. How many minutes per hour does the train stop?

1. 15 min/hr 2. 5 min/hr 3. 10 min/hr 4. 20 min/hr

41. A man covers a certain distance on a toy train. If the train moved 4 km/hr faster, it would have taken 30 minutes less. If it moved 2 km/hr slower, it would have taken 20 minutes more. Find the distance.

1. 40 km 2. 60 km 3. 50 km 4. 72 km

42. A thief is spotted by a policeman from a distance of 400 metre. When the policeman starts the chase, the thief also starts running. Assuming the speed of the thief as 10 km/hr and that of police man as 15 km/hr how far would the thief have run, before he is caught?

1. 1200 metre 2. 600 metre 3. 800 metre 4. 900 metre

43. A car during its journey travels 30 minutes at a speed of 40 km/hr, another 45 minutes at a speed of 60 km/hr and 2 hours at a speed of 70 km/hr. Find its average.

1. 50 km/hr 2. 63 km/hr 3. 55.5 km/hr 4. 48 km/hr

44. If a car travels a distance of 240 km in 6 hours, partly at a speed of 60 km/hr and partly at 30 km/hr, then find the time it travels at 60 km/hr.

1. 2 hours 2. 3 hours 3. 4 hours 4. 4.5 hours

45. Three men go to stay at a motel, and the man at the desk charges them $ 30.00 for a room. They split the cost ten dollars each. Later the manager tells the desk man that he overcharged the men, that the actual cost should have been $ 25.00. The manager gives the bellboy $ 5.00 and tells him to give it to the men. The bellboy, however, decides to cheat the men and pockets some money. Now each man has paid $ 9.00 to stay in the room. How much has the bellboy pocketed?

1. $ 1 2. $ 2 3. $ 3 4. $ 5

46. A man takes 4 hours 30 minutes in walking to a certain place and riding back. He would have gained 1 hour 45 minutes by riding both ways. How long would he take to walk both ways?

1. 2 ¾ hours 2. 5 ½ hours 3. 6 ¼ hours 4. 7 ½ hours

47. 2 kids, John and Jim, are running on an escalator (a moving stairway). John is running three times as fast as Jim, and by the time they are off the escalator, John has stepped on 75 stairs while Jim has stepped on 50 stairs. What is the ratio of the elevator's speed to Jim's speed?

1. 1: 1 2. 3 : 1 3. 2 : 1 4. 2 : 3

48. A thief goes away with a Maruti car at a speed of 40 km/hr. The thief has been discovered after half an hour and the owner sets off in another car at 50 km/hr. When will the owner overtake the thief, from the time the thief made his start?

1. 1 hour 2. 2 hours 3. 2 ½ hours 4. 48 minutes

49. A long distance runner runs 9 laps of a 400 metre track every day. His timings (in minutes) for four consecutive days are 88, 96, 89 and 87 respectively. On an average, how many metre/minute does the runner cover?

1. 40 metre 2. 44 metre 3. 38 metre 4. 90 metre

50. A jet is flying 2400 miles from Hawaii to San Francisco. In still air, it flies at 600 mph. There is a 40 mph tailwind in the same direction. Exactly how many hours after takeoff would it becomes neutral for the plane to either go to San Francisco or to return to Hawaii in the case of an emergency?

1. 1.25 hours 2. 1.5 hours 3. 1.75 hours 4. 2 hours

51. The ratio between the speeds of A and B is 4 : 5. If A takes 20 minutes more than B to cover a distance, find the actual time taken by A.

1. 60 minutes 2. 75 minutes 3. 80 minutes. 4. 100 minutes

52. Normally it takes 3 hours for a train to run from A to B. One day, due to a minor trouble the train had to reduce the speed by 12 km/hr and so it took ¾ of an hour more than usual. What is the distance from A to B?

1. 240 km 2. 160 km 3. 150 km 4. 180 km

53. Joe was driving on the highway. A car ahead of him was driving far below the speed limit so he decided to pass. In the first second he gained 5 m on the car and as he accelerated he gained 1.5 times as much distance in each second, as he had the second before. If there was 30 m between Joe and the car he was passing, then approximately how long did it take him to pass?

1. 3 s 2. 4 s 3. 5 s 4. 6 s

54. Two men start walking a certain distance together, one at 4 km/hr and another at 3 km/hr. The former arrives half an hour before the latter. Find the distance.

1. 8 km 2. 4 km 3. 6 km 4. 9 km

55. Two men undertake to drive a distance of 54 km. The first performs the journey at 8 km/hr. The second, starting half an hour later, arrives 15 minutes sooner. Find the approximate ratio of the speeds of the first to the second person.

1. 7 : 8 2. 6 : 7 3. 9 : 8 4. 8 : 9

56. A can give B 20 m and C 25 m in a 100 m race, while B can give C one second over the course. How long does A take to run 100 m?

1. 22 sec 2. 32 sec 3. 12 sec 4. 42 sec

57. In a game of billiards, A can give B 12 points in 60 and A can give C 10 in 90. How many can C give B in a game of 70?

1. 6 2. 7 3. 8 4. 9

58. A runs 1.75 times as fast as B. If A gives B a start of 60 m, how far must the winning post be in order that A and B reach at the same time ?

1. 240 m 2. 140 m 3. 260 m 4. 280 m

59. In a 100 m race, A runs at 6 km/hr. If A gives B a start of 4 m and still beats him by 12 seconds, what is the speed of B?

1. 2.8 km/hr 2. 3.6 km/hr 3. 4.8 km/hr 4. 5.2 km/hr

60. Two trains of length 100 m and 80 m respectively run on parallel railway lines. When running in the same direction the faster train passes the slower one in 18 seconds, but when they are running in opposite directions with the same speeds as earlier, they pass each other in 9 seconds. Find the speed of slower train.

1. 25 m/sec 2. 20 m/sec 3. 15 m/sec 4.5 m/sec

61. A train overtakes two persons. They are walking in the same direction as the train at the rate of 2 km/hr and 4 km/hr. The train passes them completely in 9 and 10 seconds respectively. Find the length of the train.

1.250 m 2. 200 m 3. 50 m 4. 150 m

62. Find the length of a bridge, which a train 130 m long, travelling at 45 km an hour, can cross in 30 seconds.

1. 360 m 2. 245 m 3. 140m 4. 320 m

63. Two stations A and B are 110 km apart on a straight line. One train starts from A at 7 a.m. and travels towards B at 20 km per hour speed. Another train starts from B at 8 a.m. and travels towards A at a speed of 25 km per hour. At what time will they meet?

1. 9 am 2. 10 am 3. 11 am 4. 12 am

64. A man can row 30 km upstream and 44 km downstream in 10 hrs. Also, he can row 40 km upstream and 55 km downstream in 13 hours. Find the rate of the current.

1. 3 km/h 2. 4 km/h 3. 5 km/h 4. 6 km/h

65. A train running at 25 km/hr takes 18 seconds to pass a platform. Next it takes 10 seconds to pass a man walking at the rate of 7 km/hr in the same direction. Find the length of the platform and the length of the train.

1. 25, 50 2. 75, 50 3. 75, 100 4. 25, 100

66. A train running at 36 km/hr takes 12 seconds to pass a platform. Next it takes 6 seconds to pass a man running at the rate of 9 km/hr in the opposite direction. Find the length of the train and the length of the platform.

1. 25, 50 2. 45, 50 3. 75, 45 4. 25, 100

67. A toy train crosses 210 and 122 metre long tunnels in 25 and 17 seconds respectively. Find the train's length.

1. 65 m 2. 70 m 3. 75 m 4. 80 m

68. A 150 metre long train crosses a bridge of length 250 metre in 30 seconds. Find the time the train takes to cross a platform 130 metre long.

1. 36 sec 2. 21 sec 3. 54 sec 4. 27 sec

69. A train traveling at 90 km/hr crosses a bridge in 36 seconds. Another train 100 metre shorter crosses the same bridge at 45 km/hr. Find the time taken by the second train to cross the bridge.

1. 36 sec 2. 45 sec 3. 64 sec 4. 27sec

70. Two trains, 130 and 110 metre long, are going in the same direction. The faster train takes one minute to pass the other completely. If they are moving in opposite directions, they pass each other completely in 3 seconds. Find the speed of the trains respectively (in m/sec).

1. 42, 38 2. 40, 38 3. 54, 38 4. 38, 42

71. A bullock cart 5 metre long is crossing a bridge 235 metre long. If the speed of bullock cart is 4.8 km/hr, find in what time will it pass the bridge?

1. 3 min 2. 4 min 3. 5 min 4. 7 min

72. Local trains leave from a station at intervals of 14 minutes at 36 km/hr. A man moving in the same direction along the road meets the trains at intervals of 18 minutes. Find the speed of the man.

1. 8 km/hr 2. 5 km/hr 3. 6 km/hr 4. 9 km/hr

73. A train crosses a man running at 9 km/hr in 40 seconds and another man running at 6 km/hr in 30 seconds. Find the speed of train, if both men are running in the same direction as the train.

1. 36 km/hr 2. 65 km/hr 3. 18 km/hr 4. 27 km/hr

74. Two trains start from Delhi and Poona towards each other at 7 a.m. with speeds of 85 kmph and 67 kmph respectively. They cross each other at 3.30 p. m. What is the distance between Delhi & Poona?

1. 3,612 km 2. 1,245 km 3. 1292 km 4. 2,700 km

75. A motorboat can travel at 10 km/hr in still water. It travelled 91 km downstream in a river and then returned, taking altogether 20 hours. Find the rate of flow of the river.

1. 6 km/h 2. 5 km/h 3. 4.5 km/h 4. 3 km/h

76. A boatman can row 1 ½ km against the stream in 22 ½ minutes and return in 15 minutes. Find the rate of flow of the current.

1.2 km/h 2. 1 km/h 3. 3 km/h 4. 5 km/h

77. A man can row 36 km upstream in 6 hours. If the speed of the man in still water is 8 km/hr, find how much he can row downstream in 10 hours.

1. 100 km 2. 150 km 3. 200 km 4. 250 km

78. The speed of a boat in still water is 4 km/hr and the speed of the current is 2 km/hr. If the time taken to reach a certain distance upstream is 9 hours, find the time it will take to go the same distance downstream.

1. 3 hrs 2. 4 hrs 3. 5 hrs 4. 6 hrs

79. A man can row 6 km/hr in still water. If the river is running at 2 km/hr, it takes 3 hours more to go from A to B upstream than to go downstream from B to A. How far is A from B?

1. 36 km 2. 45 km 3. 24 km 4. 27 km

80. A man rows to a place 48 km distant and back in 14 hours. He finds that he can row 4 km with the stream in the same time as 3 km against the stream. Find the rate of flow of the stream.

1. 2 km/hr 2. 1 km/hr 3. 5 km/hr 4. 7 km/hr

81. X, Y, and Z are the three contestants in a kilometre race. If X can give Y a start of 50 metre and X can also give Z a start of 69 metre, how many metre start can Y give Z?

1. 36 m 2. 18 m 3. 54 m 4. 20 m

82. In a 400 metre race, A gives B a start of 5 seconds and beats him by 15 metre. In another race of 400 metre, A beats B by $7\ ^1/_7$ seconds. Find the speed of A.

1. 6 m/sec 2.5 m/sec 3. 8 m/sec 4. 9 m/sec

83. A can run a kilometre in half a minute less time than B. In a kilometre race, B gets a start of 100 metre and loses by 25 metre. Find the time B take to run a kilometre.

1. 8 min 2. 4 min 3. 6 min 4. 5 min

84. A and B ran a km race and A wins by 60 seconds. A and C run a km and A wins by 375 metre, B and C run a km and B wins by 30 seconds. Find the time that C takes to run a km

1. 360 sec 2. 450 sec 3. 240 sec 4. 270 sec

85. A takes 4 minutes 50 seconds, while B takes 5 minutes to complete a race. A beats B by $33\ ^1/_3$ metre. Find the length of the course.

1.136 m 2. 1450 m 3. 5400 m 4. 1000 m

86. A man covers a certain distance between his house and office on scooter. If he travels an average speed of 30 km/hr, he is late by 10 min. However, with a speed of 40 km/hr he reaches his office 5 minutes earlier. Find the distance between his house and office.

1. 15 km 2. 30 km 3. 45 km 4. 60 km

87. Running $^4/_3$ of his usual speed, a person improves his timing by 10 minutes. Find his usual time to cover the distance.

1. 20 min 2. 30 min 3. 40 min 4. 60 min

88. Two men A and B walk from P to Q, a distance of 21 km at 3 and 4 km an hour respectively. B reaches Q, returns immediately and meets A at R. Find the distance from P to R.

1. 18 km 2. 36 km 3. 72 km 4. 144 km

89. A man sets out to cycle from Delhi to Rohtak, and at the same time another man starts from Rohtak to cycle to Delhi. After passing each other, they complete their journeys in $3\frac{1}{3}$ and $4\frac{4}{5}$ hours respectively. At what speed does the second man cycle if the first cycles at 8 km per hour?

1. $6\frac{3}{2}\text{km/hr}$ 2. 6 km/hr 3. $6\frac{1}{4}\text{km/hr}$ 4. $6\frac{2}{3}\text{km/hr}$

90. Two guns were fired from the same place at an interval of 13 minutes. A person in a train approaching the place hears the second fire 12 minutes 30 seconds after the first. Find the speed of the train, assuming that sound travels at 330 meter per second.

1. $13\frac{47}{25}\text{km/hr}$ 2. $47\frac{13}{25}\text{km/hr}$ 3. 47 km/hr 4. None of these

91. A carriage driving in a fog passed a man who was walking at the rate of 3 km an hour in the same direction. He could see the carriage for 4 minutes and it was visible to him up to a distance of 100m. What was the speed of the carriage?

1. 3.5 km/hr 2. 3 km/hr 3. 4.5 km/hr 4. 4 km/hr

92. A monkey tries to ascend a greased pole 14 metre high. He ascends 2 metre in the first minute and slips down 1 metre in alternate minutes. If he continues to ascend in this fashion, how long does he take to reach the top?

1. 10 min 2. 20 min 3. 30 min 4. None of these

93. Two runners cover the same distance at the rate of 15 km and 16 km per hour respectively. Find the distance travelled when one takes 16 minutes longer than the other.

1. 64 km 2. 32 km 3. 16 km 4. 8km

94. Two cars run to a place at the speeds of 45 km/hr and 60 km/hr respectively. If the second car takes 5 hrs less than the first for the journey, find the length of the journey.

1. 10 km 2. 300 km 3. 900 km 4. 1800 km

95. A man takes 8 hours to walk to a certain place and ride back. However, he could have gained 2 hrs, if he had ridden both ways. How long would he have taken to walk both ways?

1. 8 2. 9 3. 10 4. 11

96. A person has to cover a distance of 80 km in 10 hrs. If he covers half of the journey in $^3/_5$ of the time, what should be his speed to cover the remaining distance?

1. 5 km/hr 2. 10 km/hr 3. 20 km/hr 4. 40 km/hr

97. Three boys, A, B and C start jogging from the same point simultaneously in the same direction at 3 mph, 5 mph and 6 mph respectively on a circular path of diameter 161 yards. After what time will they meet again? (1 mile = 1760 yards)

1. 1035 sec 2. 900 sec 3. 15 min 25 sec 4. 1075 seconds

98. The wheel of an engine $4\frac{2}{7}$ metre in circumference makes seven revolutions in 4 seconds. Find the speed of the train in km per hour.

1. 9 km/hr 2. 18 km/hr 3. 27 km/hr 4. 36 km/hr

99. Two boys begin together to write out a booklet containing 8,190 lines. The first boy starts with the first line, writing at the rate of 200 lines per hour; the second boy starts with the last line, then writes the 8189^{th} line and so on, proceeding backward at the rate of 150 lines an hour. At what line will they meet?

1. 4860^{th} 2. 4608^{th} 3. 4680^{th} 4. None of these

100. A thief is spotted by a policeman from a distance of 200 metre. When the policeman starts the chase, the thief also starts running. Assuming the speed of the thief to be 10 kmph, and that of the policeman to be 12 kmph, how far would the thief have run before he is overtaken?

1. 0.5km 2. 1 km 3. 2 km 4. 4km

Answer keys & Explanations

1.	4	Total distance traveled = 360 km. Total time taken = 4 hrs. Now $\frac{4}{5}$ (Total time in train) = 2 $\Rightarrow$ total time in train = 2 × 5 / 4 = 5 / 2 hrs. $\therefore$ Total time in air = 4 – 5 / 2 = 3 / 2 hrs. So in 2 hrs, it would have covered 360 km. by air. So total distance in air = 360 / 2 × 3 / 2 = 270 km. Hence distance traveled by train = 360 – 270 = 90 km.
2.	3	Let the speed in still water = x km/hr. Takes 20 min. to row 12 km upstream $\Rightarrow$ speed of u/s = 36 km/hr. Also time taken for u/s is $\frac{1}{3}$ more than for d/s. $\therefore$ distance covered in d / s will be 1 / 3 more. Hence distance covered by man for d / s in 20 min. = 12 + $\frac{12}{3}$ = 16km. So speed of d / s = 48 km/hr. $\therefore$ $x + y = 48$ and $x - y = 36$ $\Rightarrow$ x = 42 km/hr.
3.	2	From the 2 relationships given, we can infer that B covers 50 – 10 = 40 m in 20 sec. $\therefore$ B covers 50 m in $20 \times \frac{5}{4} = 25\text{sec}$. $\therefore$ A should give 25 sec. start to B, so that they finish together.
4.	1	Let the speed of the train be x mph and length of train = L miles. $\therefore$ x = 180 L. Also, cycle is in opposite direction. $\therefore$ Relative speed = x + 5. So $\frac{18}{60\times60} = \frac{L}{x+5} \Rightarrow 200L = x+5 \Rightarrow 200L = 180L + 5 \therefore L = \frac{1}{4} mile.$
5.	2	Let x be the length of train and y be the speed of train. $\therefore$ $\frac{39}{60\times60} = \frac{x}{y-5}$ and $\frac{33}{60\times60} = \frac{x}{y+5}$. Solving these 2 equations, we get y = 60 m/hr.
6.	2	A gives B a start of 5 yards in a half – mile race i.e. 880 yards. A covers 880 yards, B covers 875 yards. A gives 25 yards start to C i.e. C covers 855 yards. $\therefore$ When B covers 1760 yards (1mile), C covers $\frac{855}{875}\times1760 = \frac{60192}{35}$ yards $\therefore$ B can give C start of $1760 - \frac{60192}{35}$ i.e. $\frac{1408}{35} = 40\frac{8}{35}$ yards in a mile race.
7.	2	Let the required distance be $2x$. $\therefore$ Half i.e. x is covered at 45km/hr and other half at 55 km/hr. $\therefore$ $\frac{x}{45} + \frac{x}{55} = 4 \Rightarrow$ x = 99 $\therefore$ required distance = 99 × 2 = 198 km.
8.	2	Ratio of timing of A and B = $\frac{3}{4}:1+\frac{1}{4} = 3:5.$ Hence their speed ratio = 5:3.
9.	2	Difference in timing = 15 – (–20) = 35 min. Let required distance = x. $\therefore$ $\frac{x}{10} - \frac{x}{15} = \frac{35}{60} \Rightarrow$ x = 17.5 km.

10.	3	Average speed = $\frac{\text{Total distance}}{\text{Total time}} \Rightarrow \frac{(3\times 60)+(6\times 50)}{3+6} = \frac{480}{9} = 53.33$ km/hr.
11.	2	Time taken by *A* to cover the whole circumference = $\frac{1}{4}$ hrs and for *B*, time taken = $\frac{1}{4}$ hrs. Hence they would be together after LCM of $\frac{1}{4} and \frac{1}{6}$ i.e. $\frac{1}{2} hrs.$ So at the meeting point, *A* would have completed $\frac{1}{2}\times 4 = 2$ laps.
12.	4	Let *x* be the speed of man in still water and *y* be the speed of stream. ∴ Speed of man (*x*) = 60 km/hr and speed of stream = 75 km/hr. (downstream) ∴ Speed of stream = 15 km/hr. Hence upstream speed = 60 – 15 = 45 km/hr. So time taken to cover 20 km = $\frac{20}{45}\times 60 = 26.67$ min.
13.	4	Average speed = $\frac{\text{Total distance}}{\text{Total time}}$. Let the total distance = *D*. ∴ Average speed = $\frac{D}{\left(\frac{2D}{3}\times\frac{1}{40}\right)+\left(\frac{D}{3}\times\frac{1}{30}\right)} = \frac{D}{\frac{D}{60}+\frac{D}{90}} \Rightarrow \frac{D\times 180}{5D} \Rightarrow 36 km/hr.$
14.	3	Let the length of the faster train = *x*. ∴ $\frac{(x)18}{(78-42)5} = 20 \Rightarrow x = 200$ meters.
15.	4	*A* covers 1000 m. *B* covers 950m. When *B* covers 1000 m, *C* covers 900 m. ∴ When *B* covers 950 m, *C* covers $\frac{900}{1000}\times 950 = 855m.$ ∴ *A* can give start of 1000 – 855 = 145 m to *C* in a km race.
16.	4	*A* gains 5 – 3 = 2 *m* in a race of 5 m. He will gain 60 m in a race of 5 × 60/2 = 150m.
17.	4	*A* : *B* = 60 : 48 = 90 : 72 *C* = 90 : 80 *C* : *B* = 80 : 72 = 70 : 63. *C* gives *B* 7 points
18.	2	Let the distance traveled = *x*. ∴ *x* / 9 – *x* / 10 = 32 / 60 ⇒ *x* = 48 km.
19.	4	Let the total distance be 100 km. ∴ Speed for 20 km. = 10 km/hr, speed for 60 km = 30 km/hr and speed for last 20 km. = 20 km/hr. ∴ Average speed for whole journey was $\frac{100}{\frac{20}{10}+\frac{60}{30}+\frac{20}{20}}$ = 100/5 = 20 kmph.
20.	2	Let his normal speed = *x* km/hr. Decreased speed = (*x* – 1) km/hr. If usual time is t hrs, then on decreasing speed, he takes 9 / 8 of his usual time. But distance traveled on both sides is same. ∴ $\frac{9}{8}(x-1)\,t = tx \Rightarrow x = 9$ km/hr.

21.	3	They will end up in 3 packets: {1}, {5, 2} and {4, 3}. The first packet will be (4, 3) as the speed of the fourth car is more than the third car, thus it will be tailgating car no. 3. Thus resulting in one packet. The second packet will be car no. 2 ahead of car no. 5, as the speed of car no. 5 is more than the speed of car no. 2, thus it will be tailgating car no. 2. Mind it will be two separate packets as the speed of car no. 2 is lesser than the speed of car no. 3. Hence first two will move together, second two cars will also move together and the third packet will consist of car no. 1 alone. Now it being the slowest of the lot, it will move behind all the car and will not tailgate will car no. 2 & 5. Thus 3 packets in total.
22.	4	Let required distance = x km. Difference of time = 5– (–10)=15 min. $\therefore \frac{x}{4}-\frac{x}{5}=\frac{15}{60}\Rightarrow x=5$ km
23.	1	Distance to be traveled = 600 km. Let the speed of X be a km/hr and speed of Y be b km/hr. So $\frac{600}{a}-\frac{600}{b}=8.$ Also $\frac{600}{b}-\frac{600}{2a}=2$ $\Rightarrow a$ = 30 km/hr and b = 50 km/hr.
24.	1	As the faster train crosses the man in the slower train, time taken in this case = length of the faster train / Relative speed. Thus time = 600 / 30 = 20 seconds.
25.	3	Speed of man = a / b km/hr. Distance to be traveled = 200 m = 0.2 km. $\therefore$ Time taken = (0.2) / (a / b) $\Rightarrow 0.2b / a$ $\Rightarrow$ b / 5a hours.
26.	1	The distance between two trains is 36×1/4 = 9 km. The man covers the same distance in 12 minutes what the train would have covered in 3 minutes. So his speed is 1/4th that of the train – 36 × ¼ = 9 km/hr.
27.	2	$\frac{192}{x}-\frac{192}{x+4}=4\Rightarrow x=12km/hr.$
28.	1	Time for first third = h hours. Distance covered = 75 / 3 = 25 km. $\therefore$ Remaining distance = 75 – 25 = 50 km. Time taken to cover 50 km = h / 2. $\therefore$ Average for the whole trip = (Total distance) / (Total time) $\Rightarrow$ Average = (75) / (h + h / 2) = 50 / h.
29.	3	Let the distance be x. $\therefore$ speed of train = x / 5. Also distance x = ($\frac{x}{5}+8)3\Rightarrow x$ = 3x / 5 + 24 $\Rightarrow$ 2x / 5 = 24 $\Rightarrow x$ = 60 km.
30.	4	Ratio of speeds between X and Y = 3 : 2. $\therefore$ Let their speeds be 3x and 2x. Let 'a' be the extra distance covered by Y before it is caught by X. $\therefore a$/2x = (300 + a)/3x $\Rightarrow a$ = 600. $\therefore X$ must run 600 + 300 = 900 m before it catches Y.
31.	4	Ratio of speeds between X and Y = 5 : 4 $\therefore$ Their speeds are 5x and 4x. Let b be the extra distance covered by Y before it is caught by X. $\therefore$ b / 4x = ($200 + b$) / 5$x \Rightarrow b$ = 800 m.

32.	2	To reach the winning post, A covers 500 – 140 = 360 m. $\therefore B$ covers 360(4/3) = 480 m when A reaches the winning post. $\therefore A$ wins by 20 m.
33.	3	Average traveled / day is 2100 / 7 = 300 miles. This is the exact distance traveled on the 4^{th} day. So on 5^{th} he will travel 350, 6^{th} will travel 400 and on the 7^{th} day 450.
34.	2	Jack goes from 4 / 24 of the way up to 18 / 24 of the way up in two hours. That's 7 / 12 every two hours. So Jack climbs 7 / 24 of the stalk each hour. He started climbing (1 / 6) / (7 / 24) hours before 2. = 4 / 7 hours before 2. Or at 3 / 7 hours after 1. Convert 3 / 7 into minutes by multiplying with 60 i.e. 60 × 3 / 7 = approximately 1:25.
35.	1	Time taken to cover total distance = T hrs. Speed of upstream = $x - y$. Speed of downstream = $x + y$. $\therefore d / (x - y) + d / (x + y) = \mathrm{T} \Rightarrow \frac{(x+y)d + (x-y)d}{x^2 + y^2} =$ $\mathrm{T} \Rightarrow \frac{2xd}{x^2 - y^2} = \mathrm{T}$ $\Rightarrow (x^2 - y^2) = 2xd / T$.
36.	2	Speed of upstream = 40 / 8 = 5 km / hr. Speed of downstream = 36 / 6 = 6 km / hr. $\therefore$ speed of man in still water = (5 + 6) / 2 = 5.5 km / hr.
37.	3	12 km upstream in 48 min. $\therefore$ it will cover 15 km in 1 hr. Speed of stream = 2 km / hr. $\therefore$ speed of boat in still water = 15 + 2 = 17 km / hr.
38.	2	Speed = 10 km/hr. Total dist. to be covered = 5 km. Time taken to cover 1 km = 6 min. Hence total time taken = 6 + 5 + 6 + 5 + 6 + 5 + 6 + 5 + 6 = 50 min.
39.	3	Distance traveled by 1^{st} train in 2 hrs. = 65 × 2 = 130 km. They are in same direction. $\therefore$ Relative speed = 75 – 65 =10 km / hr. Time taken to meet = 130 / 10=13 hrs. $\therefore$ Distance from Bombay = 13 × 75 = 975 km.
40.	1	Speed without stoppages = 80 km/hr. Speed with stoppages = 60 km/hr. $\therefore$ Min. per hour the train stops $= \frac{80-60}{80} \times 60 = 15 \min/hr.$
41.	2	Let the distance be D km. Speed of the train be x km / hr and normal time is t hrs. $\therefore D / x + 4 = t -$ $\frac{30}{60} \Rightarrow D / x + 4 = t - 1/2.$ Also $D / x - 2 = t + \frac{20}{60} \Rightarrow D / x - 2 = t + \frac{1}{3}$ Also $D = tx$. Solving these 3 equations, we get D = 60 km.
42.	3	Let the thief ran x km before he is overtaken. Speed of thief = 10 km/hr. Speed of policeman = 15 km/hr. $\therefore (0.4 + x)/15 = x/10 \Rightarrow x$ = 0.8 km = 800 m.

43.	2	Average speed = (Total distance) / (Total Time) $\Rightarrow = \dfrac{\dfrac{(1/2\times 40)+(3/4\times 60)+(2\times 70)}{1/2+3/4+2}}{13/4}$ $= 63 km/hr.$
44.	1	Let it traveled for x hours at 60 km / hr. $\therefore$ it traveled for $(6 - x)$ hours at 30 km / hr. Hence $x\ (60) + (6 - x)\ (30) = 240 \Rightarrow x = 2$.
45.	2	Now each of the men got back \$ 1, since the men had earlier paid \$ 10 each. So they were paid \$ 3 out of the \$ 5. So the bellboy kept \$ 2.
46.	3	$W + R = 4.5$. $R + R = 4.5 - 1.75 = 2.75$ $\Rightarrow R + R = 11/4 \Rightarrow R = 11/8$ hrs. $\therefore W = 9/2 - 11/8 \Rightarrow W = 25/8$ hrs. Hence $W + W = 25/4 = 6\ 1/4$ hrs.
47.	1	Let the speed of escalator be E steps for every step of Jim. Now in the same time John will move 3 steps, this means escalator moves E steps for every 3 steps of John or it moves $E/3$ steps for every step of John. The escalator has the same number of steps. $\Rightarrow 75 + 75E/3 = 50 + 50E$ $\Rightarrow 75 - 50 = 50E - 25E$ $\Rightarrow$ E = 1. This means escalator has the same speed as that of Jim. Thus answer is 1 : 1. Hence first option.
48.	3	Speed of thief = 40 km/hr. $\therefore$ Distance covered by thief in half an hour = 20 km. Speed of owner = 50 km/hr. Let the thief ran x km before he caught. $\therefore x / 40 = (20 + x)/50 \Rightarrow x = 80$ km. $\therefore$ Thief had run 100 km. Hence time taken by the owner from the start of the thief = 100 / 40 = 2.5 hrs.
49.	1	Total timings for the 4 days = 88 + 96 + 89 + 87 = 360 min. $\therefore$ Average metres / min will be 360 / 9 = 40.
50.	3	Flying to San Francisco, the plane's speed is 640 mph. If it were flying back to Hawaii, its speed would be 560 mph. Let t be the number of hours of flight after which it reaches at that stage. Then it has flown a distance of $640t$ miles and the distance yet to go is $2400 - 640t$. The time left to fly is then $(2400 - 640t) / 640$. However, if it were to return to Hawaii, it would have to fly $640t$ miles at 560 mph which would then take $640t / 560$ hrs. If we equate these times we have $(2400 - 640t) / 640$ $= 640t / 560$. If you solve this for t you get $t = 1.75$ hr.
51.	4	Ratio of speeds = 4 : 5. $\therefore$ Ratio of time taken = 5 : 4. $\therefore 5x - 4x = 20 \Rightarrow x = 20$. $\therefore$ Actual time taken by $A = 20 \times 5 = 100 \min$.
52.	4	Normal time = 3 hrs. Increased time = 3 + ¾ = 15 / 4 hours. Let the distance from A to B is x. $\therefore (x / 3 - 12)(\frac{15}{4}) = x$ $\Rightarrow 1.25x - 45 = x \Rightarrow x = 180$ km.

53.	2	t dist 1s 5 m 2s 7.5 m 3s 11.25 m 4s 16.875 m It can be seen that sum of all the gained distance at the end of 4 seconds becomes more than 30. Thus in 4 seconds he will pass the car.
54.	3	Let the distance be x km. $\therefore \frac{x}{3}-\frac{x}{4}=\frac{1}{2}\Rightarrow\frac{x}{12}=\frac{1}{2}\Rightarrow x=$ 6 km.
55.	4	Distance to be covered = 54 km. Speed of 1st = 8 km/hr. $\therefore$ Time taken by 1st person = 54/8 = 6 ¾ hrs. Hence time taken by 2nd person = 6 ¾ – ½ – 15/60 = 6hrs. $\therefore$ their timing ratio = 27/4 : 6 $\Rightarrow$ 9 : 8. Hence ratio of their speeds = 8 : 9.
56.	3	A runs 100m. $\therefore$ B runs 80m and C runs 75m. $\Rightarrow$ When B runs 100m, C runs 75/80 × 100 = 93.75m. Hence C covers 100 – 93.75 = 6.25m in 1 sec. So C takes 100/6.25 = 16 sec to run 100 m. B will take 15 sec to run 100 m. $\therefore A$ will take 15 × 80/100 = 12 sec.
57.	2	A has 60 points. B has 48 points. A has 90 points. C has 80 points $\Rightarrow$ When A has 90 points, B has 48 / 60 × 90 = 72 points. Also when C has 70 points, B has 72 / 80 × 70 = 63 points. $\therefore$ C can give B 7 points in a game of 70.
58.	2	Let the winning post be at a distance of D metres. Let speed of $B = x$. $\therefore$ speed of $A = 1.75x$. A gives B a start of 60 m. $\therefore \frac{D-60}{x}=\frac{D}{1.75x}\Rightarrow D=140m.$
59.	3	Speed of A = 6 km / hr = 6 × 5 / 18 = 5 / 3 m / sec. Let speed of $B = x$ m/sec. A gives B a start of 4 m and still beats B by 12 sec. $\therefore \frac{96}{x}-\frac{100\times3}{5}=12\Rightarrow\frac{96}{x}=72$ $\Rightarrow x=4/3m/s=4.8km/hr.$
60.	4	L_1=100 m, L_2= 80 m. Time taken when trains are in same direction = 18 sec. Time taken when trains are in opposite direction = 9 sec. Let speed of 1st train be x m/sec and speed of 2nd train be y m / sec. $\therefore x - y$ = (100 + 80) / 18 $\Rightarrow x - y = 10$. Also $x + y$ = (100 + 80) / 9 = 20. $\therefore$ x = 15 m / sec. and y = 5 m / sec.

61.	3	Rates of persons = 2 km/hr and 4 km / hr. Time taken to pass them = 9 and 10 sec. Let speed of train = x m/sec. and length of the train = L metres. 2 km / hr. = 2 × 5/18 = 5/9 m/sec. ‘ 4 km/hr = 4 × 5/18 = 10 / 9 m/sec. $\therefore (x - 5/9)\,9 = (x - 10/9)10 \Rightarrow x = 55/9$ m/sec. = 22 km/hr. Also length of train = (55 / 9 – 5 / 9) 9 = 50 m.
62.	2	Let length of the bridge = x $\therefore \frac{(x+130)18}{45\times 5} = 30 \Rightarrow x+130 = 375 \Rightarrow x = 245m.$
63.	2	Distance traveled by 1st train in 1 hr = 20 km. $\therefore$ Remaining distance = 110 – 20 = 90 km. Trains are in opposite directions. $\therefore$ Relative speed = 20 + 25 = 45 km/hr. Time taken to meet = 90/45 = 2 hrs. $\therefore$ they will meet at 10 *A*.M.
64.	1	Let the speed of man in still water = x km/hr. and speed of current = y km/hr. $\therefore$ speed of upstream = $x - y$ km/hr. and speed of downstream = $x + y$ km/hr. So $\frac{30}{x-y} + \frac{44}{x+y} = 10$. Also $\frac{40}{x-y} + \frac{55}{x+y} = 13$. Solving the 2 equations, x = 8 km/hr. and y = 3 km/hr.
65.	2	Speed of train = 25 km/hr = 25 × 5 / 18 = 125 / 18 m/sec. Speed of man = 7 km/hr. = 7 × 5 / 18 = 35 / 18 m/sec. Direction is same. So relative speed = 125 / 18 – 35/18 = 5m / sec. Time taken to pass the man = 10 sec. $\therefore$ Length of train = 5 × 10 = 50 m. Also (50 + L) = 18 (125 / 18) $\Rightarrow$ 50 + L = 125 $\Rightarrow$ L = 75 m.
66.	3	Speed of train = 36 km / hr = 10m / sec. Speed of man = 9 km / hr. = 5 / 2m / sec. As directions are opposite. $\therefore$ relative speed = 10 + 5/2 = 25/2 m/sec. Time taken to pass the man = 6 sec. Hence length of train = 25 / 2 × 6 = 75m. Also (75 + L) = 12 × 10 $\Rightarrow$ 75 + L = 120 $\Rightarrow$ Length of platform = 45 m.
67.	1	Let x be the length of the train. Now, equating the speeds on both sides we get. $\frac{210+x}{25} = \frac{122+x}{17} \Rightarrow x = 65m.$ $\therefore$ speed of train = (210 + 65) / 25 = 11 m / sec.
68.	2	Speed of the train = (150 + 250) / 30 = 40 / 3m / sec. $\therefore$ required time taken = $\frac{(150+130).3}{40} = 21\text{sec}.$

69.	3	(Length of Train + Length of Bridge) = $(90 \times \frac{5}{18})(36) \Rightarrow L + B = 900$m. Length of second train = L – 100. $\therefore (L - 100 + B) = (45 \times \frac{5}{18})t$ $\Rightarrow 800 = \frac{25t}{2} \Rightarrow t = 64$ sec.
70.	1	Let the speeds of 2 trains be x m/sec and y m/sec. $\therefore x + y = 240/3 = 80$ and $x - y = 240/60 = 4$. Solving these 2 equations, we get $x = 42$ m/sec and $y = 38$ m/sec.
71.	1	Total length to be crossed by the bullock cart = 5 + 235 = 240 m. Speed of cart = 4.8 km / hr = 4 / 3 m / sec. $\therefore$ time taken to cross the bridge = (240 × 3) / 4 = 180 sec.
72.	1	Interval of trains = 14 min. Speed of train = 36 km/hr. Interval of man = 18 min. Let speed of man = m km/hr. Equating the distance traveled by train and man on both sides, we get 14 × 60 × 36 × 5/18 $= (36 \times \frac{5}{18} - m) \times 18 \times 60.$ $\Rightarrow$ m = 8 km/hr.
73.	3	Speed of 1st man = 9 km / hr. Speed of 2nd man = 6 km / hr. Let length of train be L and speed of train be x km / hr. $\therefore (x - 9)\frac{40}{60} = (x - 6)\frac{30}{60}$ $\Rightarrow 4x - 36 = 3x - 18$ $\Rightarrow x = 18$ km/hr.
74.	3	Time taken to meet each other is 8 ½ hours. The relative speed is (85 + 67) i.e. 152 km/hr. Thus the distance between the stations is the distance traveled in 8 ½ hours at 152 km/hr. = 8 ½ × 152 = 17/2 × 152 = 17 × 76 = 1292 km.
75.	4	Speed of boat in still water = x = 10 km/hr. Let rate of flow of river = y km/hr. $\therefore$ speed of u/s = 10 – y and speed of d / s = 10 + y $\therefore \frac{91}{10+y} + \frac{91}{10-y} = 20 \Rightarrow y = 3$ km/hr.
76.	2	Let x be the speed of man in still water and y be the speed of current. Speed of d / s = (1.5 / 15) × 60 = 6 km / hr. Speed of u / s = (1.5 / 22.5) × 60 = 4 km / hr. $\therefore$ rate of current = (6 – 4) / 2 = 1km/hr.
77.	1	Speed of upstream = 36 / 6 = 6 km / hr. Speed of man in still water = 8 km / hr. $\therefore$ Speed of current = 8 – 6 = 2 km / hr. So speed of downstream = 8 + 2 = 10 km / hr. $\therefore$ distance traveled in 10 hrs = 10 × 10 = 100 km.
78.	1	Speed of upstream = 4 – 2 = 2 km / hr. Speed of downstream = 4 + 2 = 6 km / hr. Distance covered upstream in 9 hours = 2 × 9 = 18 km. $\therefore$ Time taken to cover 18 km downstream = 18 / 6 = 3 hrs.

79.	3	Speed of upstream = 6 – 2 = 4 km / hr. Speed of downstream = 6 + 2 = 8 km / hr. Let D be the required distance. $\therefore D / 4 - D / 8 = 3 \Rightarrow D = 24$ km.
80.	2	Let x be the speed of man in still water and y be the speed of stream. Now $\frac{4}{x+y} = \frac{3}{x-y} \Rightarrow x = 7y$. Also $\frac{48}{x-y} + \frac{48}{x+y} = 14.$ $\Rightarrow y = 1$ km/hr.
81.	4	X covers 1000 meters, Y covers 950 m. Also, when X covers 1000 meters, Z covers 931 m. $\therefore$ when Y covers 1000 m, Z covers $\frac{931}{950} \times 1000$ = 980 m $\Rightarrow$ Y gives Z a start of 1000 – 980 = 20 m.
82.	3	Both races are of 400 m. Let x be the speed of A and y be the speed of B. $\therefore \frac{385}{y} - \frac{400}{x} = 5$ and $\frac{400}{y} - \frac{400}{x} = \frac{50}{7}$. Solving these 2 equations, we get x = 8 m / sec and y = 7 m / sec.
83.	2	Let V_A and V_B be the speeds of A and B and t_A and t_B be the time taken by A and B. $\therefore \frac{1000}{V_A} = \frac{875}{V_B} \Rightarrow \frac{V_A}{V_B} = \frac{8}{7} \Rightarrow t_A : t_B = 7 : 8.$ Also $t_B - t_A = 30$ sec. $\therefore t_B = 4$ min. and $t_A = 3.5$ min.
84.	3	A beats B by 60 seconds and B beats C by 30 secs. $\therefore$ A beats C by (60 + 30) or 90 seconds. But A beats C by 375 m. $\therefore C$ runs 375 m in 90 seconds. $\therefore C$ runs 1000 m in $\frac{90}{375} \times 1000 = 240$ seconds = 4 minutes.
85.	4	A beats B by 100/3 metres. Total time taken by A and B to complete the race. So B covers 100 /3 m in 10 sec. $\therefore$ Speed of B = 10/3 m/sec. Hence length of course = 10/3 × 300 = 1000 m.
86.	2	Let the distance between his house and office = x. Time difference = 5– (–10) = 15 min. $\therefore x / 30 - x / 40 = 15 / 60 \Rightarrow x = 30$ km.
87.	3	Let the usual time be x min. Speed is increased by 4 / 3. $\therefore$ timing is reduced by ¾. $\therefore x - ¾ x = 10 \Rightarrow x = 40$ min.

88.	1	$21 - x$ x P R Q Let the distance between RQ = x. $\therefore$ Distance between PR = $21 - x$. Speed of A = 3km / hr. Speed of B = 4km / hr. $\therefore (21 - x) / 3 = (21 + x) / 4$ $\Rightarrow x = 3$. Hence distance between P to R = 21 – 3 = 18 km.
89.	4	After passing each other, they complete their journeys in $3\frac{1}{3}$ i.e. 10 / 3 and $4\frac{4}{5}$ i.e. 24 / 5 hrs. Speed of first man = 8km / hr. Let the speed of the 2nd man = y. Applying the relation $x : y = \sqrt{t_B} : \sqrt{t_A}$, we get $8 : y = \sqrt{\frac{24}{5}} : \sqrt{\frac{10}{3}}$ $\Rightarrow 64 : y^2 = 24 / 5 : 10 / 3$ $\Rightarrow y = 6\ 2 / 3$ km/hr.
90.	2	Distance traveled by train in 12 min. 30 sec. = Distance traveled by sound in 30 sec. Now distance traveled by sound in 30 sec. = 330 × 30 m. $\therefore$ speed of train = (330 × 30) / (750) = 66 / 5 m/sec. $\Rightarrow$1188 / 25 km/hr $\Rightarrow$ 47 13 / 25 km / hr.
91.	3	Speed of man = 3 km / hr. Carriage visible for 4 minutes and up to a distance of 100 m. $\therefore$ Distance covered by man in 4 min. $= 3 \times \frac{5}{18} \times 4 \times 60 = 200$m. $\therefore$ Total distance to be covered = 200 + 100 = 300 m. $\therefore$ speed of the carriage = 300 / 4 × 60 = 5 / 4 m / sec. = 5 / 4 × 18 / 5 = 4.5 km / hr.
92.	4	Total length of the pole = 14 m. Distance covered in 2 minutes = (2 – 1) = 1 metre. $\therefore$ Distance covered in 2 × 12 i.e. 24 min = 12 metres $\therefore$ it will take 1 more minute to cover the last 2 meters. Hence total time taken to reach the top = 24 + 1 = 25 min.
93.	1	Let the distance traveled = x. Difference of time = 16 min. $\therefore$ $x / 15 - x / 16 = 16 / 60 \Rightarrow x = 64$ km.
94.	3	Time difference = 5 hrs. Let the length of the journey = x. $\therefore x / 45 - x / 60 = 5$ $\Rightarrow x = 900$ km.
95.	3	$W + R = 8$. $R + R = 6$. $\Rightarrow R = 3$. $\therefore W = 5$. So $W + W = 5 + 5 = 10$.

96.	2	Total distance to be covered = 80 km. Total time = 10 hrs. Half journey i.e. 40 km. is covered in 3 / 5 × 10 i.e. 6 hrs. ∴ Remaining distance i.e. 40 km. is to be covered in 4 hrs. Hence required speed = 40 / 4 = 10 km / hr.
97.	1	Circumference of path = πd = 22 / 7 × 161 = 506 yards. 3 mph = $\frac{22}{15}$ yards / sec. 5 mph = $\frac{22}{9}$ yards / sec. 6 mph = $\frac{44}{15}$ yards / sec. Time taken by *A*, *B* and *C* to complete the path = $\frac{506\times15}{22} = 345$ sec, $\frac{506\times9}{22} = 207$ sec and $\frac{506\times15}{44} = 172.5$ sec. So they will be meeting again after LCM of 345, 207 & 172.5 i.e. after 1035 sec.
98.	3	Distance covered by the wheel in 7 revolutions = 30 / 7 × 7 = 30 m. ∴ speed of train = 30 / 4 × 18 / 5 = 27 km / hr.
99.	3	Speed of writing of the 1st boy = 200 lines / hr. Speed of writing of the 2nd boy = 150 lines / hr. They are in opposite directions. ∴ Relative speed = 200 + 150 = 350 lines / hr. ∴ time taken to meet = 8190 / 350 = 23.4 hrs. They will meet at 200(23.4) = 4680th line.
100.	2	Let the thief ran for *x* km before he is overtaken. Distance to be covered initially = 200 m. = 0.2 km. ∴ *x* / 10 = (0.2 + *x*) /12 ⇒ *x* =1 km.