22 CHAPTER

TIME, DISTANCE & TRAIN

EXERCISE

1. A train is travelling at the rate of 45km/hr. How many seconds it will take to cover a distance of $\frac{4}{5}$ km?
   (a) 36 sec. (b) 64 sec.
   (c) 90 sec. (d) 120 sec.
2. An aeroplane covers a certain distance at a speed of 240 km/ hour in 5 hours. To cover the same distance in $1\frac{2}{3}$ hours it must travel at a speed of:
   (a) 300 km./hr. (b)360 km./hr.
   (c) 600 km./hr. (d)720km. /hr.
3. A train 100 m long is running at the speed of 30 km/hr. The time (in second) in which it passes a man standing near the railway line is:
   (a) 10 (b) 11
   (c) 12 (d) 15
4. If a man walks 20 km at 5 km/ hr, he will be late by 40 minutes. If he walks at 8 km/ hr, how early from the fixed time will he reach?
   (a) 15 minutes (b) 25 minutes
   (c) 50 minutes (d) $1\frac{1}{2}$ hours
5. A man walking at the rate of 5 km/hr crosses a bridge in 15 minutes. The length of the bridge (in metres) is:
   (a) 600 (b) 750
   (c) 1000 (d) 1250
6. A man crosses a road 250 metre wide in 75 seconds. His speed in km/hr is:
   (a) 10 (b) 12
   (c) 12.5 (d) 15
7. The length of a train and that of a platform are equal. If with a speed of 90 km/hr the train crosses the platform in one minute, then the length of the train(in meteres) is:
   (a) 500 (b) 600
   (c) 750 (d) 900
8. A train passes a 50 metre long platform in 14 seconds and a man standing on the platform in 10 seconds. The speed of the train is:
   (a) 24 km/hr. (b) 36 km/hr.
   (c) 40 km/hr. (d) 45 km/hr.
9. A car goes 10 metres in a second. Find its speed in km/ hour.
   (a) 40 (b) 32
   (c) 48 (d) 36
10. A train passes two bridges of lengths 800 m and 400 m in 100 seconds and 60 seconds respectively. The length of the train is:
    (a) 80 m (b) 90 m
    (c) 200 m (d) 150 m
11. A train is 125 m long. If the train takes 30 seconds to cross a tree by the railway line, then the speed of the train is :
    (a) 14 km/hr. (b) 15 km/hr.
    (c) 16 km/hr. (d) 12 km/hr.
12. A 75 metre long train is moving at 20 kmph. It will cross a man standing on the platfrom in
    (a) 12 sec. (b) 14 sec.
    (c) 13.5 sec. (d) 15.5 sec.
13. A man can reach a certain place in 30 hours. If he reduces his speed by $\frac{1}{15}$ th, he comes 10 km less in that time. Find his speed in km per hour.
    (a) 6 km/hr. (b) $5\frac{1}{2}$ km/hr.
    (c) 4 km/hr. (d) 5 km/hr.
14. A train is moving with the speed of 180 km/hr. Its speed (in metres per second) is :
    (a) 5 (b) 40
    (c) 30 (d) 50
15. A train takes 18 seconds to pass through a platform 162 m long and 15 seconds to pass another platform 120 m long. The length of the train(in m) is :
    (a) 70 (b) 80
    (c) 90 (d) 105
16. A 120 metre long train is running at a speed of 90 km per hour. It will cross a railway platform 230 m long in :
    (a) $4\frac{4}{5}$ seconds (b) $9\frac{1}{5}$ seconds
    (c) 7 seconds (d) 14 seconds
17. If a train with a speed of 60km/ hr, crosses a pole in 30 seconds. The length of the train (in metres) is:
    (a) 1000 (b) 900
    (c) 750 (d) 500
18. Two cars start at the same time from one point and move along two roads, at right angle to each other. Their speeds are 36 km/ hr and 48 km/hr respectively. After 15 seconds distance between them will be
    (a) 400 m (b) 150 m
    (c) 300 m (d) 250 m
19. A train travelling at a speed of 30 m/sec crosses a platform, 600 metres long in 30 seconds. The length (in metres) of train is
    (a) 120 (b) 150
    (c) 200 (d) 300

20. The ratio of lengths of two trains is 5 : 3 and the ratio of their speeds is 6 : 5. The ratio of time taken by them to cross a pole is
(a) 5 : 6 (b) 11 : 8
(c) 25 : 18 (d) 27 : 16

21. A train 300 metre long is running at a speed of 25 metre per second. It will cross a bridge of 200 metre long in
(a) 5 seconds (b) 10 seconds
(c) 20 seconds (d) 25 seconds

22. A train 800 metre long is running at the speed of 78 km/hr. if it crosses a tunnel in 1 minute, then the length of the tunnel (in metres) is :
(a) 200 (b) 500
(c) 300 (d) 400

23. A train is moving at a speed of 132km/hour. If the length of the train is 110 metres, how long will it take to cross a railway platform 165 metres long?
(a) 5 second (b) 7.5 seconds
(c) 10 seconds (d) 15 seconds

24. A truck covers a distance of 550 metre in 1 minute whereas a bus covers a distance of 33 kms in 45 minutes. The ratio of their speed is:
(a) 4 : 3 (b) 3 : 5
(c) 3 : 4 (d) 50 : 3

25. A train passes a telegraph post and a bridge 264 m long in 8 seconds and 20 seconds respectively. What is the speed of the train?
(a) 69.5 km/hr. (b) 70 km/hr.
(c) 79 km/hr. (d) 79.2 km/hr.

26. A boy runs 20 km in 2.5 hours. How long will he take to run 32 km at double the previous speed?
(a) 2 hours (b) $2\frac{1}{2}$ hours
(c) $4\frac{1}{2}$ hours (d) 5 hours

27. A moving train crosses a man standing on a platform and the platform 300 metres long in 10 seconds and 25 seconds respectively. What will be the time taken by the train to cross a platform 200 metre long ?
(a) $16\frac{2}{3}$ sec. (b) 18 sec.
(c) 20 sec. (d) 22 sec.

28. A train, with a uniform speed, crosses a platform, 162 metre long, in 18 seconds and another platform, 120 metre long, in 15 seconds. The speed of the train is
(a) 14 km/hr (b) 42 km/hr
(c) 50.4 km/hr (d) 67.2 km/hr

29. A train, 110 m long is running at a speed of 60 km/hr. How many seconds does it take to cross another train, 170 m long standing on parallel track ?
(a) 15.6 sec (b) 16.8 sec
(c) 17.2 sec (d) 18 sec

30. A train is running at 36 km/hr.If it crosses a pole in 25 seconds, its length is
(a) 248 m (b) 250 m
(c) 255 m (d) 260 m

31. The speed of two trains are in the ratio 6 : 7. If the second train runs 364 km in 4 hours, then the speed of first train is
(a) 60 km/hr (b) 72 km/hr
(c) 78 km/hr (d) 84 km/hr

32. Walking at the rate of 4 km an hour, a man covers a certain distance in 3 hours 45 minutes. If he covers the same distance on cycle, cycling at the rate of 16.5 km/hour, the time taken by him is
(a) 55.45 minutes
(b) 54.55 minutes
(c) 55.44 minutes
(d) 45.55 minutes

33. A train crosses a pole in 15 seconds and a platform 100 metre long in 25 seconds. Its length (in metre) is
(a) 50 (b) 100
(c) 150 (d) 200

34. A train of length 500 feet crosses a platform of length 700 feet in 10 seconds. The speed of the train is
(a) 70 ft/ second
(b) 85 ft/second
(c) 100 ft/ second
(d) 120 ft/second

35. The speed of 90 km/hour is same as
(a) 9 m/s (b) 20 m/s
(c) 25 m/s (d) 28 m/s

36. The speed of a bus is 72 km/hr. The distance covered by the bus in 5 seconds is
(a) 100 m (b) 60 m
(c) 50 m (d) 74.5 m

37. A train starts from a place A at 6 a.m. and arrives another place B at 4:30 p.m. on the same day. If the speed of the train is 40 km per hour, find the distance travelled by the train?
(a) 320 km (b) 230 km
(c) 420 km (d) 400 km

38. A train covers a distance of 10 km in 12 minutes. If its speed is decreased by 5km/hr, the time taken by it to cover the same distance will be:
(a) 10 minutes
(b) 13 minutes 20 sec
(c) 13 minutes
(d) 11 minutes 20 sec

39. A man walks 'a' km in 'b' hours. The time taken by him to walk 200 metres is
(a) $\frac{200b}{a}$ hours (b) $\frac{b}{5a}$ hours
(c) $\frac{b}{a}$ hours (d) $\frac{ab}{200}$ hours

40. The speed $3\frac{1}{3}$ m/sec when expressed in km/hour becomes
(a) 8 (b) 9
(c) 10 (d) 12

41. Two trains, A and B, start from stations X and Y towards each other, they take 4 hours 48 minutes and 3 hours 20 minutes to reach Y and X respectively after they meet. If train A is moving at 45 km/hr. , then the speed of the train B is
(a) 60 km/hr (b) 64.8 km/hr
(c) 54 km/hr (d) 37.5 km /hr

42. A bullock cart has to cover a distance of 120 km in 15 hours. If it covers half of the journey in $\frac{3}{5}$ th time, the speed to cover the remaining distance in the time left has to be
(a) 6.4 km/hr (b) 6.67 km/hr
(c) 10 km/hr (d) 15 km/hr

43. A train covers a certain distance in 210 minutes at a speed of 60 kmph. The time taken by the train, to cover the same distance at a speed of 80 kmph is:

(a) $3\frac{5}{8}$ hours (b) $2\frac{5}{8}$ hours

(c) $4\frac{5}{8}$ hours (d) 3 hours

44. A man covers $\frac{9}{20}$ distance by bus and the remaining 10 km on foot. His total journey (in km) is

(a) 15.6 (b) 24

(c) 18.18 (d) 12.8

45. A train 200 m long running at 36 kmph takes 55 seconds to cross a bridge. Length of the bridge is

(a) 375 m. (b) 300 m.

(c) 350 m. (d) 325 m.

46. A train 270 metres long is running at a speed of 36 km per hour then it will cross a bridge of length 180 metres in :

(a) 40 sec (b) 45 sec

(c) 50 sec (d) 35 sec

47. A distance is covered by a cyclist at a certain speed. If a jogger covers half the distance in double the time, the ratio of the speed of the jogger to that of the cyclist is

(a) 1 : 4 (b) 4 : 1

(c) 1 : 2 (d) 2 : 1

48. A train is moving at a speed of 80 km/h and covers a certain distance in 4.5 hours. The speed of the train to cover the same distance in 4 hours is

(a) 100 km/h (b) 70 km/h

(c) 85 km/h (d) 90 km/h

49. A train passes by a lamp post at platfrom in 7 sec. and passes by the platfrom completely in 28 sec. If the length of the platfrom is 390 m, then length of the train (in metres) is

(a) 120 (b)130

(c) 140 (d)150

50. A train moving at a rate of 36 km/hr crosses a standing man in 10 seconds. It will cross a platfrom 55 metres long in :

(a) 6 seconds (b) 7 seconds

(c) $15\frac{1}{2}$ seconds (d) $5\frac{1}{2}$ seconds

51. A train crosses a platform in 30 seconds travelling with a speed of 60 km/h. If the length of the train be 200 metres, then the length (in metres) of the platform is

(a) 400 (b) 300

(c) 200 (d) 500

52. Ram travelled 1200 km by air which is formed $\frac{2}{5}$ of his trip. He travelled one-third of the trip by car and the rest by train. The distance (in km) travelled by train was

(a) 480 (b) 800

(c) 1600 (d) 1800

53. The distance between place A and B is 999 km. An express train leaves place A at 6 am and runs at a speed of 55.5 km/hr. The train stops on the way for 1 hour 20 minutes. It reaches B at

(a) 1:20 am (b) 12 pm

(c) 6 pm (d) 11 pm

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

(a) 60 minutes (b) 50 minutes

(c) 55 minutes (d) 70 minutes

55. A is twice as fast as B and B is thrice as fast as C. The journey covered by C in $1\frac{1}{2}$ hours will be covered by A in

(a) 15 minutes (b) 2 minutes

(c) 30 minutes (d) 1 hour

56. A truck travels at 90 km/hr for the first $1\frac{1}{2}$ hours. After that it travels at 70 km/hr. Find the time taken by the truck to travel 310 kilometres.

(a) 2.5 hrs (b) 3 hrs

(c) 3.5 hrs (d) 4 hrs

57. A car travels at a speed of 60 km/hr and covers a particular distance in one hour. How long will it take for another car to cover the same distance at 40 km/hr?

(a) $\frac{5}{2}$ hours (b) 2 hours

(c) $\frac{3}{2}$ hours (d) 1 hours

58. A train 50 metre long passes a platform of length 100 metres in 10 seconds. The speed of the train in metre/second is

(a) 50 (b) 10 (c) 15 (d) 20

59. A train 300 m long is running with a speed of 54 km/hr. In what time will it cross a telephone pole?

(a) 20 seconds (b) 15 seconds

(c) 17 seconds (d) 18 seconds

60. A train travelling at a speed of 55 km/hr travels from place X to place Y in 4 hours. If its speed is increased by 5 km/hr, then the time of journey is reduced by

(a) 25 minutes (b) 35 minutes

(c) 20 minutes (d) 30 minutes

61. If a distance of 50 m is covered in 1 minute, 90 m in 2 minutes and 130 m in 3 minutes. Find the distance covered in 15^{th} minute.

(a) 610 m (b) 750 m

(c) 1000 m (d) 650 m

62. If a person travels from a point L towards east for 12 km and then travels 5 km towards north and reaches a point M, then the shortest distance from L to M is:

(a) 12 km (b) 14 km

(c) 17 km (d) 13 km

(CGL 16-08-2015 Morning)

63. 2 km 5 m is equal to?

(a) 2.5 km (b) 2.005 km

(c) 2.0005 km (d) 2.05 km

64. The diameter of each wheel of car is 70 cm, If each wheel rotates 400 times per minute, then the speed of the car (in km/hr) if $\left(\text{Take } \pi=\frac{22}{7}\right)$

(a) 5.28 (b) 528

(c) 52.8 (d) 0.528

65. A car goes 20 meters in a second. Find its speed in Km/hr.

(a) 20 (b) 18 (c) 72 (d) 36

(LDC 15-11-2015 Morning)

66. A train passes two bridges of length 500 m and 250 m in 100 seconds and 60 seconds respectively. The length of the train is:

(a) 125m (b) 250m

(c) 120m (d) 152m

(LDC 15-11-2015 Morning)

67. A train is 250m long. If the train takes 50 seconds to cross a tree by the railway line, then the speed of the train in km/hr is:
(a) 9 (b) 5
(c) 18 (d) 10

(LDC 06-12-2015 Morning)

68. Each wheel of a car is making 5 revolutions per second. If the diameter of a wheel is 84 cm, then the speed of the car in cm/sec would be.
(a) 420 cm./sec. (b) 264 cm./sec.
(c) 1000 cm./sec. (d) 1320 cm./sec.

69. A man rides at the rate of 18 km/hr, but stops for 6 mins. to changes horses at the end of every 7 km. The time that he will take to cover a distance of 90 km is
(a) 6 hrs
(b) 6 hrs. 12 min.
(c) 6 hrs. 18 min.
(d) 6 hrs, 24 min.

70. The distance between 2 places R and S is 42 km. Anita starts from R with a uniform speed of 4 km/h towards S and at the same time Romita starts from S towards R also with some uniform speed. They meet each other after 6 hours. The speed of Romita is
(a) 18 km/hour (b) 20 km/hour
(c) 3 km/hour (d) 8 km/hour

TYPE B

71. A train 180 m long moving at the speed of 20 m/sec overtakes a man moving at a speed of 10m/sec in the same direction. The train passes the man in:
(a) 6 sec (b) 9 sec
(c) 18 sec (d) 27 sec

72. The distance between two cities A and B is 330 km. A train starts from A at 8 a.m. and travels towards B at 60 km/hr. Another train starts from B at 9 a.m. and travels towards A at 75 km/hr. At what time do they meet?
(a) 10:00 am (b) 10:30 am
(c) 11:00 am (d) 11:30 am

73. Two men are standing on opposite ends of a bridge 1200 metre long. If they walk towards each other at the rate of 5m/minute respectively, in how much time will they meet each other?
(a) 60 minutes (b) 120 minutes
(c) 85 minutets (d) 90 minutes

74. How many seconds will a 500 metre long train take to cross a man walking with a speed of 3 km./hr. in the direction of the moving train if the speed of the train is 63 km/hr ?
(a) 25 sec (b) 30 sec
(c) 40 sec (d) 45 sec

75. A thief is noticed by a policeman from a distance of 200 m. the thief starts running and the policeman chases him. The thief and the policeman run at the rate of 10 km/hr and 11 km/hr resp-ectively. What is the distance between them after 6 minutes?
(a) 100 m (b) 190 m
(c) 200 m (d) 150 m

76. Two trains, one 160 m and the other 140 m long are running in opposite directions on parallel tracks, the first at 77 km an hour and the other at 67 km an hour. How long will they take to cross each other?
(a) 7 seconds (b) $7\frac{1}{2}$ seconds
(c) 6 seconds (d) 10 seconds

77. Two trains are running in opposite direction with the same speed. If the length of each train is 120 metres and they cross each other in 12 seconds. The speed of each train (in km/hour) is
(a) 72 (b) 10
(c) 36 (d) 18

78. A constable is 114 metre behind a thief. The constable runs 21 metres per minute and the thief runs 15 metres in a minute. In what time will the constable catch the thief?
(a) 19 minutes (b) 18 minutes
(c) 17 minutes (d) 16 minutes

79. A, B and C start at the same time in the same direction to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds, all starting from the same point. After what time will they again meet at the starting point again?
(a) 46 min 12 sec
(b) 45 miuntes
(c) 42 min 36 sec
(d) 26 min 18 sec

80. Two trains of equal length take 10 seconds and 15 seconds respectively to cross a telegraph post. If the length of each train be 120 metres, in what time (in seconds) will they cross each other travelling in oppostie direction?
(a) 16 (b) 15 (c) 12 (d) 10

81. How much time does a train 50 m long, moving at 68 km/hr takes to pass another train 75 m long moving at 50 km/hr in the same direction?
(a) 5 seconds (b) 10 seconds
(c) 20 seconds (d) 25 seconds

82. A constable follows a thief who is 200 m ahead of the constable. If the constable and the thief run at speed of 8 km/hr and 7 km/hr respectively, the constable would catch the thief in
(a) 10 minutes (b) 12 minutes
(c) 15 minutes (d) 20 minutes

83. Two trains are running with speed 30 km/hr and 58 km/hr in the same direction, a man in the slower train passes the faster train in 18 seconds. The length (in metres) of the faster train is :
(a) 70 (b) 100
(c) 128 (d) 140

84. A walks at a uniform rate of 4 km an hour; and 4 hours after his start, B bicycles after him at the uniform rate of 10 km an hour. How far from the starting point will B catch A ?
(a) 16.7 km (b) 18.6 km
(c) 21.5 km (d) 26.7 km

85. A train passes two persons walking in the same direction at a speed of 3 km/hr and 5km/hr respectively in 10 seconds and 11 seconds respectively. The speed of the train is
(a) 28 km/hour (b) 27km/hour
(c) 25 km/hour (d) 24km/hour

86. Two trains start at the same time for two station A and B toward B and A respectively. If the distance between A and B is 220 km and their speeds are 50km/hr and 60 km/hr respectively then after how much time will they meet each other

(a) 2 hr (b) $2\frac{1}{2}$ hr

(c) 3 hr (d) 1 hr

87. A man standing on a platform finds that a train takes 3 seconds to pass him and another train of the same length moving in the opposite direction, takes 4 seconds. The time taken by the trains to pass each other will be

(a) $2\frac{2}{7}$ seconds (b) $3\frac{3}{7}$ seconds

(c) $4\frac{3}{7}$ seconds (d) $5\frac{3}{7}$ seconds

88. A train, 150m long, passes a pole in 15 seconds and another train of the same length travelling in the opposite direction in 12 seconds. The speed of the second train is

(a) 45 km/hr (b) 48 km/hr

(c) 52 km/hr (d) 54 km/hr

89. A train travelling at 48 km/hr crosses another train, having half its length and travelling in opposite direction at 42 km/hr, in 12 seconds. It also passes a railway platform in 45 seconds. The length of the railway platform is

(a) 200 m (b) 300 m

(c) 350 m (d) 400 m

90. A bus moving at a speed of 45 km/hr catches a truck 150 metres ahead going in the same direction in 30 seconds. The speed of the truck is

(a) 27 km/hr (b) 24 km/hr

(c) 25 km/hr (d) 28 km/hr

91. A passenger train 150 m long is travelling with a speed of 36 km/hr. If a man is cycling in the direction of train at 9 km/hr., the time taken by the train to pass the man is

(a) 10 sec (b) 15 sec

(c) 18 sec (d) 20 sec

92. A constant distance from Chennai to Bangalore is covered by a person who also returns to the same distance at 80 km/hr. then the average speed during the whole journey is

(a) 90.20 km/hr

(b) 88.78 km/hr

(c) 80 km/hr

(d) 88.89 km/hr

93. A jeep is chasing a car which is 5 km ahead. Their respective speeds are 90 km/hr and 75 km/hr. After how many minutes will the jeep catch the car?

(a) 18 min. (b) 20 min.

(c) 24 min. (d) 25 min.

94. Buses start from a bus terminal with a speed of 20 km/hr at intervals of 10 minutes. What is the speed of a man coming from the opposite direction towards the bus terminal if he meets the buses at intervals of 8 minutes?

(a) 3 km/hr (b) 4 km/hr

(c) 5 km/hr (d) 7 km/hr

95. A train 300m long passed a man walking along the line in the same direction at the rate of 3 km/hr in 33 seconds.The speed of the train is

(a) 30 km/h (b) 32 km/h

(c) $32\frac{8}{11}$ km/h (d) $35\frac{8}{11}$ km/h

96. A train 100 metre long meets a man going in opposite direction at 5 km/hr and passes him in $7\frac{1}{5}$ seconds. What is the speed of the train (in km/hr) ?

(a) 45 km/hr (b) 60 km/hr

(c) 55 km/hr (d) 50 km/hr

97. Two trains of equal length are running on parallel lines in the same direction at 46 km/h and 36 km/h. The faster train passes, the slower train in 36 seconds. The length of each train is:

(a) 82 m (b) 50 m

(c) 80 m (d) 72 m

98. Two trains start from a certain place on two parallel tracks in the same direction. The speed of the trains are 45 km/hr and 40 km/hr respectively. The distance between the two trains after 45 minutes will be

(a) 2 km 500 m (b) 2 km 750 m

(c) 3 km 750 m (d) 3 km 250 m

99. Points 'A' and 'B' are 70 km apart on a highway and two cars start at the same time. If they travel in the same direction, they meet in 7 hours, but if they travel towards each other they meet in one hour. Find the speed of the two cars (in km/hr).

(a) 20, 30 (b) 40, 30

(c) 30, 50 (d) 20, 40

100. P and Q are 27 km away. Two trains with speed of 24 km/hr and 18 km/hr respectively start simultaneously from P and Q and travel in the same direction. They meet at a point R beyond Q . Distance QR is

(a) 126 km (b) 81 km

(c) 48 km (d) 36 km

101. Sarita and Julie start walking from the same place in the opposite directions. If Julie walks at a speed of $2\frac{1}{2}$ km/hr and Sarita at a speed of 2 km/hr, in how much time will they be 18 km apart?

(a) 4.0 hrs (b) 4.5 hrs

(c) 5.0 hrs (d) 4.8 hrs

102. Two trains 150 m and 120 m long respectively moving from opposite directions cross each other in 10 secs. If the speed of the second train is 43.2 km/hr, then the speed of the first train is

(a) 54 km/hr (b) 50 km/hr

(c) 52 km/hr (d)51 km/hr

103. Two trains, each of length 125 metre, are running on parallel tracks in opposite directions. One train is running at a speed 65 km/hour and they cross each other in 6 seconds. The speed of the other train is

(a) 75 km/hour (b) 85 km/ hour

(c) 95 km/hour (d) 105 km/hour

104. A boy started from his house on bicycle at 10 a.m. at a speed of 12 km per hour. His elder brother started after 1 hr 15 mins on scooter along the same path and caught him at 1:30 p.m. The speed of the scooter will be (in km/hr)

(a) 4.5 (b) 36 (c) $18\frac{2}{3}$ (d) 9

105. Two trains are running 40 km/hr and 20 km/hr respectively in the same direction. The fast train completely passes a man sitting in the slower train in 5 seconds. the length of the faster train is

(a) $23\frac{2}{9}$ m (b) 27 m

(c) $27\frac{7}{9}$ m (d) 23 m

106. Two trains 180 metres and 120 metres in length are running towards each other on parallel tracks, one at the rate 65 km/hour and another at 55 km/hour. In how many seconds will they be cross each other from the moment they meet ?

(a) 6 (b) 9 (c) 12 (d) 15

107. A thief steals a car at 1.30 p.m. and drive it off at 40 km/hr. The theft is discovered at 2 P.M. and the owner sets off in another car at 50 km/hr. he will catch the thief at

(a) 5 p.m. (b) 4 p.m.

(c) 4.30 p.m. (d) 6 p.m.

108. Two trains 100 metre and 95 metre long respectively pass each other in 27 seconds when they run in the same direction and in 9 seconds when they run in opposite directions. Speed of the two trains are

(a) 44 km/hr,22 km/hr

(b) 52 km/hr,26 km/hr

(c) 36 km/hr,18 km/hr

(d) 40 km/hr,20 km/hr

109. Motor-cyclist P started his journey at a speed of 30 km/hr. After 30 minutes, motor- cyclist Q started from the same place but with a speed of 40 km/hr. How much time (in hours) will Q take to overtake P?

(a) 1 (b) $\frac{3}{2}$

(c) $\frac{3}{8}$ (d) 2

110. A train running at the speed of 84 km/hr passes a man walking in opposite direction at the speed of 6 km/hr in 4 seconds. What is the length of train (in metre)?

(a) 150 (b) 120

(c) 100 (d) 90

111. A and B are 20 km apart, A can walk at an average speed of 4 km/hr and B at 6 km/hr. If they start walking towards each other at 7 a.m., when they will meet?

(a) 8.00 a.m. (b) 8.30 a.m.

(c) 9.00 a.m. (d) 10.00 a.m.

112. Raj and Prem walk in opposite direction at the rate of 3 km/hr and 2 km per hour respectively. How far will they be from each other after 2 hrs?

(a) 8 km (b) 10 km

(c) 2 km (d) 6 l km

113. A train 150 m long passes a km stone in 30 seconds and another train of the same length travelling in opposite direction in 10 seconds. The speed of the second train is:

(a) 90 km / hr (b) 125 km/ hr

(c) 75 km /hr (d) 25 km/ hr

TYPE C

114. A boy rides his bicycle 10 km at an average speed of 12 km/ hr and again travels 12 km at an average speed of 10 km/hr. His average speed for the entire trip is approximately:

(a) 10.4 km/hr (b) 10.8 km/hr

(c) 11.0 km/hr (d) 12.2 km/hr

115. A person travels 600 km by train at 80 km/hr 800 km by ship at 400 km/hr and 100 km by car at 50 km/hr. What is the average speed for the entire distance?

(a) $65\frac{5}{123}$ km./hr.

(b) $130\frac{10}{23}$ km./hr.

(c) $60\frac{5}{123}$ km./hr.

(d) 62 km./hr.

116. A train moves with a speed of 30 kmph for 12 minutes and for next 8 minutes at a speed of 45 kmph. Find the average speed of the train:

(a) 37.5 kmph (b) 36 kmph

(c) 48 kmph (d) 30 kmph

117. A car completes a journey in 10 hours. If it covers half of the journey at 40 kmph and the remaining half at 60 kmph , the distance covered by car is

(a) 400 km (b) 480 km

(c) 380 km (d) 300 km

118. A man goes from A to B at a uniform speed of 12 kmph and returns with a uniform speed of 4 kmph. His average speed (in kmph) for the whole journey is:

(a) 8 (b) 7.5

(c) 6 (d) 4.5

119. A train covers a distance of 3584 km in 2 days 8 hours. If it covers 1440 km on the first day and 1608 km on the second day, by how much does the average speed of the train for the remaining part of the journey differ from that for the entire journey?

(a) 3 km/h (b) 4 km/h

(c) 10 km/h (d) 2km/h

120. A man completed a certain journey by a car. If he covered 30% of the distance at the speed of 20km/hr, 60% of the distance at 40km/hr and the remaining distance at 10 km/hr; his average speed for the whole journey was

(a) 25 km/hr (b) 28 km/hr

(c) 30 km/hr (d) 33 km/hr

121. A person went from A to B at an average speed of x km/hr and returned from B to A at an average speed of y km/hr. What was his average speed during the total journey ?

(a) $\frac{x+y}{2xy}$ (b) $\frac{2xy}{x+y}$

(c) $\frac{2}{x+y}$ (d) $\frac{1}{x}+\frac{1}{y}$

122. A man goes from Mysore to Bangalore at a uniform speed of 40 km/hr and comes back to Mysore at a uniform speed of 60 Km/hr. His average speed for the whole journey is

(a) 48 km/hr (b) 50 km/hr

(c) 54 km/hr (d) 5 km/hr

123. One third of a certain journey is covered at the rate of 25 km / hour, one fourth at the rate of 30 km/hour and the rest at 50 km/hour. The average speed for the whole journey is

(a) 35 km/hour

(b) $33\frac{1}{3}$ km/ hour

(c) 30 km/hour

(d) $37\frac{1}{12}$ km/hour

124. P travels for 6 hours at the rate of 5 km/hour and for 3 hours at the rate of 6km/hour. The average speed of the journey in km/hour is

(a) $3\frac{1}{5}$ (b) $5\frac{1}{3}$

(c) $1\frac{2}{9}$ (d) $2\frac{2}{5}$

125. A bus covers three successive 3 km stretches at speed of 10 km/hr, 20 km/hr and 60 km/hr respectively. Its average speed over this distance is

(a) 30 km/hr (b) 25 km/hr

(c) 18 km/hr (d) 10 km/hr

126. A man travels for 5 hours 15 minutes. If he covers the first half of the journey at 60 km/h and rest at 45 km/h. Find the total distance travelled by him.

(a) 189 km (b) 378 km

(c) 270 km (d) $1028\frac{6}{7}$ km

TYPE D

127. In covering a certain distance, the speed of A and B are in the ratio of 3 : 4. A takes 30 minutes more than B to reach the destination. The time taken by A to reach the destination is:

(a) 1 hour (b) $1\frac{1}{2}$ hours

(c) 2 hours (d) $2\frac{1}{2}$ hours

128. A and B start at the same time with speed of 40 km/hr. and 50 km/hr. respectively. If in covering the journey A takes 15 miuntes longer than B, the total distance of the journey is:

(a) 40 km (b) 48 km

(c) 50 km (d) 52 km

129. A and B travel the same distance at speed of 9km/hr and 10 km/hr respectively. If A takes 36 minutes more than B, the distance travelled by each is

(a) 48 km (b) 54 km

(c) 60 km (d) 66 km

130. By walking at $\frac{3}{4}$ of his usual speed a man reaches his office 20 minutes later than his usual time. The usual time taken by him to reach his office is

(a) 75 minutes (b) 60 minutes

(c) 40 minutes (d) 30 minutes

131. Two men start together to walk a certain distance, one at 4 km/h and another at 3 km/h. The former arrives half an hour before the latter. Find the distance.

(a) 8 km (b) 7 km

(c) 6 km (d) 9 km

132. A and B started at the same time from the same place for a certain destination. B walking at $\frac{5}{6}$ of A's speed reached the destination 1 hour 15 minutes after A. B reached the destination in

(a) 6 hours 45 minutes

(b) 7 hours 15 minutes

(c) 7 hours 30 minutes

(d) 8 hours 15 minutes

133. If a man reduces his speed to 2/3, he takes 1 hour more in walking a certain distance. The time (in hours) to cover the distance with his normal speed is:

(a) 2 (b) 1 (c) 3 (d) 1.5

134. A train running at $\frac{7}{11}$ of its own speed reached a place in 22 hours. How much time could be saved if the train would run at its own speed?

(a) 14 hours (b) 7 hours

(c) 8 hours (d) 16 hours

135. A car travelling with $\frac{5}{7}$ of its usual speed covers 42 km in 1 hour 40 min 48 sec. what is the usual speed of the car ?

(a) $17\frac{6}{7}$ km/hr. (b) 35 km/hr.

(c) 25 km/hr. (d) 30 km/hr.

136. Two cars are moving with speed v_1, v_2 towards a crossing along two roads, If their distance from the crossing be 40 metres and 50 metres at an instant of time then they do not collide if their speeds are such that

(a) $v_1 : v_2 = 16 : 25$

(b) $v_1 : v_2 \neq 4 : 5$

(c) $v_1 : v_2 \neq 5 : 4$

(d) $v_1 : v_2 \neq 25 : 16$

137. A person started his journey in the morning. At 11 a. m. he covered $\frac{3}{8}$ of the journey and on the same day at 4.30 p.m. he covered $\frac{5}{6}$ of the journey. He started his journey at

(a) 6:00 a.m. (b) 3:30 a.m.

(c) 7:00 a.m. (d) 6:30 a.m.

138. A train starts from A at 7 a.m. towards B with speed 50 km/h. Another train starts from B at 8 a.m. with speed 60 km/h towards A. Both of them meet at 10 a.m. at C. The ratio of the distance AC to BC is

(a) 5 : 6 (b) 5 : 4 (c) 6 : 5 (d) 4 : 5

139. From two places, 60 km apart A and B start towards each other at the same time and meet each other after 6 hours. If A travelled with $\frac{2}{3}$ of his usual speed and B travelled with double of his speed they would have met after 5 hours. The speed of A is

(a) 4 km/hr. (b) 6 km/hr.

(c) 10 km/hr. (d) 12 km/hr.

140. In covering a distance of 30 km, Abhay takes 2 hours more than Sameer. If Abhay doubles his speed, then he would take 1 hour less than Sameer. Abhay's speed (in km/hr) is

(a) 5 (b) 6

(c) 6.25 (d) 7.5

141. A car driver leaves Bangalore at 8.30 a.m. and expected to reach a place 300 km away from Bangalore at 12:30 p.m. At 10:30 a.m. he finds that he has covered only 40% of the distance. By how much he has to increase the speed of the car in order to keep up his schedule?

(a) 45 km/hr (b) 40 km/hr

(c) 35 km/hr (d) 30 km/hr

142. A train leaves a station A at 7 am and reaches another station B at 11 am. Another train leaves B at 8 am and reaches A at 11.30 am. The two trains cross one another at

(a) 8 : 36 am (b) 8 : 56 am

(c) 9 : 00 am (d) 9 : 24 am

TYPE E

143. A man covered a certain distance at some speed. Had he moved 3 km per hour faster, he would have taken 40 minutes less. If he had moved 2 km per hour slower, he would have taken 40 minutes more. The distance (in km) is:
(a) 20 (b) 35
(c) $36\frac{2}{3}$ (d) 040

144. A man travelled a certain distance by train at the rate of 25 kmph. and walked back at the rate of 4 kmph. If the whole journey took 5 hours 48 minutes, the distance was
(a) 25 km (b) 30 km
(c) 20 km (d) 15 km

145. A student walks from his house at a speed of $2\frac{1}{2}$ km per hour and reaches his school 6 minutes late. The next day he increases his speed by 1 km per hour and reaches 6 minutes before school time. How far is the school from his house ?
(a) $\frac{5}{4}$ km (b) $\frac{7}{4}$ km
(c) $\frac{9}{4}$ km (d) $\frac{11}{4}$ km

146. A person, who can walk down a hill at the rate of $4\frac{1}{2}$ km/hour and up the hill at the rate of 3 km/hr. He ascends and comes down to his starting point in 5 hours. How far did he ascend ?
(a) 13.5 km (b) 3 km
(c) 15 km (d) 9 km

147. A car can cover a certain distance in $4\frac{1}{2}$ hours. If the speed is increased by 5km/ hour. it would take $\frac{1}{2}$ hour less to cover the same distance. Find the slower speed of the car.
(a) 50 km/hour (b)40 km/hour
(c) 45 km/hour (d)60 km/hour

148. A student goes to school at the rate of $2\frac{1}{2}$ km/h and reaches 6 minutes late. If he travels at the speed of 3 km/h, he is 10 minutes early. The distance (in km) between the school and his house is
(a) 5 (b) 4
(c) 3 (d) 1

149. With an average speed of 40 km/hr a train reaches its destination in time, If it goes with an average speed of 35 km/hr, it is late by 15 minutes. The total journey is
(a) 30 km (b) 40 km
(c) 70 km (d) 80 km

150. A car travels from P to Q at a constant speed. If its speed were increased by 10 km/h, it would have taken one hour lesser to cover the distance. It would have taken further 45 minutes lesser if the speed was further increased by 10 km/h. The distance between the two cities is
(a) 540 km (b) 420 km
(c) 600 km (d) 620 km

151. A man walks a certain distance in certain time, if he had gone 3 km per hour faster, he would have taken 1 hour less than the scheduled time, If he had gone 2 km per hour slower, he would have taken one hour longer on the road. The distance (in km) is:
(a) 60 (b) 45
(c) 65 (d) 80

152. A gun is fired from a fort. A man hears the sound 10 seconds later. If the sound travels at the rate of 330 m/sec, find the distance between the fort and the man.
(a) 330 km (b) 33 km
(c) 3.3 km (d) 0.33 km

TYPE F

153. Two trains start from station A and B and travel towards each other at speed of 50 km/hr and 60 km/hr respectively. At the time of their meeting, the second train has travelled 120 km more than the first. The distance between A and B is :
(a) 990 km (b) 1200 km
(c) 1320 km (d) 1440 km

154. A man walk a certain distance and rides back in 4 hours 30 minutes. he could ride both ways in 3 hours. The time required by the man to walk both ways is
(a) 4 hours 30 minutes
(b) 4 hours 45 minutes
(c) 5 hours
(d) 6 hours

MISSCELLENOUS

155. Two trains started at the same time, one from A to B and the other from B to A, If they arrived at B and A respectively 4 hours and 9 hours after they passed each other, the ratio of the speeds of the two trains was
(a) 2 : 1 (b) 3 : 2
(c) 4 : 3 (d) 5 : 4

156. Ravi and Ajay start simultaneously from a place A towards B, 60 km apart. Ravi's speed is 4 km /hr less than that of Ajay, after reaching B, Ajay turns back and meet Ravi at a place 12 km away from B, Ravi's speed is
(a) 12 km/hr (b) 10 km/hr
(c) 8 km/hr (d) 6 km/hr

157. Ravi travels 300 km partly by train and partly by car. He takes 4 hours to reach. If he travels 60 km. by train and rest by car. He will take 10 minutes more if he were to travel 100 km by train and rest by car .The speed of the train is:
(a) 50 km/hr (b) 60 km/hr
(c) 100 km/hr (d) 120 km/hr

RACE

158. A and B run a kilometre and A wins by 25 sec. A and C run a kilometre and A wins by 275m. When B and C run the same distance, B wins by 30 sec. The time taken by A to run a kilometre is
(a) 2 min 25 sec
(b) 2 min 50 sec
(c) 3 min 20 sec
(d) 3 min 30 sec

159. In a one-kilometre race A, B and C are the three participants. A can give B a start of 50 m. and C a start of 69 m. The start, which B can allow C is
(a) 17 m (b) 20 m
(c) 19 m (d) 18 m

160. In a kilometre race, A beats B by 30 seconds and B beats C by 15 seconds. If A beats C by 180 metres, the time taken by A to run 1 kilometre is
(a) 250 seconds
(b) 205 seconds
(c) 200 seconds
(d) 210 seconds

161. A and B run a 5 km race on a round course of 400 m. If their speed are in the ratio 5 : 4, the number of times, the winner passes the other is

(a) 1 (b) 2

(c) 3 (d) 5

162. In a race of 800 metres, A can beat B by 40 metres. In a race of 500 metres, B can beat C by 5 metres. In a race of 200 metres, A will beat C by

(a) 11.9 metre (b) 1.19 metre

(c) 12.7 metre (d) 1.27 metre

163. In a race of 200 metres, B can give a start of 10 metres to A and C can give a start of 20 metres to B. The start that C can give to A, in the same race, is

(a) 30 metres (b) 25 metres

(c) 29 metres (d) 27 metres

164. In a race of one kilometre. A gives B a start of 100 metres and still wins by 20 seconds. But if A gives B a start of 25 seconds, B wins by 50 meters. The time taken by A to run one kilometre is

(a) 17 sec. (b) $\frac{500}{29}$ sec.

(c) $\frac{1200}{29}$ sec. (d) $\frac{700}{29}$ sec.

165. A can give 40 metres start to B and 70 metres to C in a race of one kilometre how many metres start can B give to C in a race of one kilometre?

(a) 30 metre (b) $\frac{700}{29}$ metre

(c) $31\frac{1}{4}$ metre (d) 32 metre

166. In a 100 m race, Kamal defeats Bimal by 5 seconds. If the speed of Kamal is 18 kmph, then the speed of Bimal is

(a) 15.4 kmph (b) 14.5 kmph

(c) 14.4 kmph (d) 14 kmph

167. A, B, C walk 1 km in 5 minute 8 minutes and 10 minute respectively, C starts walking from a point, at a certain time, B starts from the same point 1 minutes later and A starts from the same point 2 minutes later then C. then A meets B and C after.

(a) $\frac{5}{3}$ min, 2 min

(b) 1 min, 2 min

(c) 2 min,3 min

(d) $\frac{4}{3}$ min, 3 min

168. A man travelled a distance of 72 km in 12 hours. He travelled partly on foot at 5 km/hour and partly on bicycle at 10 km/hour. The distance travelled on foot is

(a) 50 km (b) 48 km

(c) 52 km (d) 46 km

(SSC CPO 20-03-2016, Morning)

169. A train 150 meters long takes 20 seconds to cross a platform 450 meters long. The speed of the train in, km per hour is:

(a) 100 (b) 106

(c) 108 (d) 104

(SSC CPO 20-03-2016, Evening)

170. A car completed a journey of 400 km in $12\frac{1}{2}$ hrs. The first 3/4 of the journey was done at 30km/hr.Calculate the speed for the rest of the journey.

(a) 45 km/hr (b) 40 km/hr

(c) 25 km/hr (d) 30 km/hr

(SSC CPO 20-03-2016, Evening)

171. Points A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction,they meet in 5 hours. If the cars travel towards each other, they meet in 1 hour. What is the speed of the faster car?

(a) 70 km/hr. (b) 60 km/hr.

(c) 80 km/hr. (d) 40 km/hr.

(SSC CPO 20-03-2016, Morning)

172. Shalendra riding a bicycle at 20km/hr can reach his office in 3 hours. If he is late by 1 hour at the start, then in order to reach his destination in time he should ride at the speed of?

(a) 20 km/h (b) 25 km/h

(c) 30 km/h (d) 35 km/h

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

(a) 3 : 4 (b) 3 : 5

(c) 5 : 8 (d) 2 : 3

(SSC CPO(Re) 04-06-2016,Morning)

174. A man cycles at the speed of 8 km/hr and reaches office at 11 am and when he cycles at the speed of 12 km/hr, he reaches office at 9 am. At what speed should he cycle so that he reaches his office at 10 am?

(a) 9.6 km/hr

(b) 10 km/hr

(c) 11.2 km/hr

(d) cannot be determined

(SSC CPO(Re) 06-06-2016, Evening)

175. The diameter of a cycle wheel is 140 cm. The cyclist takes 30 hours to reach his destination at the speed of 22 kmph. How many revolutions will the cycle wheel make during his journey (assume π =22/7)

(a) 1 lakh (b) 2 lakh

(c) 3 lakh (d) $1^{1/2}$ lakh

(SSC CPO(Re) 07-06-2016, Evening)

176. Four people are running around a circular ground from a point on the circumference at 9 : 00 am. For one round, these four persons take respectively 40, 50, 60 and 30 minutes. At what time will they meet together again?

(a) 4 : 30 PM (b) 7 : 00 PM

(c) 6 : 00 PM (d) 5 : 30 PM

(SSC CPO(Re) 08-06-2016, Morning)

177. A man travels the distance of his journey $\frac{3}{4}$ by bus, $\frac{1}{6}$ by Rickshaw and remaining 2 km on foot. The total distance travelled by the man is

(a) 12 km (b) 18 km

(c) 20 km (d) 24 km

(SSC CGL Pre Exam 2016)

178. A man goes to a place on bicycle at speed of 16 km/hr and comes back at lower speed. If the average speed is 6.4 km/hr in total, then the return speed (in km/hr) is

(a) 10 (b) 8

(c) 6 (d) 4

(SSC CGL Pre Exam 2016)

179. A man covers a total distance of 100 km on bicycle. For the first 2 hours, the speed was 20 km/hr and for the rest of the journey, it came down to 10 km/hr. The average speed will be

(a) $12\frac{1}{2}$ km/hr (b) 13 km/hr

(c) 1/8 km/hr (d) 20 km/hr

(SSC CGL Pre Exam 2016)

180. The distance between two places A and B is 60 km. Two cars start at the same time from A and B, travelling at a speed of 35 km/h and 25 km/h respectively. If the cars run in the same direction, they will meet after (in hours)

(a) 6.5 (b) 6.3

(c) 6 (d) 6.52

(SSC CGL Pre Exam 2016)

181. A train, 200 m long, is running at a speed of 54 km/hr. The time in seconds that will be taken by train to cross a 175 m long bridge is

(a) 12.5 (b) 20

(c) 25 (d) 10

(SSC CGL Pre Exam 2016)

182. The time taken by a train 160 m long, running at 72 km/hr, to cross an electric pole is

(a) 8 sec (b) 9 sec.

(c) 6 sec (d) 4 sec.

(SSC CGL Pre Exam 2016)

183. A gun is fired at a distance of 1.7 km from Ram and he hears tha sound after 25 seconds. The speed of sound in meter per second is

(a) 60 (b) 62

(c) 64 (d) 68

(SSC CGL Pre Exam 2016)

184. A moving train passes a platform 50m long in 14 seconds and a lamp post in 10 seconds. The speed of the train (in km/h) is:

(a) 24 (b) 36

(c) 40 (d) 45

(SSC CGL Pre Exam 2016)

185. Gautam goes office at a speed of 12 kmph and returns home at 10 kmph. His average speed is

(a) 11 (b) 22

(c) 10.9 (d) 12.5

(SSC CGL Pre Exam 2016)

186. A man travels 50 km at speed 25 km/h and next 40 km at 20 km/h and there after travel 90km at 15 km/h. His average speed is

(a) 18 (b) 25

(c) 20 (d) 15

(SSC CGL Pre Exam 2016)

187. Two buses travel to a place at 45 km/hr and 60 km/hr respectively. If the second bus takes $5\frac{1}{2}$ hours less than the first for the journey, the length of the journey is:

(a) 900 km (b) 945 km

(c) 990 km (d) 1350 km

(SSC CGL Pre Exam 2016)

188. A car moving in the morning fog passes a man walking at 4km/h in the same direction. the man can see the car for 3 minutes and visiblity is upto a distance of 130 m. The speed of the car is :

(a) 10 km/hr (b) 6.6 km/hr

(c) 7 km/hr (d) 5km/hr

(SSC CGL Pre Exam 2016)

189. At an average of 80 km/hr Shatabdi Express reaches Ranchi from Kolkata in 7hrs. Then the distance between Kolkata and Ranchi is

(a) 560 km (b) 506 km

(c) 560 m (d) 650 m

(SSC CGL Pre Exam 2016)

190. To cover a certain distance with a speed of 60 km/hr, a train takes 15 hours. If covers the same distance in 12 hours, what will be its speed?

(a) 65 km/h (b) 70 km/h

(c) 75 km/h (d) 80 km/h

(SSC CGL Pre Exam 2016)

191. A car can finish a certain journey in 10 hours at a speed of 42 kmph. In order to cover the same distance in 7 hours, the speed of the car (km/h) must be increased by:

(a) 12 (b) 15

(c) 18 (d) 24

(SSC CGL Mains Exam 2016)

192. A man travels 450 km to his home partly by train and partly by car. He takes 8 hrs 40 min if he travels 240 km by train and rest by car. he takes 20 mins more if he travels 180 km by train and the rest by car. The speed of the car in km/hr is

(a) 45 (b) 50

(c) 60 (d) 48

(SSC CGL Mains Exam 2016)

193. A train 'B' speeding with 100 kmph crosses another train C, running in the same direction, in 2 mins. If the length of the train B and C be 150m and 250m respectively, what is the speed of the train C (in kmph)?

(a) 75 (b) 88

(c) 95 (d) 110

(SSC CGL Mains Exam 2016)

194. Two donkeys are standing 400 metres apart. First donkey can run at a speed of 3 m/sec and the second can run at 2 m/sec. If two donkeys run towards each other after how much time (in sec) will they bump into each other?

(a) 60 (b) 80

(c) 400 (d) 40

(SSC CGL Mains Exam 2016)

195. Rubi goes to a multiplex at the speed of 3 km/hr to see a movie and reaches 5 minutes late. If she travels at the speed of 4 km/hr she reaches 5 minutes early, Then the distance of the multiplex from her starting point is

(a) 2 km (b) 5 km

(c) 2 m. (d) 5 m.

(SSC CGL Mains Exam 2016)

196. A man travels some distance at a speed of 12 km/hr and returns at a speed of 9 km/hr. If the total time taken by him is 2 hr 20 min, the distance is

(a) 35 km (b) 21 km

(c) 9 km (d) 12 km

(SSC CGL Mains Exam 2016)

197. A and B are 15 km apart and when travelling towards each other meet after half an hour where as they meet two and a half hours later if they travel in the same direction. The faster of the two travels at the speed of

(a) 15 km (b) 18 km

(c) 10km (d) 8 km

(SSC CGL Mains Exam 2016)

198. A man can cover a certain distance in 3 hours 36 minutes if he walks at the rate of 5 km/hr. If he covers the same distance on cycle at the rate of 24 km/hr, then the time taken by him in minutes is

(a) 40 (b) 45

(c) 50 (d) 55

(SSC CGL Mains Exam 2016)

199. Due to inclement weather, an airplane reduced its speed by 300 km/hr and reached the destination of 1200 km late by 2hrs. Then the schedule duration of the flight was.

(a) 1 hour

(b) 1.5 hour

(c) 2 hour

(d) 2.5 hour

(SSC CGL Mains Exam 2016)

200. Three runners A, B and C run a race, with runner A finshing 12 meters ahead of runner B and 18 meters ahead of runner C, in another race of same type runner B finished 8 meters ahead of runner C. Each runner travels the entire distance at a constant speed. The length of the race is

(a) 36 metres (b) 48 metres

(c) 60 metres (d) 72 metres

(SSC CGL Mains Exam 2016)

201. A square playground measure 1127. 6164 sq.m. If a man walks $2\frac{9}{20}$ m a minute, the time taken by him to walk one round around it is approximately

(a) 50.82 min.

(b) 54.82 min.

(c) 54.62 min.

(d) 50.62 min.

(SSC CGL Mains Exam 2016)

ANSWER KEY

1.	(b)	24.	(c)	47.	(a)	70.	(c)	92.	(c)	114.	(b)	136.	(b)	158.	(a)	180.	(c)
2.	(d)	25.	(d)	48.	(d)	71.	(c)	93.	(b)	115.	(b)	137.	(d)	159.	(b)	181.	(c)
3.	(c)	26.	(a)	49.	(b)	72.	(c)	94.	(c)	116.	(b)	138.	(b)	160.	(b)	182.	(a)
4.	(c)	27.	(c)	50.	(c)	73.	(b)	95.	(d)	117.	(b)	139.	(b)	161.	(b)	183.	(d)
5.	(d)	28.	(c)	51.	(b)	74.	(b)	96.	(a)	118.	(c)	140.	(a)	162.	(a)	184.	(d)
6.	(b)	29.	(b)	52.	(b)	75.	(a)	97.	(b)	119.	(a)	141.	(d)	163.	(c)	185.	(c)
7.	(c)	30.	(b)	53.	(a)	76.	(b)	98.	(c)	120.	(a)	142.	(d)	164.	(b)	186.	(a)
8.	(d)	31.	(c)	54.	(b)	77.	(c)	99.	(b)	121.	(b)	143.	(d)	165.	(c)	187.	(c)
9.	(d)	32.	(b)	55.	(a)	78.	(a)	100.	(b)	122.	(a)	144.	(c)	166.	(c)	188.	(b)
10.	(c)	33.	(c)	56.	(d)	79.	(a)	101.	(a)	123.	(b)	145.	(b)	167.	(a)	189.	(c)
11.	(b)	34.	(d)	57.	(c)	80.	(c)	102.	(a)	124.	(b)	146.	(d)	168.	(b)	190.	(c)
12.	(c)	35.	(c)	58.	(c)	81.	(d)	103.	(b)	125.	(c)	147.	(b)	169.	(c)	191.	(c)
13.	(d)	36.	(a)	59.	(a)	82.	(b)	104.	(c)	126.	(c)	148.	(b)	170.	(b)	192.	(a)
14.	(d)	37.	(c)	60.	(c)	83.	(d)	105.	(c)	127.	(c)	149.	(c)	171.	(b)	193.	(b)
15.	(c)	38.	(b)	61.	(a)	84.	(d)	106.	(b)	128.	(c)	150.	(b)	172.	(c)	194.	(b)
16.	(d)	39.	(b)	62.	(d)	85.	(c)	107.	(b)	129.	(b)	151.	(a)	173.	(b)	195.	(a)
17.	(d)	40.	(d)	63.	(b)	86.	(a)	108.	(b)	130.	(b)	152.	(c)	174.	(a)	196.	(d)
18.	(d)	41.	(c)	64.	(c)	87.	(b)	109.	(b)	131.	(c)	153.	(c)	175.	(c)	197.	(b)
19.	(d)	42.	(c)	65.	(c)	88.	(d)	110.	(c)	132.	(c)	154.	(d)	176.	(b)	198.	(b)
20.	(c)	43.	(b)	66.	(a)	89.	(d)	111.	(c)	133.	(a)	155.	(b)	177.	(d)	199.	(c)
21.	(c)	44.	(c)	67.	(c)	90.	(a)	112.	(b)	134.	(c)	156.	(c)	178.	(d)	200.	(b)
22.	(b)	45.	(c)	68.	(d)	91.	(d)	113.	(a)	135.	(b)	157.	(b)	179.	(a)	201.	(b)
23.	(b)	46.	(b)	69.	(b)												

EXPLANATION

1. (b) Time = $\frac{\text{Distance}}{\text{Speed}}$

$\therefore$ Time = $\frac{\frac{4}{5}}{45} = \frac{4}{225}$ hr

Time (sec.) = $\frac{4}{225} \times 3600 = 64$ sec

2. (d) Distance = Constant

So, Speed $\alpha \frac{1}{\text{Time}}$

Ratio of time = $5 : \frac{5}{3}$

Ratio of time = 3 : 1

$\therefore$ Ratio of speed = 1 : 3

1 unit $\rightarrow$ 240 km/hr

3 units $\rightarrow$ 240 × 3 = 720 km/hr

So, Required speed = 720 km/hr

3. (c) Speed = 30 km/hr = $30 \times \frac{5}{18}$ m/sec. = $\frac{25}{3}$ m/sec

So, Time = $\frac{D}{S} = \frac{100}{25/3} = 12$ sec.

4. (c) Time taken at 5 km/hr

= $\frac{20}{5} = 4$ hrs.

Actual time

= $\left(4 - \frac{2}{3}\right) = \frac{10}{3}$ hrs.

Time taken at 8 km/hr

= $\frac{20}{8} = \frac{5}{2}$ hrs.

Time difference = $\frac{10}{3} - \frac{5}{2}$

= $\frac{5}{6}$ hr = 50 min.

$\therefore$ Required time = 50 min

5. (d) 15 min. = $\frac{1}{4}$ hrs.

1 hr $\rightarrow$ 5 kms.

$\frac{1}{4}$ hr $\rightarrow$ $\frac{5}{4}$ kms.

So, length of the bridge

= $\frac{5}{4}$ km = 1250 m

Alternate

V = 5km/hr = $\frac{5 \times 1000}{60}$ m/min.

= $\frac{250}{3}$ m/min

$l = \frac{250}{3} \times 15 = 1250$ m

6. (b) S = $\frac{D}{T} = \frac{250}{75}$ m/sec = $\frac{250}{75} \times \frac{18}{5}$

= 12 km/hr

7. (c) $L_t = L_p = l$

S = 90 km/hr = $\frac{90 \times 1000}{60}$ m/min

= 1500 m/min

$\Rightarrow l = L_t = L_p = \frac{1500}{2} = 750$ m

8. (d) Distance travelled in 14 sec.

= 50 + l

Distance travelled in 10 sec.= l

So, Speed of train

= $\frac{50}{14-10}$ m/sec

= $\frac{50}{4} \times \frac{18}{5}$ km/hr= 45 km/hr

9. (d) Speed = 10m/sec

= $10 \times \frac{18}{5}$ km/hr = 36 km/hr

10. (c) Distance covered in 100 sec.

= 800 + l

Distance covered in 60 sec.

= 400 + l

So, Distance covered in 40 sec

= (800+l) – (400+l) = 400 m

Speed $\rightarrow$ $\frac{400}{40}$ m/sec. = 10 m/s

Distance covered in 60 sec

= 10×60 = 600 meter

So, 400 + l = 600

$\Rightarrow l$ = 200 meter

11. (b) Speed = $\frac{D}{T} = \frac{125}{30}$ m/sec.

= $\frac{125}{30} \times \frac{18}{5}$ km/hr

= 15 km/hr

12. (c) T = $\frac{D}{S} = \frac{75 \times 18}{20 \times 5} = \frac{27}{2}$ sec.

= 13.5 sec.

13. (d)

	Actual	:	Reduced
Ratio of speed =	15	:	14
Ratio of time =	14	:	15

14 $\rightarrow$ 28 hrs

15 $\rightarrow$ 30 hrs

So, in 2 hrs it travels 10 kms

Speed = $\frac{10}{2}$ = 5 km/hr

14. (d) Speed of the train is

= 180 km/hr

$\because$ 1 km/hr = $\frac{5}{18}$ m/s

Since, 1 km = 1000 metres

1 hr = 60 × 60 seconds

$\therefore$ 1 km/hr = $\frac{1000}{60 \times 60}$

$\Rightarrow \frac{5}{18}$ m/s

$\therefore$ Speed in m/s = $180 \times \frac{5}{18}$

= 50 m/s

15. (c) Let the length of the train = l metre

and the length of the platform l_1 = 162 metres

another platform's length l_2

= 120 metres

(when a train crosses a platform i.e. it covers the distance equal to length of train + length of platform)

ATQ

$\frac{l + l_1}{\text{speed}} = \text{time}_1 = \frac{l + 162}{\text{speed}} = 18$ sec

$\Rightarrow \frac{l + 162}{18}$ = speed .....(i)

Again,

$\frac{l + l_2}{\text{speed}} = \text{time}_2$

= $\frac{l + 120}{\text{speed}} = 15$ second

= $\frac{l + 120}{15}$ = speed ....(ii)

Now, (i) = (ii) because the speeds of the Same train are equal

$\therefore \frac{l+162}{18} = \frac{l+120}{15}$

$\Rightarrow \frac{l+162}{6} = \frac{l+120}{5}$

$\Rightarrow 5l + 810 = 6l + 720$

$\Rightarrow 6l - 5l = 810 - 720$

$\Rightarrow l = 90$ metres

So, the length of the train is 90 metres.

Alternate

Length of the train = $\frac{l_1 t_2 - l_2 t_1}{t_1 - t_2}$

$= \frac{162\times15 - 120\times18}{18-15}$

$= \frac{3(162\times5 - 120\times6)}{3}$ = **90 metres**

16. (d) Here, speed of the running train is = 90 km/hr

and, Length of the train is

= 120 metres

We know that,

When A train crosses through the platform, it covers the distance equal to the length of platform + length of train

So, the time will be taken by the train =

$\frac{\text{Length of train} + \text{Length of platform}}{\text{Speed}}$

$= \frac{(120+230)\text{ metre}}{90\text{ km/h}} = \frac{350\times18}{90\times5}$

= 14 second

17. (d) The length of pole is considered as negligible i.e. = 0

i.e. When a train crosses a pole, it covers the distance equal to its length.

the time taken by the train

= 30 seconds

and speed = 60 km/h

then the length of the train

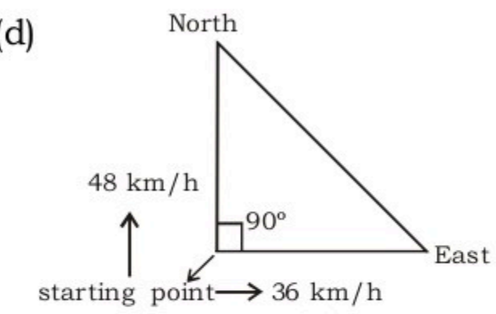
= 60 kmh × 30 seconds

$= 60 \times \frac{5}{18} \times 30$ metres

$= 10 \times \frac{5}{3} \times 30$

= 500 metres

18. (d)

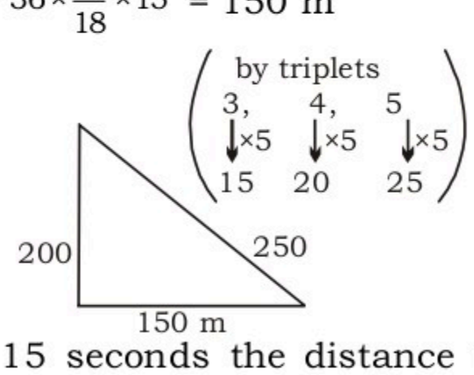


⇒ Distance, covered by car in 15 seconds with the speed of 48 kmph towards the north

$= 48\times\frac{5}{18}\times15 = 25 \times 8 = 200$ m

⇒ Distance, covered by car is 15 second with the speed 36 km/h towards the East.

$= 36\times\frac{5}{18}\times15 = 150$ m



After 15 seconds the distance between car is = 250 m

19. (d) Total distance covered by the train in 30 seconds with the speed of 30 m/s is

= 30 × 30 m/s

= 900 metres

Total distance = train's length + platform's length

900 = train's length + 600

(when train crosses platform it covers length equal to length of train + length of platform)

Alternate:-

Time = $\frac{\text{distance}}{\text{speed}}$ 30 sec

$= \frac{\text{platform + train length}}{\text{speed}}$

$30 = \frac{600 + \text{train}}{30}$

$\therefore$ length oftrain = 900 – 600

= 300 metres

20. (c)

	A	:	B	length
Ratio of A's and B's length →	5	:	3	$(5x : 3x)$
Ratio of A's and B's speed →	6	:	5	$(6y : 5y)$

We know that,

When a train crosses a pole, i.e. it covers the distance equal to its length.

Time taken by train A to cross the pole

$= \frac{\text{Total distance}}{\text{Speed}} = \frac{5x}{6y}$

Time taken by train B to cross the pole

$= \frac{\text{Total distance}}{\text{Speed}} = \frac{3x}{5y}$

A : B

Ratio of the their time

$= \frac{5x}{6y} : \frac{3x}{5y} = 25 : 18$

Alternate:-

Ratio of length 5 : 3

Ratio of speed 6 : 5

Ratio of time to cross a pole

$= 5 \times 5 : 6 \times 3 = 25 : 18$

21. (c) Time = $\frac{D}{S} = \frac{300+200}{25} = 20$ sec.

22. (b) Speed = 78 km/hr

$= \frac{78}{60}\times1000$ m/min

= 1300 m/min

Distance travelled in 1 min.

= 1300 m

$\Rightarrow 1300 = l + 800$

$\Rightarrow l = 500$ m = length of tunnel

23. (b) Speed = 132 km/hr

$= 132\times\frac{5}{18}$ m/sec $= \frac{110}{3}$ m/sec

$T = \frac{D}{S} = \frac{110+165}{\frac{110}{3}} = \frac{3(275)}{110}$

= 7.5 sec.

24. (c) ∵ Distance covered by the truck in a minute = 550 metres

Then, the speed of the truck will be

$\frac{550 \rightarrow \text{Metres}}{60 \rightarrow \text{Second}}$ $\left\{\text{Speed} = \frac{\text{Distance}}{\text{Time}}\right\}$

(1 minute = 60 seconds)

$= \frac{550}{60} \Rightarrow \frac{55}{6}$ m/s .....(i)

Whereas, distance covered by the bus in 45 minutes = 33 km.

Then, the speed of the bus will be = $\frac{33\text{ km}}{45\text{ minutes}} \Rightarrow \frac{33\times1000}{45\times60}$

$\left\{\begin{matrix}1\text{ km} = 1000\text{ metres}\\ 1\text{ min} = 60\text{ seconds}\end{matrix}\right\}$

$\Rightarrow \frac{110}{9}$ m/s ..... (ii)

So, the Ratio of their speeds will be

$= \frac{55}{6} : \frac{110}{9} = \frac{1}{2} : \frac{2}{3} = 3 : 4$

(Truck : Bus)

Alternate

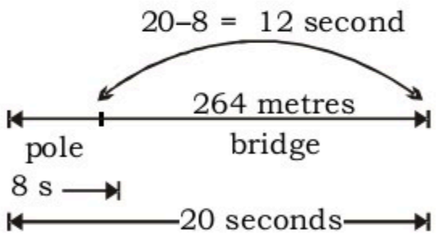
$\because \left\{\text{Speed} = \frac{\text{Distance}}{\text{Time}}\right\}$

Ratio (Truck : Bus) = $\frac{550}{60}$ m/s

: $\frac{33\times1000}{45\times60} = 3 : 4$

25. (d) A pole has negligible length with respect to the length of train i.e. = 0

when a train crosses a pole i.e. it covers the distance equal to its length



i.e. train crosses only bridge in = 12 second

then the speed of train

$= \frac{\text{264 metres}}{\text{12 second}}$

$= \left\{\text{Speed} = \frac{\text{Distance}}{\text{Time}}\right\}$

= 22 m/s

$= 22 \times \frac{18}{5} = 79.2$ km/h

$\left\{\because 1\text{ m/s} = \frac{18}{5}\text{ km/h}\right\}$

26. (a) Boy runs a distance of 20 km in 2.5 hrs. speed of boy

$= \frac{20 \text{ kms.}}{\frac{5}{2} \text{ hrs}}$ $\left\{\text{Time} = \frac{\text{Distance}}{\text{Speed}}\right\}$

= 8 km/hr

If the speed is doubled the new speed will be

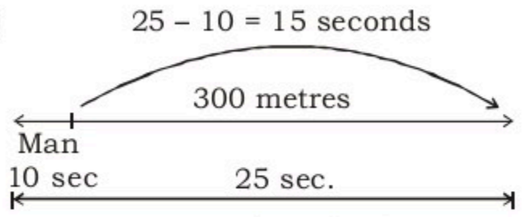
= 8 × 2 = 16 km/hr

then the time taken by the boy to run 32 kms

time = $\frac{32}{16}$ = 2 hrs.

$\left\{\text{Time} = \frac{\text{Distance}}{\text{Speed}}\right\}$

27. (c)



If train crosses the platform i.e. it covers the distance equal to the length of train and platform

In the question train crosses the man who stands on the platform in 10 seconds and crosses the man + platform in 25 seconds i.e. train crosses the platform whose length is 300 metres in 25 – 10 = 15 seconds, here train's length is not added.

So speed of the train

$= \frac{300}{15} \Rightarrow 20$ m/sec

length of the train = 10 × 20 = 200 metres (If train crosses the only man in 10 seconds)

Time taken by the train to cross a platform 200 metre long

$= \frac{\text{length of train + platform}}{\text{speed}}$

$= \frac{(200+200)}{20} = \frac{400}{20}$

Time taken by train

= 20 seconds.

28. (c) Let the speed of train = x m/s and, Length of train

= l metres

ATQ $\frac{l+162}{x} = 18 \left[\frac{\text{Distance}}{\text{speed}} = \text{time}\right]$

$\Rightarrow l + 162 = 18x$

$\Rightarrow$ length = $18x - 162$ ....(i)

Again,

$\frac{l+120}{x} = 15$

$\Rightarrow l + 120 = 15x$

$\Rightarrow$ length = $15x - 120$ .....(ii)

since, length of the train is equal

(i) = (ii)

$\Rightarrow 18x - 162 = 15x - 120$

$\Rightarrow 3x = 42$

$\Rightarrow x = 14$ m/s

$\Rightarrow$ Speed of train = 14 m/s

$= 14 \times \frac{18}{5} = 50.4$ km/h.

Alternate:-

Speed of train

$= \frac{\text{Difference of platform length}}{\text{Difference of time taken to cross the platform}}$

$\Rightarrow \frac{162-120}{18-15}$

$\Rightarrow$ Speed = 14 m/s. = 50.4 km/h

29. (b) Given:

Speed of Running train = 60 km/hr

Length of Running train = 110 metres

$\Rightarrow$ Length of standing train = 170 metres

$\Rightarrow$ Speed of the standing train = 0 km/hr

$\Rightarrow$ Time taken by Running train to cross the standing train

$= \frac{(110+170) \text{ metres}}{60 \text{ km/hr}}$

$\Rightarrow$ time = $\frac{280\times18}{60\times5}$

$\Rightarrow$ time = 16.8 seconds

30. (b) We know when a train crosses a pole/man/tree in these cases it crosses itself.

Therefore,

Length of the train = Speed × time

$\Rightarrow$ Length = $36\times\frac{5}{18}\times25$

= 250 metre

$\therefore$ length of train

= **250 metre.**

31. (c) Given,

Ratio of speed of trains = 6 : 7

Second train covers 364 kms in 4 hours then its speed = $\frac{364}{4}$

= 91 km/hr

In the question it is given that speed of the second train = 7 units

but actual speed = 91 km/hr.

i.e. 7 units $\rightarrow$ 91

$\Rightarrow$ 1 unit $\rightarrow$ 13 km.

Therefore,

Speed of the first train is $\Rightarrow$ 6R

$\Rightarrow$ 6 × 13 = 78 km/hr

32. (b) Total distance = $4\times3\frac{3}{4}$ = 15 km

Time taken on cycle = $\frac{15}{16.5}\times60$

= 54.55 minutes

33. (c) we can inferre that train crosses only platforms not its length in (25 – 15) = 10 seconds

Speed of the train

= $\frac{100 \text{ metres}}{10 \text{ sec}}$ = 10 m/s

$\because$ Train crosses the pole in 15 seconds

we know that when train crosses a pole/tree/man in these cases it covers the distance equal to its length.

Therefore,

Length of train = 15 × 10

=150 metres.

34. (d) Speed of the train = $\frac{700+500}{10}$

= 120ft/second

35. (c) 1km/hr = $\frac{5}{18}$ m/s

$\Rightarrow$90 km/hr = 90 × $\frac{5}{18}$ = 25 m/s

36. (a)Required distance

= $72\times\frac{5}{18}\times5$ =100 m

37. (c) Total time taken by train

= $10\frac{1}{2}$hr

$\therefore$ Total distance = $10\frac{1}{2}\times40$

= 420 km

38. (b) Speed of the train

= $\frac{10\times60}{12}$ = 50 km/hr

Now, New speed = 50 – 5

= 45km/hr

and, Required time = $\frac{10}{45}=\frac{2}{9}\times60$

= 13 minutes 20 seconds

39. (b) speed of the man

= $\frac{a}{b}$ km/hr

and, Required time

= $\frac{200}{1000}\times\frac{b}{a}=\frac{b}{5a}$ hours

40. (d) 1m/sec = $\frac{18}{5}$ km/hr

$\frac{10}{3}$ m/sec = $\frac{10}{3}\times\frac{18}{5}$

= 12km/hr

41. (c) In these type of questions use the given below formula to save your valuable time.

$\frac{S_1}{S_2}=\sqrt{\frac{T_2}{T_1}}$

where S_1, S_2 and T_1, T_2 are the respective speeds and times of the objects.

$\Rightarrow \frac{45}{S_2}=\sqrt{3\frac{1}{3}\div4\frac{4}{5}}$

= S_2 = 45 × $\frac{6}{5}$ = 54 km/hr

$\therefore$ Required speed = 54km/hr

42. (c) Total distance = 120 km

Total time = 15 hours

He covers half of the journey in

$\frac{3}{5}^{th}$ of the time

= $15\times\frac{3}{5}$ = 9 hours

Now, Remaining distance

= 120 – 60 = 60 km.

and, Remaining time

= 15 – 9 = 6 hours

Average speed to cover a distance of 60 km will be

= $\frac{60 \text{ km}}{6 \text{ hour}}$ = 10 km/hr

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

43. (b) Train covers a certain distance in 210 minutes at a speed of 60 kmph.

$\therefore$ Total distance, covered by train

= 60 × $\frac{210}{60}$

= 210 kms.

Now, the time taken by the train to cover the same distance i.e. 210 kms at a speed of 80 kmph is

= $\frac{210}{80}$ time = $2\frac{5}{8}$ hours

44. (c) The man covers $\frac{9}{20}$ of the journey by bus

$\therefore$ Remaining journey

= $1-\frac{9}{20}=\frac{11}{20}$

$\Rightarrow$ According to the question,

$\frac{11}{20}$ of the journey = $\frac{20}{11}\times10$

= 18.18 km.

45. (c) Distance covered by train at 36 kmph in 55 seconds is = 36 kmph × 55 second (distance = time × speed)

= 36 × $\frac{5}{18}$ m/s × 55 second

= 550 metre

$\therefore$ 550 metre = total distance

Hence,

550 metre = length of the trains + length of bridge

550 metre = 200 m + length of bridge

Length of bridge = 350 metres.

Alternate

Time = $\frac{l_1+l_2}{\text{speed}}$

$\Rightarrow 55=\frac{200+l_2}{36\times\frac{5}{18}}\Rightarrow l_2=350m$

Length of the bridge = 350 metres.

46. (b) According to the question

Crossing time = $\frac{l_1+l_2}{\text{speed}}$

$\Rightarrow \frac{270+180}{36\times\frac{5}{18}}=\frac{450}{10}$ = 45 second

47. (a)

	Cyclist	:	Jogger
Ratio of distance →	2	:	1
Ratio of time →	1	:	2

Ratio of their speed (Jogger : Cyclist)

= $\frac{1}{2}:\frac{2}{1}\Rightarrow$ 1 : 4

48. (d) In the first situation,

$\Rightarrow$ Total distance covered by train

= 80 × $4\frac{1}{2}$ = 360 kms.

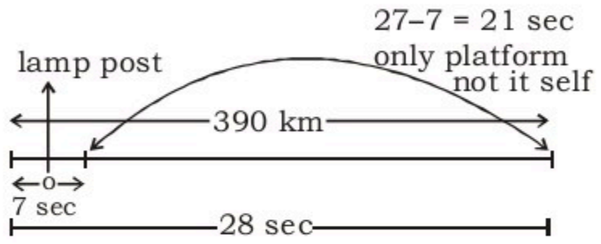
$\Rightarrow$ Therefore,

The speed of the train to cover the same distance 360 km in 4 hours is

= $\frac{360}{4}\left\{\text{speed}=\frac{\text{distance}}{\text{time}}\right\}$

= **90 km/h**

49. (b)



⇒ According to figure that has shown here train crosses only platform (not itself) in 21 sec.

⇒ speed of the train

$$= \frac{390 \text{ metre}}{21 \text{ sec}} \Rightarrow \frac{130}{7} \text{ m/s}$$

We know that,

When train crosses only object that has no distance (i.e. tree, lamp post, man etc.) in that condition train covers equal distances to itself.

⇒ So the length of the train

$$= \frac{130}{7} \text{m/s} \times 7 \text{sec}$$

= **130 metres**

50. (c) length of the train = Speed × time = 36 km/hr × 10 sec

$$= 36 \times \frac{5}{18} \text{ m/s} \times 10 \text{ sec}$$

= 100 metres

Therefore,

Time taken by train to cross a plateform of 55 metre long in time

$$= \frac{(100+55)}{36 \times \frac{5}{18}} = \frac{155}{10}$$

Time = $15\frac{1}{2}$ sec.

51. (b) Total distance, covered by train in 30 sec. with, speed of 60 km/hr.

Distance = 60 kmph × 30 sec

$$= 60 \times \frac{5}{18} \text{ m/s} \times 30 \text{ sec}$$

= 500 metres

Distance of train + length of plateform = 500 m

200 + plateform = 500

Length of plateform

= 500 – 200 = **300 metres**

52. (b) $\frac{2}{5}^{th}$ of journey = 1200 km

$$\therefore \text{ Total journey} = \frac{1200}{2} \times 5$$

= 3000 kms.

Distance travelled by car

$$= 3000 \times \frac{1}{3} = 1000 \text{ metre}$$

Therefore,

Remaining distance covered by train is

= 3000 – (1200 + 1000)

= **800 metres**

53. (a) Time will be taken by train if it does not stop

$$= \frac{\text{distance}}{\text{speed}} = \frac{999 \text{ kms}}{55.5 \text{ km/hr}}$$

without stop = 18 hr

But if stops on the way for 1 hour 20 min before reaching B.

Total time = 18 hr + 1 hour 20 min

= 19 hours 20 min

Reaching time at B = 6 am + 19 hour 20 min. = 1:20 am

54. (b) Time taken by man if he did not stop

$$= \frac{5\text{km}}{10 \text{ kmph}} = \frac{1}{2} \text{h} = 30 \text{ min}$$

∵ man takes rest for 5 minutes on each km

Total rest time = 5 × 4 = 20 min

total travelling time = 30 min + 20 min = **50 min**

55. (a) According to question,

	A	:	B	:	C
	2	:	1		
			3	:	1
	A	:	B	:	C
Ratio of speed	6	:	3	:	1
Ratio of time	$\frac{1}{6}$	:	$\frac{1}{3}$	:	$\frac{1}{1}$

$$\left[\text{time} \propto \frac{1}{\text{speed}}\right]$$

= 1 : 2 : 6 z

×1/4 ↓

$\frac{3}{2}$

Time taken by A = 1 ratio

$$= 1 \times \frac{1}{4} \text{ hours} = \textbf{15 min}$$

56. (d) Total distance = 310 kms

Distance travelled by truck in $1\frac{1}{2}$ hours with speed 90 km/hr

$$= 1\frac{1}{2} \text{ hour} \times 90 \text{ km/h}$$

= 135 km.

Remaining distance

= 310 – 135 = 175 km.

Time will be taken to cover 175 km with speed 70 km/hr

$$= \frac{175}{70} \Rightarrow 2.5 \text{ hours}$$

Total time = 2.5 + 1.5 = 4 hours.

57. (c) Total distance = 60km/hr×1 hour = 60 km

Therefore,

Time will be taken by another car to travel the same distance with 40 km/hr

$$= \frac{60}{40} \Rightarrow \frac{3}{2} \text{hr.}$$

58. (c) **Method.**

$$\text{Time} = \frac{\text{Distance}}{\text{speed}}$$

$$10 = \frac{50+100}{\text{speed}} \Rightarrow \text{Speed} = \frac{150}{10}$$

train's speed = 15 m/s

59. (a) Here length of pole is considered 0 metre

Time will be taken by train to cross the poll

$$= \frac{300 \text{ m}}{54 \times \frac{5}{18} \text{ m/s}} = \frac{300}{15}$$

Required time = 20 seconds

60. (c) Total distance = Speed × Time

= 55 km/h × 4 hours

= 220 kms

New speed after increment

= 55 + 5 = 60 kmph

Time taken with new speed

$$= \frac{220 \text{ km}}{60 \text{ km/hr}}$$

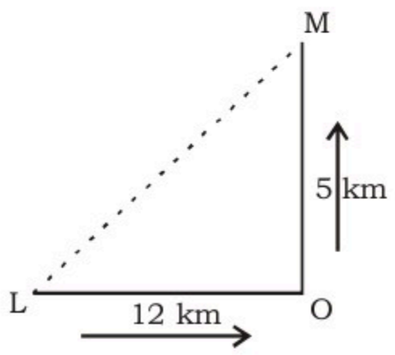
$$= 3\frac{4}{6} \text{ hr} = 3 \text{ hours} + \frac{2}{3} \times 60 \text{ min}$$

= 3 hours + 40 min.

Diff. of time = 4 hours – (3 hours + 40 min) = 20 min

61. (a) Distance covered in 1 min = 50 m
Distance covered in 2 min = 90 m
Similary, Ist min IInd IIIrd min ..... 15^{th} min
Distance → 50m + 90m + 130m + ...
By using A.P,
a = 50m, d = (90 – 50) = 40 m
Tn = a + (n – 1)d
= 50 + (15–1)×40
= 50 + 560
= **610 m**

62. (d) According to the question,
⇒ Using pythagoras theorem
⇒ $(ML)^2 = (MO)^2 + (LO)^2$
⇒ $(ML)^2 = (12)^2 + 5^2$
⇒ **ML = 13 km**



63. (b) We know, 1 km = 1000 metre
⇒ 2 km 5 metre = 2 km 5 metre
$= 2\,km + \frac{5}{1000}\,km$
= 2 km + .005 km = 2.005 km

64. (c) Circumference of wheel
$= 2\pi r$
$\Rightarrow 2 \times \frac{22}{7} \times \frac{70}{2}$ = **220 cm**
Speed per hour
$= \frac{220 \times 400 \times 60}{1000 \times 100}$ = **52.8 km/h**

65. (c) As we know
$\Rightarrow$ 1 m/s = $\frac{18}{5}$ km/hr
$\Rightarrow$ 20 m/s = $\frac{18}{5} \times 20$ km/hr
= 72 km/h

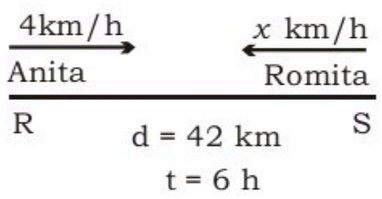
66. (a) Let the length of train be l metre.
According to the question
$\text{time} = \frac{distance}{speed}$
$\Rightarrow 100 = \frac{500+l}{speed\ of\ train}$
$\Rightarrow \text{speed} = \frac{500+l}{100}$ .....(i)

Again,
$60 = \frac{250+l}{speed\ of\ Train}$
$\text{speed} = \frac{250+l}{60}$ .....(ii)
Equating (i) & (ii)
$\Rightarrow \frac{500+l}{100} = \frac{250+l}{60}$
$\Rightarrow 1500 + 3l = 1250 + 5\,l$
$\Rightarrow 2\,l = 250$
$\therefore$ length of train = 125 m

67. (c) Speed = $\frac{\text{Distance}}{\text{Time}}$
Speed = $\frac{250}{50}$ = 5 m/s
Speed = $5 \times \frac{18}{5}$ = 18 km/hr

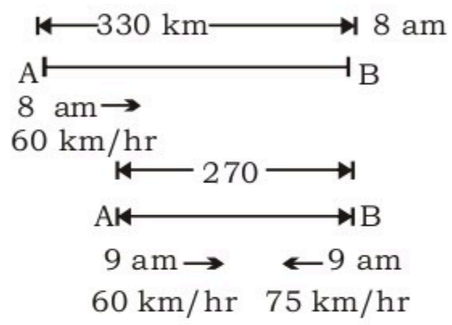
68. (d) Circumference of the circle = $2\pi r$
$= 2 \times \frac{22}{7} \times 42$ = 264 cm
Distance cover in 1 sec
= 264 × 5 = 1320 cm

69. (b)Total stops taken by the man to cover a distance of 90 km is
$= \frac{90}{7} \Rightarrow$ 12 stops + 6 km
$\therefore$ Time taken in 12 stops
= 12 × 6 min.
= 72 min {1 hour 12 min}
Time taken by the man to cover 90 km with 18 km/hr without stops = $\frac{90}{18}$ = 5 hours
$\therefore$ Total time to cover total distance
= 5 hours + 1 hour 12 min
= **6 hours 12 min.**

70. (c) Let speed of Romita be x km
ATQ:


$(4 + x) = \frac{42}{6}$ $\left(S = \frac{d}{t}\right)$
$4 + x = 7$
x = 3 km/h

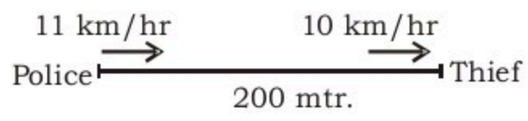
71. (c) $V_{rel.} = V_{train} - V_{man}$
(as moving in same direction)
$V_{rel.}$ = 20 – 10 = 10 m/sec.
Time = $\frac{D}{V_{rel}} = \frac{180}{10}$ = 18 sec.

72. (c)


T = $\frac{270}{60+75}$ = 2 hrs
So, time at which they meet
= 11:00 am

73. (b)Relative speed
= 5 + 5
= 10 m/min.
Total time taken to meet each other = $\frac{1200}{10}$
= 120 minutes

74. (b)$V_{rel.}$ = 63 – 3 = 60 km/hr.
T = $\frac{500 \times 18}{60 \times 5}$ sec. = 30 sec
$\therefore$ Required time = 30 sec

75. (a)


$V_{rel.}$ = 11 –10 = 1 km/hr
$= \frac{1 \times 1000}{60}$ mt/min
Distance between them after 6 min. = $200 - \frac{1000}{60} \times 6$ = 100 mtr.

76. (b) $V_{rel.}$ = 77+67 = 144 km/hr
$= 144 \times \frac{5}{18}$ m/sec = 40 m/sec
$\therefore T = \frac{D}{V_{rel.}} = \frac{140+160}{40} = \frac{300}{40} = 7.5$ sec.

77. (c) $V_{rel.} = \frac{2 \times 120}{T} = \frac{240}{12}$ = 20 m/sec.
$V_{rel.} = V_1 + V_2 = 2V$ = 20 m/sec
So, V = 10 m/sec = $10 \times \frac{18}{5}$ = km/hr
= 36km/hr

78. (a) $V_{rel.}$ = (21–15) m/min = 6 m/min

Time taken to catch the thief

$= \frac{114}{6}$ min = 19 min

79. (a) Time taken by A = 252 sec

$= 2^2 \times 3^2 \times 7$

Time taken by B = 308 sec

$= 2^2 \times 7 \times 11$

Time taken by C = 198 sec

$= 2 \times 9 \times 11$

Together will meet at starting point

= LCM (252, 308, 198)

$= 2^2 \times 3^2 \times 7 \times 11$ sec

So required time (min.)

$= \frac{4 \times 9 \times 7 \times 11}{60}$

= 46min. 12 sec.

80. (c) $S_1 = \frac{120}{10}$ m/sec. = 12m/sec

$S_2 = \frac{120}{15}$ m/sec = 8 m/sec

Time taken to cross each other

$= \frac{l_1 + l_2}{V_{rel.}} = \frac{240}{20}$ = 12 sec.

81. (d)Total distance covered by the length of both trains = 50 m + 75 m

and, Their relative speed in same direction = 68 – 50 = 18 km/hr

$\because$ (Speed subtracted in same direction)

then, the time to cross each other will be

$= \frac{125 \text{ m/s}}{18 \text{ kms}}$

$= \frac{125 \times 18}{18 \times 5}$ m/s

$\left\{\because 1 \text{ km/h} = \frac{5}{18} \text{m/s}\right\}$

= 25 second

Alternate:-

Crossing time of each other in same direction will be

$= \frac{(l_1 + l_2)}{(S_2 - S_1) \times \frac{5}{18}} = \frac{50 + 75}{(68 - 50) \times \frac{5}{18}}$

$= \frac{125}{18} \times \frac{18}{5}$ = 25 second

82. (b) The distance which will be covered by the constable to catch the thief = 200metres.

Their relative speeds in same direction

8 km/h – 7 km/hr = 1 km/hr

$= \frac{5}{18}$ m/s.

$\left\{\because 1 \text{ km/h} = \frac{5}{18} \text{m/s}\right\}$

(i.e. Constable reaches 5 m near the theif in every 18 second with Relative speed)

Then the Required time

$= \frac{\text{Distance}}{\text{Speed}} = \frac{200 \text{ metres}}{\frac{5}{18} \text{ m/s}}$

$= \frac{200}{5} \times 18$ second

= 720 second = $\frac{720}{60}$ minutes

$\{\because$ 1m = 60 seconds$\}$

= 12 minutes

Alternate:

Required time

$= \frac{\text{distance}}{\text{Relative speed in same direction}}$

$= \frac{200 \text{ m/s}}{(8-7) \times \frac{5}{18} \text{ m/s}}$

= 720 second

$= \frac{720}{60}$ minutes = 12 minutes

83. (d) In this question it is given that A man who sits in the slower train cross the faster train it means faster train cross the man in 18 second

$\Rightarrow$ Relative speed of faster train and man in the same direction = 58 – 30 = 28 kmph

So distance covered by faster train in 18 seconds = 28 kmph × 18 sec.

$= 28 \times \frac{5}{18} \times 18$ = **140 metres.**

84. (d) $\because$ Distance = Time × Speed

A covers the distance with the uniform rate of 4 km/hr in 4 hours is = 4 × 4 = 16 km

B's speed = 10 km/hr

Their relative speed in same direction = (10–4) kmph

6 km/h

After 4 hour, B will cover the distance with Relative speed 6 km per hour.

then, 16 km, will be covered by B in

$= \frac{16 \text{ km}}{6 \text{ k/h}}$ = 2.67 h

i.e. B will have chased A in 2.67 h.

then B will cover in 2.67 hours with the speed of 10 km/h

= 2.67 × 10 = 26.7 km.

$\therefore$ B will cover 26.7 km from starting point.

85. (c) Let the train's speed = x km/hr.

$\because$ When train will cross a man then it covers only its length.

Now, According to the ques.

$\therefore (x - 3) \times \frac{10}{60} = (x - 5) \times \frac{11}{60}$

x = 25 km/hr

NOTE

Products of time × speed is always subtracted if both the men are running in the same direction and the products of time × speed is added only if the men are running opposite direction.

$\Rightarrow$ Here train's direction is not considered.

But attention please $\Rightarrow$ Always divided by the difference of time.

Alternate

Let speed of the train is

= x km/h

Relative speed with the first man

= (x – 3)km/h (same direction)

Relative speed with second man

(x – 5) km//h

Distance, covered by the train in 10 seconds in the respect of the first man

= (x – 3)km/h

× 10 sec. (Dis = Time × speed) ....(i)

$\Rightarrow$ Distance, covered by the train in 11 second in respect of the second man

= (x – 5)km/h×11 sec.....(ii)

$\because$ length of the train is equal

So, Here we put (i) = (ii)

(x – 3) km/h × 10 sec

= (x – 5)km/h×11 sec

$10x - 30 = 11x - 55$

$11x - 10x = 55 - 30$

x = **25 km/h**

86. (a) relative speed = 60 + 50
= 110km/h.

Time taken = $\frac{220}{110}$ = 2hr.

87. (b) Let the length of both the trains = l metre (equal)

speed of the first train = s_1 m/s

and another's speed = s_2 m/s

ATQ,

$\Rightarrow \frac{l}{s_1} = 3 \Rightarrow s_1 = \frac{l}{3}$ .....(i)

Again $\Rightarrow \frac{l}{s_2} = 4 \Rightarrow s_2 = \frac{l}{4}$ ..(ii)

Crossing time in opposite direction to each other.

$= \frac{\text{total distance}}{\text{total speed}} = \frac{l+l}{\frac{l}{3}+\frac{l}{4}} = \frac{2l}{7l} \times 12$

$= \frac{24}{7}$ sec. $= 3\frac{3}{7}$ sec.

88. (d) Speed of the first train

$= \frac{150}{15} = 10$ m/s

Time taken by trains to cross each other = 12 sec.

and, Relative speed of two trains

$= \frac{150+150}{12} = 25$ m/s

$\therefore$ Speed of the second train

$= (25 - 10) \times \frac{18}{5} = 54$ km/hr.

89. (d) Relative speed of the two trains

$= (48 + 42) \times \frac{5}{18} = 25$m/s

Distance travelled in 12 sec. at 25 m/s

$= 25 \times 12 = 300$ m

Length of first train

$= 300 \times \frac{2}{3} = 200$ m

Distance travelled by first train in 45 seconds

$= 48 \times \frac{5}{18} \times 45 = 600$ m

$\therefore$ Length of the platform

= 600 – 200 = 400 metres

90. (a) Let the speed of truck is = x km/h

Their relative speed in same direction

= $(45 - x)$ km/h (Here $(45 - x)$ has been written because bus crosses the truck which is running 150 metres ahead of it. i.e. Truck speed will be lower than that of bus)

According to the question,

Time = $\frac{\text{total distance}}{\text{total speed}}$

$= \frac{150}{(45-x)\times\frac{5}{18}} = 30$

$= \frac{150\times18}{(45-x)\times5} = 30$

$= x = 27$ km/h

So speed of the truck is **27 km/h**

91. (d) Their relative speed in same direction

= 36 – 9 = 27 km/h

Time taken by train to cross the man

$= \frac{150}{27}$

$\left[\frac{\text{Distance}}{\text{Speed}} = \text{time}\right]$

Time = $\frac{150}{27\times\frac{5}{18}}$

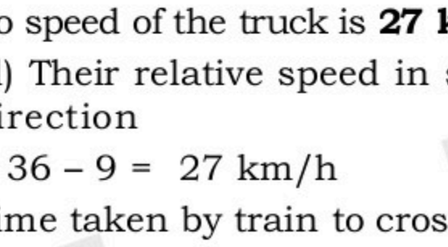
$\left[1 \text{ km/h} = \frac{5}{18} \text{m/s}\right]$

Time = $\frac{150\times18}{27\times5}$

Time = $\frac{30\times2}{3}$

$\therefore$ Time = **20 second**

92. (c) 80 km (one side Journey)



Total distance = 80 × 2

160 kms.

Total time = 1 + 1 = 2 hours

Avg. speed

$= \frac{\text{total distance}}{\text{total time}} = \frac{160}{2}$

Avg. Speed = 80 km/hr

Alternate

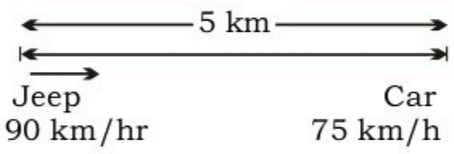
Average Speed = $\frac{2S_1S_2}{S_1+S_2}$

$= \frac{2\times80\times80}{80+80}$

$= \frac{2\times80\times80}{160}$

Average Sped = 80 kmph

93. (b)



Their relative speed in same direction = (90 – 75) $\Rightarrow$ 15 kmph

Time taken by Jeep to catch car

$= \frac{5}{15} = \frac{1}{3}$ hour $= \frac{1}{3} \times 60$min

= 20 min.

94. (c)

	Bus	:	(Bus + Man)
Ratio of time=	10 min	:	8 min
Ratio of speed =	8	:	10
	= 4	:	5
	= 4	:	4+1

$\Rightarrow$ Here, 4 units $\rightarrow$ 20 kmph

1 unit $\rightarrow$ 5 kmph

$\because$ Speed of the man = 1 unit

$\therefore$ Speed of the man

= 1 × 5 = **5 kmph**

95. (d) Let the speed of train = x km/hr

Length of train = 300 metres

Their relative speed in same direction

= $(x - 3)$ km/hr

According to the question,

$\frac{(300+0)\text{ m}}{(x-3)\times\frac{5}{18}\text{ m/s}} = 33$

[Here man's length is 0 metre]

$\Rightarrow \frac{300\times18}{(x-3)\times5} = 33$

$\Rightarrow \frac{100\times18}{5x-15} = 11$

$\Rightarrow 1800 = 55x - 165$

$\Rightarrow 55x = 1965$

$\therefore$ Speed of the train

$7 = \frac{1965}{55}$

$= 35\frac{8}{11}$ km/hr

96. (a) Relative speed of man & train

$= \frac{100\times5}{36} \times \frac{18}{5}$

$= 50\text{km/hr}$

$\therefore$ speed of train

$= 50 - 5 = 45$ km/hr

97. (b) Let the length of each train = l

Relative speed

$= (46-36)\times\frac{5}{18} = \frac{25}{9}$ m/s

According to the question,

$\frac{l+l}{\frac{25}{9}} = 36$

$= 2l = \frac{25}{9}\times 36 = l = 50\text{m}$

$\therefore$ length of each train = 50m

98. (c) Relative speed

$= (45-40)\times\frac{5}{18}$

$= \frac{25}{18}$ m/s

$\therefore$ Required distance

$= \frac{25}{18}\times45\times60$

= 3750 metres or 3.75 km

99. (b) Let the speed of the cars be S_1 and S_2

and, $S_1 - S_2 = \frac{70}{7} = 10$ ..... (i)

also, $S_1 + S_2 = \frac{70}{1} = 70$ ..... (ii)

from equation (i) and (ii)

$S_1 = \frac{10+70}{2} = 40$ km/hr

and $S_2 = \frac{70-10}{2} = 30\text{km/hr}$

$\therefore$ Required speeds are 40km/hr and 30km/hr

100. (b) Relative speed = 24 – 18

= 6km/hr

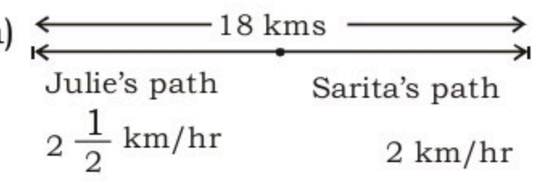
time required by faster train to overtake slower train

$= \frac{27}{6} = 4\frac{1}{2}\text{hr}$

$\therefore$ Distance between Q and R

$= 18\times4\ \frac{1}{2} = 81$ km.

101. (a)



Their relative speed in opposite direction

$= 2\frac{1}{2}$ km/h + 2 km/hr

$= 4\frac{1}{2}$ km/hrs

$\Rightarrow$ Time taken by them to cover a distance of 18 kms is

$= \frac{18}{\frac{9}{2}} = 4$ h

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

102. (a) Let the speed of second train = x km/hr

Their relative speed in opposite direction

= (43.2 + x) = km/hr

According to the question,

Time $= \frac{l_1+l_2}{\text{speed}}$

$\Rightarrow 10\text{sec} = \frac{(150+120)\text{m}}{(43.2+x)\times\frac{5}{18}\text{m/s}}$

$\Rightarrow 10 = \frac{270\times18}{(43.2+x)\times5}$

$43.2\times5 + 5x = 486$

$\Rightarrow x = \frac{486-216}{5}$

$\therefore$ Speed of the second train

= 54 km/hr

103. (b) Let the speed of second train is = x km/hr

$\Rightarrow$ time $= \frac{l_1+l_2}{\text{Relative speed in oppo. direction}}$

$\Rightarrow 6 = \frac{(125+125)}{(65+x)\times\frac{5}{18}}$

$\Rightarrow 6 = \frac{250\times18}{(65+x)\times5}$

$\Rightarrow 65 + x = 50\times3$

$\Rightarrow x = 150 - 65 \Rightarrow x = 85$ km/hr

104. (c) Total distance covered by man in (1:30 pm – 10:00 am) = $3\frac{1}{2}$ hour at a speed of 12 km/hr

$= 12\times3\frac{1}{2}$

= 42 km. (Total distance)

Time taken by his elder brother to catch him

$= 3\frac{1}{2}$ hour – 1 hour 15 min.

$\therefore$ Brother's time = 3 hr 30 min – 1 hr 15 min = 2 hr 15 min

$= 2\frac{15}{60} = 2\frac{1}{4} \Rightarrow \frac{9}{4}$ hour

$\Rightarrow$ Brother's speed

$= \frac{42}{\frac{9}{4}} \left\{\text{speed} = \frac{\text{distance}}{\text{time}}\right\}$

$= 18\frac{2}{3}$ km/h

105. (c) The fast train completely passes a man sitting in the slow train, In this condition it covers distance equal to its length.

Relative speed in same direction (40 – 20)

= 20 km/h

Therefore, length of the train

= speed × time

= 20 km/hr × 5 sec

$= 20\times\frac{5}{18}$ m/s × 5 sec

$= 27\frac{7}{9}$ metres

106. (b) Time taken by trains to cross each other in oppo. direction

$= \frac{l_1+l_2}{\text{relative speed in oppo. direction}}$

$= \frac{(180+120)}{(65+55)}$

$= \frac{300}{120\times\frac{5}{18}}$

= **9 second**

107. (b) Distance covered by thief in (2 pm – 1: 30 pm) = $\frac{1}{2}$ hr at speed of 40 km/hr

= 40 × $\frac{1}{2}$ = 20 kms.

Their relative speed in same direction
= (50 – 40) = 10 km/hr
According to the question,
20 km, is the distance that has to be covered by owner to catch the thief.

Required time = $\frac{20 \text{ km}}{10 \text{ km/hr}}$

= 2 hours
Therefore, he will overtake the thief at
= 2 pm + 2 hr. = 4 pm.

108. (b) Let the speed of first train be s_1 km/hr and speed of second train is s_2 km/hr
As we know,

$$\text{Time} = \frac{\text{total distance}}{\begin{pmatrix}\text{relative speed in}\\ \text{same/opp. direction}\end{pmatrix}}$$

In the same direction.

$$\Rightarrow 27 \text{ sec} = \frac{(100+95)}{(s_1 - s_2)\times\frac{5}{18}}$$

$$\Rightarrow 27 = \frac{195\times18}{(s_1 - s_2)\times5}$$

$$\Rightarrow s_1 - s_2 = 26 \quad \text{.....(i)}$$

In the oppo. direction,

$$\Rightarrow 9 = \frac{(100+95)}{(s_1 + s_2)\times\frac{5}{18}} \Rightarrow 9 = \frac{195\times18}{(s_1 + s_2)\times5}$$

$$\Rightarrow s_1 + s_2 = 39 \times 2$$

$$\Rightarrow s_1 + s_2 = 78 \quad \text{.....(ii)}$$

From equation (i) and (ii)

$$\Rightarrow s_1 - s_2 = 26$$

$$\Rightarrow s_1 + s_2 = 78$$

$$\Rightarrow s_1 = \frac{26+78}{2} \Rightarrow s_1 = \frac{104}{2}$$

$$\Rightarrow s_1 = 52 \text{ km/hr and } s_2 = 26 \text{ km/hr}$$

109. (b) Their Relative speed in same direction
= 40 – 30 = 10 km/hr
Distance covered by P in 30 min
= 30 km/hr × 30 min ⇒ 15 km.
Time will be taken by Q to catch P

= $\frac{15}{10} \Rightarrow$ **$\frac{3}{2}$ hours**

110. (c) Let length of train = l metre

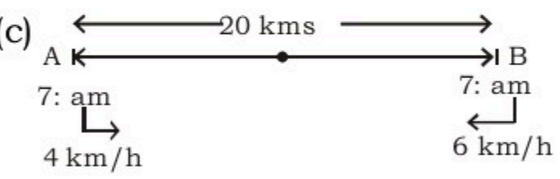
$$\Rightarrow \text{Time} = \frac{\text{Distance}}{\text{Relative speed in opp. direction}}$$

$$\Rightarrow 4 \text{ sec} = \frac{l+0}{(84+6)\times\frac{5}{18}\text{m/s}}$$

$$\Rightarrow 4 = \frac{l}{90\times\frac{5}{18}} \Rightarrow l = 100\text{m}$$

Therefore, length of the train = 100 m

111. (c)

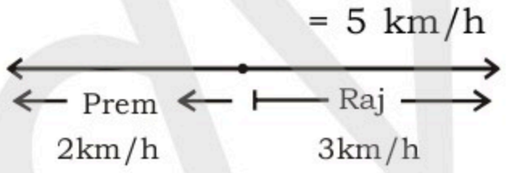


Their relative speed in opp. direction
= 4 + 6 = 10 km/hr
Time will be taken to cover 20 km with relative speed 10 km/hr

$$\Rightarrow \text{Time} = \frac{20 \text{ km}}{10\text{km/h}} = 2 \text{ hours}$$

∴ Meeting time = 7 am + 2 hr.
= 9 am

112. (b) Their relative speed in opposite direction
= (2 + 3)
= 5 km/h



Therefore, distance between Raj and Prem after 2 hours
= 2 × 5
= 10 km {distance = speed × time}

113. (a) Let the length of first train = l metre
⇒ and another = l_2 metre
⇒ Speed of the first train

$$= \frac{150 \text{ m}}{30 \text{ s}} = 5 \text{ m/s}$$

Case – 2

$$10 = \frac{(150+150)\text{metres}}{\text{speed of 2nd train + 5m/s}}$$

$$\Rightarrow 10 = \frac{300}{s_2+5} \Rightarrow 1 = \frac{30}{s_2+5}$$

$$\Rightarrow s_2 = 25 \text{ m/s}$$

⇒ Speed of the second train
= 25 m/s

$$= 25\times\frac{18}{5} \text{ km/h} \left[\because 1\text{m/s} = \frac{18}{5} \text{ km/h}\right]$$

= **90 km/hr**

114. (b) Avg. speed = $\frac{\text{Total Distance}}{\text{Total Time}}$

$$= \frac{10+12}{\frac{10}{12}+\frac{12}{10}} \simeq 10.8 \text{ km/hr}$$

115. (b) Avg. speed = $\frac{\text{Total Distance}}{\text{Total Time}}$

$$= \frac{600+800+100}{\frac{600}{80}+\frac{800}{400}+\frac{100}{50}} \Rightarrow \frac{1500\times2}{23}$$

$$= \frac{3000}{23} = \mathbf{130\frac{10}{23}\ km/hr}$$

116. (b) ∵ Distance = Speed × Time
∴ Distance covered by the train with the speed of 30 kmph in 12 minutes is

= 30 × $\frac{12}{60}$ = 6 km.

Distance covered by the same train with the speed of 45 kmph in 8 minutes is

= 45× $\frac{8}{60}$ = 6 km

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

$$\Rightarrow \frac{(6+6)\text{km.}}{(12+8)\text{min.}} = \frac{12}{20}\times60$$

= 36 kmph

117. (b) Let total distance = d km
According to the question,

$$\Rightarrow \frac{\frac{d}{2}}{40} + \frac{\frac{d}{2}}{60} = 10 \text{ hours}$$

$$\Rightarrow \frac{d}{80} + \frac{d}{120} = 10$$

$$\Rightarrow \frac{3d+2d}{240} = 10 \Rightarrow 5d = 2400$$

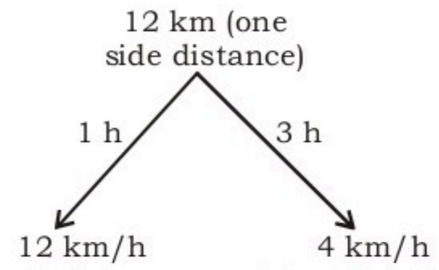
$$\Rightarrow d = \frac{2400}{5} \Rightarrow d = \mathbf{480\ km}$$

Alternate

Average speed= $\frac{2xy}{x+y} = \frac{2\times40\times60}{100}$

= 48 km/hr
Distance = S × T = 48 × 10
= 480 km.

118. (c)



Total distance = 12 × 2 = 24 km

Total time = 1 + 3 = 4 hours

Average speed = $\frac{24}{4}$ = **6 km/h**

Alternate

Average speed = $\frac{2\,s_1\,s_2}{s_1 + s_2}$

= $\frac{2\times12\times4}{4+12} = \frac{96}{16}$

Average speed = **6 km/h**

119. (a) Given,

Train covers 3584 kms in 2 days 8 hour

(2 days 8 hours = $\frac{7}{3}$ days)

Average speed = $\frac{3584}{\frac{7}{3}}$

= 1536 km/day = $\frac{1536}{24}$ = 64 km/h

Distance covered in two days = 1440 + 1608 = 3048 km.

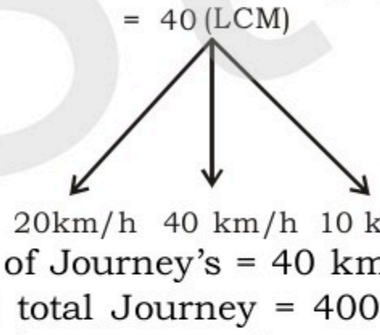
Remaining distance for third day = 3584 – 3048 = 536 km.

Third day 536 km is covered in 8 hour with speed of = $\frac{536}{8}$

= 67 km/h (3rd day total 536 km distance coverd by 67 km/hr in 8 hr)

∴ Difference of Average speed = 67 – 64 = **3 km/hr**

120. (a) Let 10% of journey = 40 (LCM)



10% of Journey's = 40 km.

Then total Journey = 400 kms

and, Average speed

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

30% of journey = $400 \times \frac{30}{100}$ = 120 km.

60% of journey = $400 \times \frac{60}{100}$ = 240 km.

10% of journey = $400 \times \frac{10}{100}$ = 40 km.

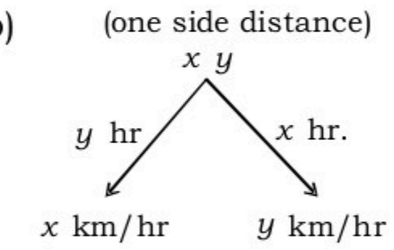
Avg. speed = $\frac{400}{\frac{120}{20}+\frac{240}{40}+\frac{40}{10}}$

Average speed = $\frac{400}{(6+6+4)}$

Average speed = $\frac{400}{16}$

Average speed = 25 km/hour

121. (b)



Total distance = 2xy km

Total time = (x + y) hours

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

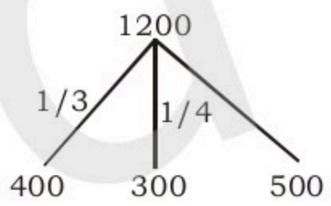
Average speed = $\frac{2xy}{x+y}$ km/hr

122. (a) Average speed = $\frac{2xy}{x+y}$

⇒ Avg. speed = $\frac{2\times40\times60}{40+60}$

∴ Avg. speed = **48 km/h**

123. (b) Let the total distance = 1200 km



Total time taken = $\frac{400}{25}+\frac{300}{30}+\frac{500}{50}$

16 + 10 + 10 = 36 hours

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

= $\frac{1200}{36}$ = $33\frac{1}{3}$ km/hr

124. (b) Total distance

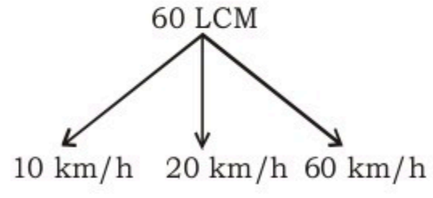
= 6 × 5 + 3 × 6 = 48 km

Total time = 6 + 3 = 9 hrs

∴ Average speed

= $\frac{48}{9}$ = $5\frac{1}{3}$ km/h

125. (c)



Avg. speed = $\frac{\text{Total distance}}{\text{Total time}}$

= $\frac{60\times3}{\frac{60}{10}+\frac{60}{20}+\frac{60}{60}} = \frac{180\text{ km}}{(6+3+1)\text{ hour}}$

⇒ Average speed = 18 km/hr

short trick:

Avg. speed = $\frac{3xyz}{xy+yz+zx}$

126. (c) Avg. Speed = $\frac{2\times60\times45}{60+45}$

= $\frac{1080}{21}$ km/hr

Time = $5+\frac{1}{4}$ hr = $\frac{21}{4}$hr

Distance travelled

= $\frac{1080}{21}\times\frac{21}{4}$ = 270 km

127. (c)

	A	:	B
Ratio of speed =	3	:	4
Ratio of time =	4	:	3

4 unit – 3 unit = 1unit = 30 min

So, 4 units = 30 × 4 = 120 min

Required time = 2 hrs

128. (c)

	A	:	B
Ratio of speed =	4	:	5
Ratio of time =	5	:	4

(5 – 4)unit = 15 min

1 unit = 15 min

So, Time taken by B = 4 × 15 = 1hr

Distance = S × T = 50 × 1= 50 km

129. (b) Given:-

A's speed = 9 km/hr

B's speed = 10 km/hr

	A	:	B
Ratio of speed =	9	:	10
Ratio of time =	10	:	9

[Speed ∝ $\frac{1}{\text{time}}$]

1 hour more

Here we find A takes 60 min more than that of B.

But actual more time = 36 min.

i.e. 60 units = 36

1 unit = $\frac{36}{60} = \frac{3}{5}$

Their travelled distance is same

Distance = Time × Speed

= 9 × 10

= 90 units

Actual distance, covered by them = 90 × $\frac{3}{5}$ = 54 km.

130. (b) Let his usual speed = $4x$

Let the speed be $3x$

	usual	:	late	
Their Ratio of Speed=	4	:	3	$\left[\text{time} \propto \frac{1}{\text{speed}}\right]$
Their Ratio of time =	3	:	4	

1 minute late

Here we find, He lates by 1 minute but actual time

= 120 minutes

i.e. 1 unit = 20 minutes

Therefore,

The usual time taken by him to reach his office

= 3 × 20

Usual time = 60 minutes.

Alternate

usual time =

$$\left\{\frac{\text{late speed}}{(\text{usual speed} - \text{late speed})} \times \text{late time}\right\}$$

$\Rightarrow$ usual time = $\frac{3}{(4-3)} \times 20$

$\Rightarrow$ **60 minutes**

131. (c)

speed	4	3
time	3	4
1 unit	→ ½	
4 units	→ 2hr	

$\Rightarrow$ distance = s × t = 3 × 2 = 6km

132. (c) Let the speed of A = 6 km/hr.

Speed of B = $6 \times \frac{5}{6}$ =5 km/hr

	A	B
Speed	6	5
Time	5	6
	1 → 1hr. 15 min.	

1 unit → 1 $\frac{1}{4}$ hr

6 units → 7 $\frac{1}{2}$ hr

B reached the destination in 7 hours 30 minutes.

133. (a)

	Actual	:	Reduced
Ratio of speed =	3	:	2
Ratio of time =	2	:	3

1 unit = 1 hr

$\therefore$ Actual time taken = 2 units

= 2 × 1 = 2 hrs

134. (c)

	Actual	:	Reduced
Ratio of speed =	11	:	7
Ratio of time =	7	:	11

Given; 11unit = 22 hours

unit = 2 hours

Actual time i.e 7 unit = 14 hrs.

So, time saved = 22 – 14 = 8 hrs.

135. (b)

Usual speed		New speed
7	:	5
×5 ↓		×5 ↓
35 km/h	:	25 km/h

$\because$ Train covers 42 kms in 1 hour, 40 min, 48 second with the speed of $\frac{5}{7}$ of its usual speed.

Then its new speed

$= \frac{\text{Distance}}{\text{Time}} = \frac{42 \text{ km}}{\frac{504}{300} h}$

$\left\{\begin{array}{l} 1 \text{ hour } 40 \text{ min } 48 \text{ second} \\ 1 \text{ h} + 40 \text{ min.} + \frac{48}{60} \text{ min} \\ 1 \text{ h} + \left(40 + \frac{4}{5}\right) \text{min} \\ 1 \text{ h} + \frac{204}{5} \text{min} \\ \left(1 + \frac{204}{5 \times 60}\right) \text{h} = \frac{504}{300} \text{h} \end{array}\right\}$

$= \frac{42}{504} \times 300$ km/h

= 25 km/h

$\because$ 5 units = 25 km/hr

1 unit = 5 km/h

$\because$ Usual speed = 7 units

$\therefore$ Usual speed = 7 × 5 = 35 km/hr

136. (b) The two cars will collide if their speed are in the ratio of the distance to be covered by them

Ratio of distance

= 40 : 50 = 4 : 5

For the cars not to collide

$v_1 : v_2 \neq 4 : 5$

137. (d) Let the total Journey be

$\frac{3}{8}, \frac{5}{6}$

LCM = 24 km

At 11:00 am, man covers $\frac{3}{8}$ of the whole journey i.e

$= 24 \times \frac{3}{8}$ = 9 km

At 4:30 pm, man covers $\frac{5}{6}$ of the whole journey i.e.

= 24 × $\frac{5}{6}$ = 20 km.

i.e. man covers

(20 – 9) = 11 km in (4;30 pm – 11:00 am)

= $5\frac{1}{2}$ hours

So the speed of the man

$= \frac{11 \text{ km}}{5\frac{1}{2} \text{ km/h}} = 2$ km/h

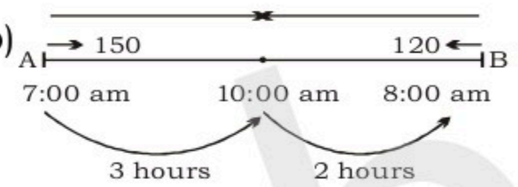
or, taken by the man to cover

9 km = $\frac{9}{2} = 4\frac{1}{2}$ hours

then the starting time of the journey is

= 11:00 am – $4\frac{1}{2}$ hours = **6 : 30 am**

138. (b)



Distance covered by A in 3 hours with the speed of 50 km/h

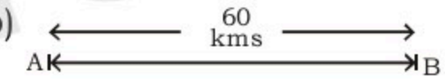
= 50 × 3 = 150 km.

Distance covered by B in 2 hours with the speed of 60 km/h

= 60 × 2 = 120 km.

then AC : BC = 150 : 120 = **5 : 4**

139. (b)



$\because$ They meet after 6 hours if they walk towards each other i.e. their speed will be added.

So their relative speed in opposite direction

$= \frac{\text{distance}}{\text{time}} = \frac{60}{6}$

Relative speed in opposite direction ($\rightleftharpoons$) = 10 km/h .....(i)

According to the question:-

$\Rightarrow \frac{2}{3}A + 2B = \frac{60}{5}$

$\Rightarrow \frac{2}{3}A + 2B = 12$

$\Rightarrow A + 3B = 18$

$\Rightarrow$ B's speed = $\frac{18 - A}{3}$

$\Rightarrow A + B = 10$

$\Rightarrow A + \frac{18 - A}{3} = 10$

$\Rightarrow 3A + 18 - A = 30$

$\Rightarrow 2A = 12$

$\Rightarrow$ A's speed = 6 km/h

140. (a) In these type of questions go through options to save your valuable time

option (a)

Abhay's speed = 5km/hr

Abhay's time = $\frac{30}{5}$ = 6 hr

Sameer's time = 6 –2 = 4 hr

Abhay's new time = $\frac{30}{5\times2}$ = 3 hr

Hence option (a) is correct as it satisfies all the conditions.

141. (d) Distance travelled by driver in 2 hours

= 300 × $\frac{40}{100}$ = 120 km

Distance to be covered in 2 hours = 300 – 120 = 180 km

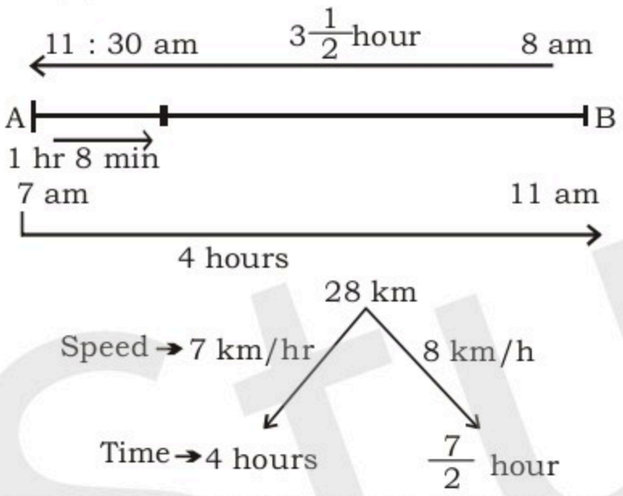
Required speed = $\frac{180}{2}$ = 90 km/h

Required difference

= 90 – $\frac{120}{2}$ = 30 km/hr.

So increase speed = 30 km/hr

142. (d)



Distance covered by train started from point A before 8 am with 7 km/hr

⇒ Distance = 7 × 1 = 7 km

Remaining distance = 28 – 7 = 21 km

⇒ After 8 am

Their relative speed in oppo. direction = (7 + 8) km/hr = 15 kmph

Time taken to cover 21 km

= $\frac{21}{15}$ = $\frac{7}{5}$ = $1\frac{2}{5}$

= 1 hour + $\frac{2}{5}$ × 60 min

= 1 hour + 24 min

Therefore they will cross each other at

= 8 am + 1 hour + 24 min

= 9 : 24 am

143. (d) Distance = $\frac{S_1S_2}{S_1-S_2}\times t$

from both conditions,

$\frac{S(S+3)}{3}\times40 = \frac{S(S-2)}{2}\times40$

2S + 6 = 3S – 6

S = 12 km/hr

from condition 1st

$\frac{12\times15}{3}\times\frac{40}{60}$ = 40 km

144. (c) $S_{avg.} = \frac{2ab}{a+b} = \frac{2\times25\times4}{25+4}$

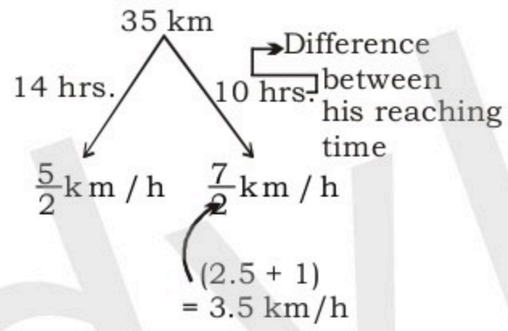
= $\frac{200}{29}$ km/hr

Now, 2D = $\frac{200}{29}\times\left(5+\frac{4}{5}\right)$

= $\frac{200}{29}\times\frac{29}{5}$ = 40 km

⇒ D = 20 km

145. (b)



Difference between his reaching time.

= (14 – 10)hrs = 4 hrs

= 4 hrs → 6m + 6m (late + before)

= 4 hrs → 12 minutes

= 1 unit = $\frac{12}{4\times60}$ km

{∵ 1m = 60 second} = 1 unit

= $\frac{1}{20}$ km

then 35 units

= $35\times\frac{1}{20}$ km = $\frac{7}{4}$ km

Then the distance between his house and school is = $\frac{7}{4}$ km

Alternate

Here, s_1 = First speed

s_2 = speed after increment

t_1 = late time

t_2 = before time

Distance = $\frac{s_1\ s_2}{s_2-s_1}\times\frac{t_1+t_2}{60}$

= $\frac{\frac{5}{2}\times\frac{7}{2}}{\frac{7}{2}-\frac{5}{2}}\times\frac{(\overset{\text{late}}{\uparrow}6 + \overset{\text{before}}{\uparrow}6)}{60}$ hr.

= $\frac{\frac{35}{4}\times\frac{12}{60}}{1}$ = $\frac{7}{4}$ km

146. (d) Let the height of the hill = x km

∵ The distance will be same man either ascend and descend

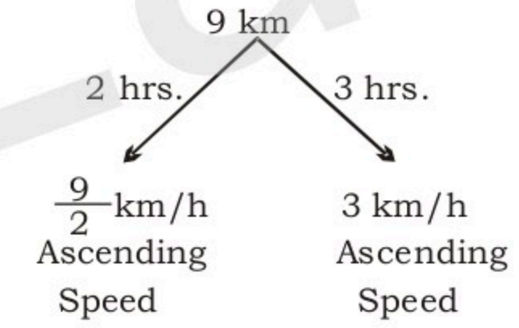
$\frac{x\text{ km}}{\frac{9}{2}\text{ km/h}} + \frac{x}{3\text{ km/hr}}$ = 5 hrs

$\left\{\begin{array}{l}\because\ \text{time} = \frac{\text{Distance}}{\text{speed}}\\ \text{Total time = Ascending time + descending time}\end{array}\right\}$

= $\frac{2x}{9}+\frac{x}{3}$ = 5 = $\frac{2x+3x}{9}$ = 5

= 5x = 5 × 9 = x = 9 km

Alternate



total time = 2 + 3 = 5 hrs.

Here, 5 units = 5 hrs (actual time)

∵ 1 unit = 1

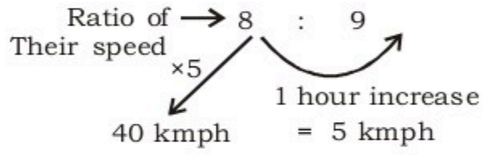
∴ Ascending length = 9 km.

147. (b) According to the question

⇒ Ratio of its time ⇒ $\frac{9}{2}$ hour : 4 hour

⇒ 9 : 8

⇒



Here, we find that speed of the car is increased by 1 km/hr but Actual increment is 5 km/hr.

i.e, 1 unit = 5 kmph

8 units = 8 × 5 = 40 kmph.

⇒ Therefore slower speed of car = 40 kmph

Alternate

Let total distance = d km.

According to the question,

$$\frac{d}{4} - \frac{d}{4\frac{1}{2}} = 5$$

$$\Rightarrow \frac{d}{4} - \frac{2d}{9} = 5$$

$$\Rightarrow 9d - 8d = 36 \times 5$$

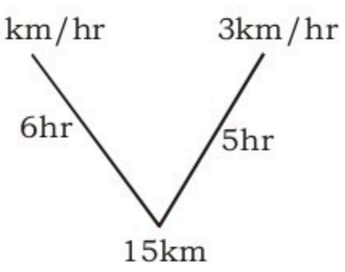
$$\Rightarrow \text{distance} = 180 \text{ km}$$

Therefore slower speed is

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

$$= \frac{180}{\frac{9}{2}}$$ Slower speed = **40 kmph**

148. (b)



$$= 6 - 5 = 1 \text{ unit} \rightarrow \frac{16}{60}$$

$$15 \text{ units} \rightarrow \frac{16}{60} \times 15 = 4$$

$\therefore$ Required distance = 4 km

149. (c)

	usual	:	late	
Their Ratio of speed	40	:	35	$\left[\text{time} \propto \frac{1}{\text{speed}}\right]$
	8	:	7	
Their Ratio of time	7	:	8	

1 hour late

1 unit $\rightarrow \frac{15}{60}$ hour $= \frac{1}{4}$ hour

8 units $= 8 \times \frac{1}{4} = 2$ hr.

Total distance = 35 × 2 = 70 km.

Alternate

$\Rightarrow$ Let the total distance = d km

According to the question,

$$\Rightarrow \frac{d}{35} - \frac{d}{40} = \frac{15}{60}$$

$$\Rightarrow 40d - 35d = \frac{15 \times 40 \times 35}{60}$$

$$\Rightarrow 5d = 350$$

$\Rightarrow$ Distance = 70 km.

150. (b) In such type of questions follow the below given method.

S	T	d =(s × t)
+10	–1	→ 10
+20	–7/4	→ 35

$-s + 10t = 10$ .....(i)

$-\frac{7}{4}s + 20t = 35$ .....(ii)

On solving equation (i) and (ii) we get,

S = 60 km/hr and T = 7 hours

Total distance = 60 × 7 = 420 km

151. (a) Let the speed = x km/hr and, time = y hr.

A.T.Q

$x \times y = (x + 3)(y - 1)$

$xy = xy + 3y - x - 3$

$x - 3y = -3$..... (i)

also, $x \times y = (x - 2)(y + 1)$

$xy = xy - 2y + x - 2$

$x - 2y = 2$..... (ii)

Solve equation (i) and (ii)

$x = 12$, $y = 5$

Distance = Speed × time

= 12 × 5 = 60 km

152. (c) Distance between the fort and the man

= 330×10 = 3300 m

= 3.3 km

153. (c)

$\because$ The second train has travelled 120 km more than the first train only because the speed of the second train is 10 km/h. more than the first train and their starting time is same.

Time taken by the second train to cover 120 kms with the surplus speed of 10 km/h

$$= \frac{120}{10} = 12 \text{ hrs.}$$

i.e. time, taken by the both train before meeting point in opposite direction

= 12 hrs.

Their relative speed in oppo. direction

= (50 + 60) km/h

= 110 km/hr

Total distance covered by them

= 12 × 110 = 1320 km.

So the distance between A and B = 1320 km

Alternate:

Time taken by trains before meeting point

$$= \frac{120 \text{ km}}{(60 - 50) \text{ km/h}} = 12 \text{ h}$$

Distance b/w A and B = (60 + 50) × 12 = 1320 km.

154. (d) Time taken to ride one way

$$= \frac{3}{2} = 1.5 \text{ hrs.}$$

Time taken to walk one way

= 4.5 – 1.5 = 3 hrs.

Time taken to walk both way

= 3 × 2 = 6 hrs.

155. (b) $\frac{\text{Speed of A}}{\text{Speed of B}} = \sqrt{\frac{\text{Time of B}}{\text{Time of A}}}$

$$= \sqrt{\frac{9}{4}} = \frac{3}{2}$$

$\Rightarrow$ Speed of A : Speed of B = 3 : 2

As speed is inversely proportional to time.

156. (c) Let the speed of Ravi = x km/h

Then Ajay's speed will be = $(x + 4)$ km/h

Total distance, covered by Ajay = 60 + 12 = 72 km.

Total distance, covered by Ravi = 60 -12 = 48 km.

According to the question,

They run at same time.

$$\Rightarrow \frac{72}{(x+4)} = \frac{48}{x}$$

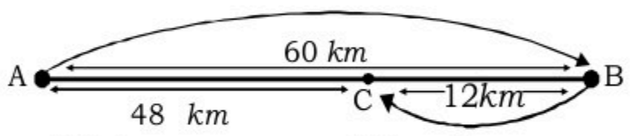
$$\Rightarrow 72x = 48x + 192$$

$$\Rightarrow 24x = 192$$

$$\Rightarrow x = 8 \text{ km/h}$$

Therefore, Ravi's speed = **8 km/h**

Alternate



Distance covered by Ajay

= AB + BC = 72

Distance covered by Ravi

= AC = 12

Ajay		**Ravi**	
72	:	48	[Here time is same so, Ratio of Distance = Ratio of Speed]
3	:	2	

Difference = 1

1 unit = 4 km/hr

Speed of Ravi = 2×4

= 8 km/hr

157. (b)

	Train	Car	
	60 km	240 km	4 hr
+40			+10min
	100 km	200 km	4 hr/ 10min
+200			+10×5 = 50min
	300 km	0 km	5 hr

$\Rightarrow$ Speed of the train = $\frac{300}{5}$

= 60 km/hr

158. (a) Let the time taken by A to cover 1km = x sec.
time taken by B and C to cover the same distance = x + 25 and x + 55 sec

	A	C
Distance	1000	725
Time	29	40

$\frac{A}{C} = \frac{29}{40} = \frac{x}{x+55} \Rightarrow 29x + 1595 = 40x$

$\Rightarrow x = \frac{1595}{11} = 145$

time taken by A = 145 sec.
= 2 minutes 25 sec.

159. (b)

A	B	C
1000m	950m	931m

in 950 m race B can give C a start of
950 – 931 = 19 m
950 units $\rightarrow$ 19 m

1unit $\rightarrow \frac{19}{950}$

1000 units $\rightarrow$ 20m.

160. (b) Let the time taken by A to cover 1 km. = x sec.
Time taken by B and C = x + 30 and x + 45 sec

	A	B
Distance	1000	820
Time	41	50

$\frac{x}{x+45} = \frac{41}{50}$

$50x = 41x + 1845$

x = 205 sec.

161. (b) Ratio of speeds of A and B = 5 : 4
When A runs 500 m. B runs 400 m.
A will pass B every time when the distance between them is 400 m.

A will cover $\frac{400}{(500-400)} \times 500$

= 2000m.
to overtake B each time

Number of time = $\frac{5000}{2000}$ =2.5 $\approx$ 2

times (because .5 time is not possible)

162. (a)

A	B	C
1000	900	
400	360	

Now,

A	B	C
100	90	81

$\Rightarrow$ A defeats C by 19 metres in a race of 100 metres

$\Rightarrow$ In a race of 100 × 5 = 500 m A defeats C by 19 × 5 = 95 m

163. (c)

A	B	C
190	200	
180	200	

A	B	C
171	180	200

$\Rightarrow$ C an give a start of 200 – 171 = 29 metres to A

164. (b) Let the time taken by A to run 1000 meters
= x seconds
time taken by B to run 900 metres
= x + 20 sec.
Speeds of A and B

= $\frac{1000}{x}, \frac{900}{x+20}$ respectively

ATQ,

$\frac{950}{\frac{1000}{x}} - \frac{1000}{\frac{900}{x+20}} = 25$

(As B is the winner now)

$\Rightarrow \frac{950x}{1000} - \frac{1000(x+20)}{900} = 25$

$\Rightarrow \frac{19x}{20} - \frac{10x+200}{9} = 25$

$\Rightarrow 171x - 200x - 4000$
$= 25 \times 20 \times 9$

$\Rightarrow 29x = 500$

$\Rightarrow x = \frac{500}{29}$ sec.

165. (c)

A	B	C
1000	960	930

$\Rightarrow$ B can give C a start of 30 metres in a 960 metres race

$\Rightarrow$ 960 units $\rightarrow$ 30

1 unit $\rightarrow \frac{1}{32}$

1000 units $\rightarrow \frac{1000}{32}$

$= 31\frac{1}{4}$ metres.

166. (c) Time taken by kamal

$= \frac{100}{18 \times \frac{5}{18}} = 20$ seconds

Time taken by Bimal
= 20 + 5
= 25 seconds

speed of bimal $= \frac{100}{25} \times \frac{18}{5}$

= 14.4 km/h

167. (a) Speed of A,B, and C = $\frac{1000}{5}$,

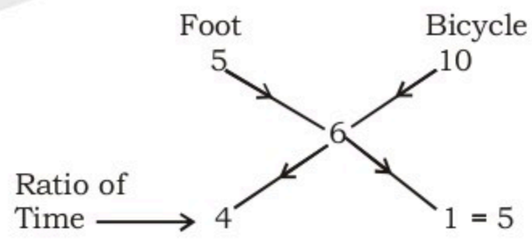
$\frac{1000}{8}, \frac{1000}{10}$ = 200 m/min., 125 m/min., 100 m/min.

Distance travelled by B and C beofre A starts
= 125, 200 metres
Time taken by A to meet B and C

$= \frac{125}{200-125}, \frac{200}{200-100}$

$= \frac{5}{3}$ min., 2 min

168. (b) According to the question.



5 units $\rightarrow$ 12 hr

1 unit $\rightarrow \frac{12}{5}$ hr

and, 4 units $\frac{12}{5} \times 4 = \frac{48}{5}$

Distance travelled on foot

$= \frac{48}{5} \times 5 = 48$km

169. (c) Speed of train = $\frac{450+150}{20}$

= 30 m/s

Speed (in km/hr) = $30 \times \frac{18}{5}$

= 108 km/hr

170. (b) Total Journey = 400

$\frac{3}{4}$ Journey $= 400 \times \frac{3}{4}$

$= 300$ km

Remaining Journey = 100 km

Let the speed of car for the rest of Journey = x km/hr

A.T.Q.

$$\frac{300}{30} + \frac{100}{x} = 12\frac{1}{2}$$

$$10 + \frac{100}{x} = \frac{25}{2}$$

$$\frac{100}{x} = \frac{25-20}{2}$$

$$x = \frac{100 \times 2}{5}$$

$x = 40$ km/hr

171. (b) According to the question.

Let the speed of faster car = x km/h

the speed of the slower car = y km/h.

$$\text{Speed} = \frac{\text{Distance}}{\text{time}}$$

$x+y = \frac{100}{1}$ km/hr and $x-y = \frac{100}{5}$

= 20km/hr

$x+y = 100$ .....(i)

$x-y = 20$ .....(ii)

Solve equation (i) and (ii)

we get

$x = 60$km/hr

y = 40 km/hr

Speed of faster car = 60km/hr.

172. (c) Distance = 20 × 3 = 60 km

when 1 hour late then reduced time = 3 – 1 = 2 hr

Then increased speed

$= \frac{60}{2} = 30$ km/hr

173. (b) Let the speed of 1st train = Am/s.

Let the speed of IInd train = B m/s.

then, $\frac{320}{9} = A + B$ .....(i)

$\frac{360}{27} = A$

$A = \frac{40}{3}$

Put value of A in (i), we get

$B = \frac{200}{9}$.

then, $\frac{A}{B} = \frac{40 \times 9}{3 \times 200} = \frac{3}{5}$

174. (a) First speed = 8

Second Speed = 12 km/hr.

Starting time will be same in both conditions

Distance travelled by first speed in 2 hours

Time taken by second speed to travel distance 16 km

$$\text{Time} = \frac{\text{Distance}}{\text{IInd Speed} - \text{Ist Speed}}$$

$= \frac{16}{12-8} = 4$ hrs.

Total time taken by second speed = 4 hrs.

Total Distance = 4×12 = 48 km.

Starting time to travel at second speed

= 9 am – 4 hrs. = 5 am

Total time taken by third speed to reach the office

= 10am – 5am = 5 hrs.

$$\text{IIIrd Speed} = \frac{\text{Total Disance}}{\text{Time}}$$

$= \frac{48}{5} = 9.6$ km/hrs.

175. (d) $r = \frac{\text{diameter}}{2} = \frac{140}{2} = 70$ cm

Distance of one Revolutions

$= 2\pi r = 2 \times \frac{22}{7} \times 70 = 440$ cm

No. of Revolutions In one hour

$= \frac{22\text{km}}{440\text{cm}}$ (1 km = 1,00,000 cm)

No. of Revolutions In 30 hours

$= \frac{22 \times 100000 \times 30}{440}$

$= 1\frac{1}{2}$ Lakh.

176. (b) L.C.M of 40, 50, 60 and 30

= 600 minutes

= 10 hrs

So they meet again 10 hours after they start

i.e. 7 : 00 PM

177. (d) Let the man travels 1 unit distance

so, remaining distance

$= 1 - \left(\frac{1}{6} + \frac{3}{4}\right) = 1 - \frac{22}{24} = \frac{1}{12}$ unit

$\because \frac{1}{12}$ unit = 2km

so, 1 unit = 24 km

178. (d) Avg speed $= \frac{2xy}{x+y} = \frac{2 \times 16 \times y}{16+y}$

$6.4 = \frac{32y}{16+y}$

$102.4 + 6.4\,y = 32\,y$

$102.4 = 25.6y$

$y = \frac{102.4}{25.6} = 4$ km/hr

179. (a) Distance covered in 1st 2hr.

= 2 × 20 = 40 km

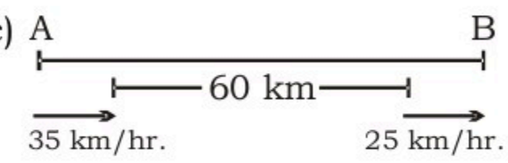
Time taken to cover 60 km

distance $= \frac{60}{10} = 6$ hr.

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

$= \frac{100}{2+6} = \frac{100}{8} = 12\frac{1}{2}$ km/hr

180. (c)



relative speed for same direction = (35–25) km/hr = 10 km/hr

time taken when they meet

$= \frac{60}{10} = 6$ hour.

181. (c) 54 km/h = $54 \times \frac{5}{18}$

= 15 m/sec.

Total distance = 200 + 175

= 375 m

$\therefore t = \frac{d}{s} = \frac{375}{15} = 25$ sec.

182. (a) S = 72 km/h

$= 72 \times \frac{5}{18} = 20$ m/sec

D = 160 m

$t = \frac{D}{S} = \frac{160}{20} = 8$sec.

183. (d) Distance = 1.7 km
time=25 sec

$\therefore$ speed = $\frac{\text{Distance}}{\text{time}} = \frac{1.7\times1000}{25}$

= 68 m/s

184. (d) Let length of train be x and speed be 'S'

$S = \frac{x+50}{14}$, also, $S = \frac{x}{10}$

then,

$\frac{x+50}{14} = \frac{x}{10}$

$5x + 250 = 7x$

$x = 125$

Speed = $\frac{125}{10}$ m/s

$= \frac{125}{10} \times \frac{18}{5} = 45$ km/hr

185. (c) Average speed = $\frac{2xy}{x+y}$

x = 10 km/h
y = 12 km/h

Average speed = $\frac{2\times10\times12}{(10+12)}$

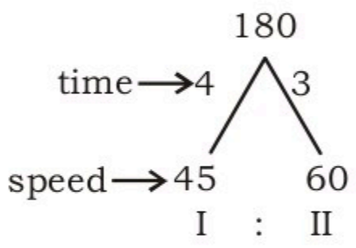
$\therefore$ Average speed = 10.9 km/hr

186. (a) Avg speed = $\frac{\text{Total distance}}{\text{total time}}$

$= \frac{50+40+90}{2+2+6}$

$= \frac{180}{10} = 18$ km/hr

187. (c) Let distance = 180 unit



time difference = 4 – 3 = 1

$\because$ 1 unit = $5\frac{1}{2}$

so total distance = 180 units

$= 180 \times 5\frac{1}{2} = 990$ km

188. (b) Let the speed of car is x km/hr
Now,
According to the question,

$(x-4) \times \frac{3}{60} = \frac{130}{1000}$

$(x-4) \times \frac{1}{20} = \frac{130}{1000}$

$(x-4)\frac{1}{20} = \frac{13}{100}$

$x - 4 = \frac{13}{5}$

$x = \frac{13}{5} + 4$

$x = \frac{33}{5} = 6.6$ km/hr.

189. (c) D = S × t = 80 × 7

$\Rightarrow \boxed{D = 560km}$

190. (c) Total distance = 60 × 15 = 900
speed when this distance to be covered in 12 hr

$= \frac{900}{12} = 75$ km/hr

191. (c) Total distance = 42 × 10
= 420km
New given time = 7 hr
and, required new speed

$= \frac{420}{7} = 60$km/h

$\therefore$ Required increase in speed
= 60 – 42 = 18 km/hr

192. (a)

Train	Car
240	210 = 8 h 40 min.
180	270 = 9 h

To travel extra 60 km by car increase in time = 20 min
So, travel extra 240 km by car increase in time = 80 min
$\therefore$ 450 km by car in = 8 h 40 min + 80 min = 10 h

Speed of car = $\frac{450}{10}$ = 45km/h

193. (b) Let speed of c = x km/h
total distance = 150 + 250 = 400 m = 0.4 km

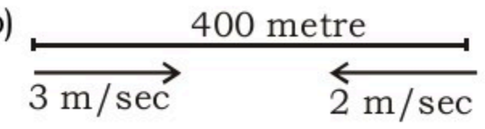
time = 2 min = $\frac{1}{30}$ h

Hence, relative speed
= (100 – x) km/h

Now $0.4 = (100 - x)\times\frac{1}{30}$

12 = 100 – x
x = 88 km/h

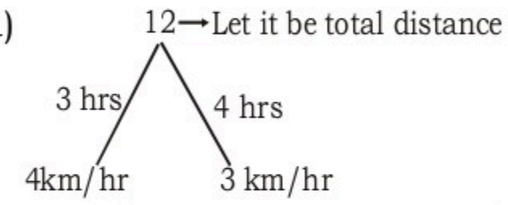
194. (b)



Relative speed = (3 + 2) m/sec

time taken = $\frac{400}{5}$ sec = 80 sec.

195. (a)



Time difference = (4 – 3) = 1 hr
But, According to the question,

60 × $\frac{1}{6}$ = 10 minute

So, distance = 12 × $\frac{1}{6}$ = 2 km

196. (d) Let the distance be x km.
According to the question,

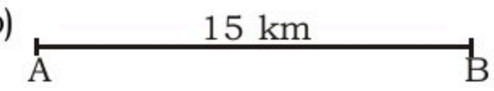
$\frac{x}{12} + \frac{x}{9} = 2 + \frac{20}{60}$

$\frac{3x+4x}{36} = \frac{7}{3}$

$\frac{7x}{36} = \frac{7}{3}$

$\boxed{x = 12km}$

197. (b)



Let the speed of A be x km/hr and speed of B be y km/hr
So, According to the question,

$\frac{15}{x+y} = \frac{1}{2}$

x + y = 30 .... (i)
and

$\frac{15}{x-y} = \frac{5}{2}$

5x – 5y = 30 ..... (ii)
multiply equation (i) by 5 and add

5x + 5y = 150
5x – 5y = 30
10x = 180

$\boxed{x = 18\,km/hr}$

and y = 30 – x
= 30 – 18 = 12 km/hr.

198. (b) Total distance covered by man in 3 hours 36 min is

$= 5 \times 3\frac{36}{60} = 5 \times 3\frac{3}{5}$

$= 5 \times \frac{18}{5} = 18\text{km}$

18 km is covered at an speed of 24 km/hr

$\therefore$ time taken is $= \frac{18}{24}$

$= \frac{3}{4} \times 60 = 45$ min

199. (c) Let the original speed of Aeroplane be x km/hr

$$\frac{1200}{(x-300)} - \frac{1200}{x} = 2$$

$$\frac{x - x + 300}{(x-300)x} = \frac{2}{1200}$$

$x\ (x-300) = 600 \times 300$

$x = 600$ km/h

original time

$t = \frac{1200}{600} = 2$ hours

200. (b) Let A finish the race of : x m

B finish the race of : x–12

C finish the race of : x–18 ..(i)

In another race of B & C

B finish race of : x.

C finish race of : $x - 8$.....(ii)

Ratio of speeds of B & C

$$\frac{x-12}{x-18} = \frac{x}{x-8}$$

$(x - 12)\ (x - 8) = x(x - 18)$

$x^2 - 20x + 96 = x^2 - 18x$

$96 = 2x$

$x = 48$ m

201. (b) Let side of the square playground is x.

and, Area $= x^2 = 1127.6164$

$x = \sqrt{1127.6164}$

$x = 33.58$

Perimeter of playground $= 4x$

$= 4 \times 33.58 = 134.32$

time taken to complete 1 round

$$= \frac{134.32}{2\frac{9}{20}}$$

$$= \frac{134.32}{49} \times 20$$

$= 54.82$ min.