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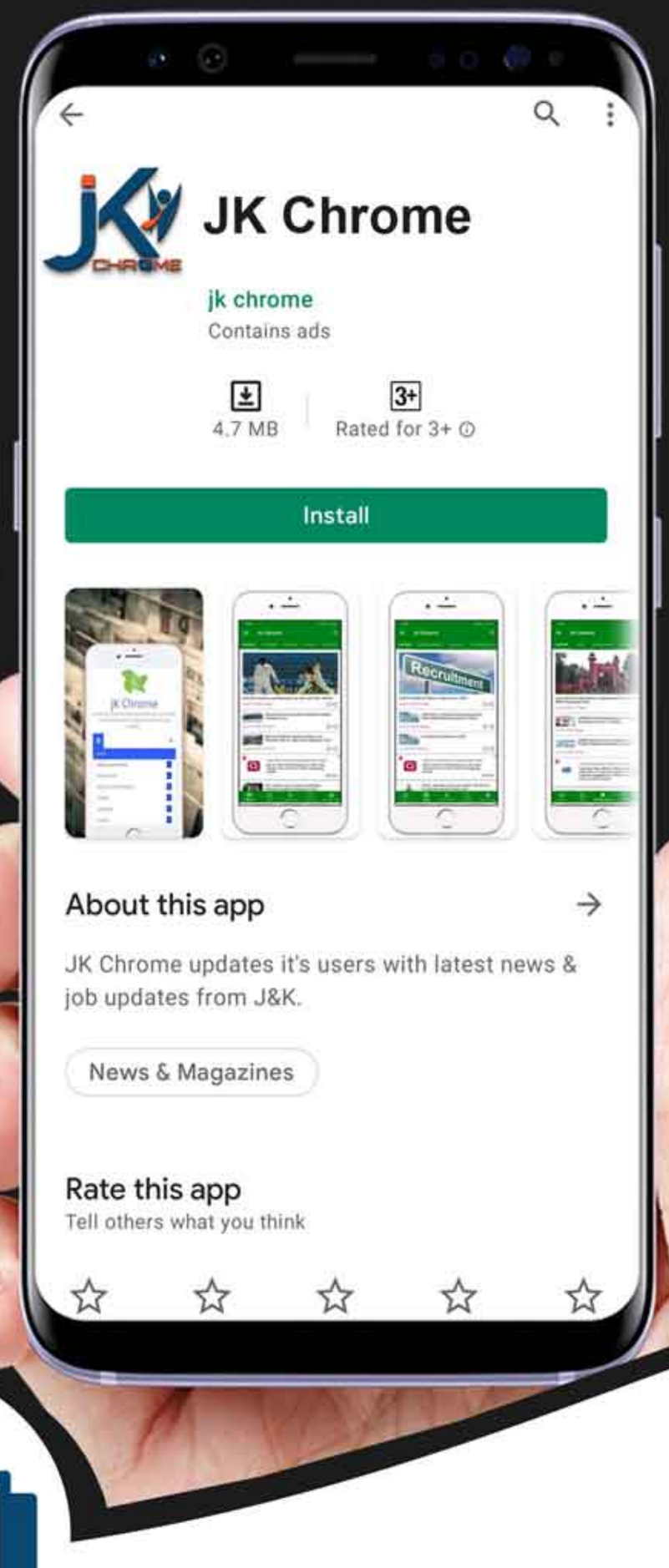

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Time, Speed and Distance

RELATIONSHIP BETWEEN TIME, SPEED, AND DISTANCE

As we know, distance = speed × time

D = S × T

It means that if a person is running at a speed of 20 km/h and he runs for 2 h, he will be covering a total distance of 40 km. That is, distance = 20 × 2 = 40 km

Conversion from m/s to km/h and Vice Versa

If speed is given in m/s and it is required to convert it into km/h, then we multiply it by 18/5, and when speed is given in km/h and we have to convert it into m/s, then we multiply it by 5/18

36 km/h = $36 \times \frac{5}{18} = 10$ m/s

20 m/s = $20 \times \frac{18}{5} = 72$ km/h

Different cases

By using the basic relationship between time, speed, and distance, the following three different cases are possible:

Case I When S (distance) is constant $V \alpha \frac{1}{T}$

So, $V_1/V_2 = T_2/T_1$ (Direct)

Case II When T (time) is constant $S \alpha V$

So, $S_1/S_2 = V_1/V_2$

Case III When S (speed) is constant $T \alpha D$

So, $T_1/T_2 = D_1/D_2$

Approaches

Using STD table

Advantages of tabular form

Table helps to organize complex information given in the question.

It increase speed and accuracy while solving TSD questions

Further, We can apply tabular form in all types of questions like trains, boats etc.

Speed (S)	Time (T)	Distance(D)
D/T	D/S	S×T
÷	÷	×

Peter covers a distance in 1 hour 24 minutes. He covers two thirds of this distance with a speed of 4 km/h distance and rest of the distance at a speed of 5 km/h . Find Total distance

S	T = 7/5	D
4	?	2x/3
5	?	x/3

S	T = 7/5	D
4	2x/12	2x/3
5	x/15	x/3

$$\frac{2x}{12} + \frac{x}{15} = \frac{7}{5}$$

on simplification x = 6 km

PRODUCT CONSTANCY METHOD

Application of % to STD

Speed × Time = Distance

Imagine above variables in following format

S × T = D

1 × 1 = 1

↑ × ↓ = 1

Example

Time, Speed, and Distance (TSD) When speed of a car is increased by 25%, time taken reduces by 20 minutes in covering a certain distance. What is the actual time taken to cover the same distance by actual speed?

Solution

Normal Method

Since we know S = V × T (Distance = Speed × Time) New speed = 1.25 V, so new time = T/1.25 So, reduction in time = T−T/1.25 = 0.25 T/1.25 = T/5

T/5 = 20 min ⇒ T = 100 min

Fraction Method

$$\text{if } (S\uparrow)25\% \rightarrow \frac{1}{4} \rightarrow \frac{5}{4} \text{ then } (T\downarrow) \rightarrow \frac{4}{5} \rightarrow \frac{1(\downarrow) \rightarrow 20 \text{ Min}}{5 \rightarrow 100 \text{ Min}}$$

Product Constancy Method

Since speed has been increased by 25%, so time will reduce by 20%. Now, 20% T(Time) = 20 min So, Total time = 100 min

Example

TSD Mayank goes to his office from his home at a speed of 20 kmph and gets late by 10 min. However, when he increases his speed to 25 kmph, he is 20 min early. What is the distance from his office to his home?

Normal Method

Let us assume that distance = D

So, D/20 − D/25 = 30/60 h = 1/2 So, D = 50 km

Fraction Method

Speed (S↑) = 20↑25 → 25%↑

Time (T↓) = 10 min late + 20 min early = 30 minutes

$$\text{if } (S\uparrow)25\% \rightarrow \frac{1}{4} \rightarrow \frac{5}{4} \text{ then } (T\downarrow) \rightarrow \frac{4}{5} \rightarrow \frac{1(\downarrow) \rightarrow 30 \text{ Min}}{5 \rightarrow 150 \text{ Min} = 2.5 \text{Hour}}$$

So D = 20 × 2.5 = 50KM

Product Constancy Method

S = V × T → (S)25%↑ → (T)20%↓ → 30 min ⇒ T = 150 min = 2.5 hour So, total distance = 20 × 2.5 = 50 km

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TYPE

An areoplane covers a certain distance at a speed of 240 km/hour in 5 hours. To cover the same distance in 5/3 hours it must travel at a speed of :

Solution:

(d) Distance = Constant
So, Speed $\propto$ 1/Time
Ratio of time = 5 : 5/3
Ratio of time = 3 : 1
Ratio of speed = 1 : 3
1 unit → 240 km/hr
3 units → 240 × 3
= 720 km/hr

TYPE

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?

Solution:

(c) Time taken at 5 km/hr = 20/5
= 4 hr.
Actual time = (4 – 2/3) = 10/3 hrs.
Time taken at 8 km/hr = 20/8
= 5/2 hrs
Time difference = 10/3 – 5/2 = 5/6 hrs.
= 50 min. required time.

TYPE

A train passes a 50 meters long platform in 14 seconds and a man standing on the platform in 10 seconds. The speed of the train is:

Solution:

(d) Distance travelled in 14 sec. = 50 + l
Distance travelled in 10 sec.
= l
So, Speed of train = 50/(14 - 10) m/sec.
= 50/4 × 18/5 km/hr = 45 km/hr

TYPE

A man can reach a certain place in 30 hours. If he reduces his speed by 1/15th, he goes 10 km less in that time. Find his speed per hour.

Solution:

(d) Actual : Reduced
Ratio of speed = 15 : 14
Ratio of time = 14 : 15
14 → 28 hrs
15 → 30 hrs
So, in 2 hrs it travels 10 kms
Speed = 10/2 = 5 km/hr

TYPE

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

Solution:

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

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

Where S_1, S_2, and T_1, T_2 Are the respective speeds and times of the objects.

$= 45/S_2 = \sqrt{\frac{\frac{10}{3}}{\frac{24}{5}}}$

$= S_2 = 45 \times 6/5 = 54$ km/hr
Required speed = 24 km/hr

TYPE

A train 270 meters long is running at a speed of 36 km/hr. then it will cross a bridge of length 180 meters in

Solution:

(b) According to question (174)

Crossing time $= \sqrt{\frac{l1+l2}{Speed}}$

$\rightarrow \sqrt{\frac{270+180}{36\times5/18}} = \frac{450}{10}$ time
= 45 second

TYPE

A is twice as fast as B and B is thrice as fast as C is. The journey covered by C in 1.5 Hours will be covered by A in

Solution:

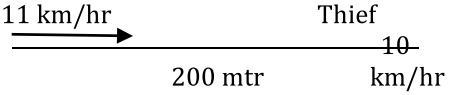
According to Question,
A : B : C
2 : 1
3 : 1
A : B : C
6 : 3 : 1 Ratio of speed
$\frac{1}{6} : \frac{1}{3} : \frac{1}{1}$ Ratio of time
$[\text{time} \propto \frac{1}{speed}]$
= 1 : 2 : 6
Time taken by A,.
= 1 ratio = 1 × 1/4 hours = 15 min

TYPE

A thief is noticed by a policeman from a distance of 200m the thief starts running and the policeman chasis him. The thief and the policeman run at the rate of 10km hr. and 11 km./hr. respectively. What is the difference between them after 6 minutes ?

Solution:

(a)



$V_{rel.}$ = 11 – 10 = 1 km/hr

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$= \frac{1+1000}{60}$ mt/min

Distance between them after 6 min.

$= 200 - \frac{1000}{60} \times 6 = 100$ mtr.

TYPE

Two trains 140 m and 160 m long run at the speed of 60 km/hr, and 40 km/hr. respectively in opposite directions on parallel tracks. The time (in seconds) which they take to cross, each other is :

Solution:

(b) $T = \frac{D}{T} = \frac{l1+l2}{S1+S2} = \frac{300}{\frac{100\times5}{18}}$

$\frac{300\times 18}{500} \rightarrow T = 54/5 = 10.88$ sec.

TYPE

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)

Solution:

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

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

and $S_1 + S_2 = 70/1 = 70$ ..... (ii)

from equation (i) and (ii)

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

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

= Required speeds are 40 km/hr and 30 km/hr

TYPE

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

Solution:

(b) Given : -

A's speed = 9 km/hr

B's speed = 10 km/hr

	A	:	B	
Ratio of speed =	9		10	[Speed $\propto \frac{1}{Time}$]
Ratio of time =	10		8	

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 = 36/60 = 3/5

→ Their travelled distance is same

→ Distance = Time × Speed

= 9 × 10

= 90 ratio

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

TYPE

Walking 6/7th of his usual speed a man is 12 minutes late. The usual time taken by him cover that distance in

Solution:

(b)	Actual	:	New
Speed	7	:	6
time	6	:	7

1 unit → 12 minutes

6 units → 72 minutes

= usual time = 1 hours 12 minutes

TYPE

Shri X goes to his office by scooter at a speed of 30 km/hr and reaches 6 minutes earlier. If he goes at a speed of 24 km/hr, he reaches 5 minutes late. The distance of his office is

Solution:

(c) 24 km/hr 30 km/hr

5 hr 4hr

120 km

$= (5 - 4) = 1$ unit $\rightarrow 1\frac{11}{60}$

120 unit → 11/60 × 120 = 22 km

Thus, Distance from house to office = 22 km

Previous year questions

1. A train is travelling at the rate of 45km/hr. How many seconds it will take to cover a distance of 4/5 km?
   (a) 36 sec. (b) 64 sec.
   (c) 90 sec. (d) 120 sec.
2. An areoplane covers a certain distance at a speed of 240 km/hour in 5 hours. To cover the same distance in 5/3 hours it must travel at a speed of :
   (a) 300 km/hr (b) 360 km/hr
   (c) 600 km/hr (d) 720 km/hr
3. A train 100m 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) 3/2 Hours
5. A man walking at the rate of 5 km/hr. crosses a bridge in 15 minutes. The length of the bridge (in meters) is:
   (a) 600 (b) 750
   (c) 1000 (d) 1250
6. A man crosses a road 250 meters wide in 75 seconds. His speed in km/hr is

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(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 meters) is :
(a) 500 (b) 600
(c) 750 (d) 900

8. A train passes a 50 meters 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. An athlete runs 200 meters race in 24 seconds, his speed in (km/hr)
(a) 20 (b)24
(c) 28.5 (d) 30

10. A car goes 10 meters in a second. Find its speed in km/hour,
(a) 40 (b) 32
(c) 48 (d) 36

11. A man riding his bicycle covers 150 meters in 25 second. What is his speed in km per hour ?
(a) 25 (b) 21.6
(c) 23 (d) 20

12. 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

13. 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

14. A 120 m long train takes 10 seconds to cross a man standing on a platform. What is the speed of the train
(a) 12 m/ sec (b) 10 m/sec
(c) 15 m/ sec (d) 20 m/sec

15. A 75 metre long train is moving at 20 kmph. It will cross a man standing on the platform in
(a) 12 seconds (b) 14 seconds
(c) 13.5 seconds (d) 15.5 seconds

16. A train passes a man standing on a platform in 8 seconds and also crosses the platform which is 264rnetres long in 20 seconds. The length of the train (in meters) is :
(a) 188 (b) 176
(c) 175 (d) 96

17. A man can reach a certain place in 30 hours. If he reduces his speed by 1/15th, he goes 10 km less in that time. Find his speed per hour.
(a) 6 km/hr (b) 5 km/hr
(c) 4 km/hr (d) 5 km/hr

18. A train is moving with the speed of 180 km/hr. Its speed (in meters per second) is :
(a) 5 (b) 40
(c) 30 (d) 50

19. A train takes 18 seconds to pass through a platform, from 162 m. long and 15 seconds to pass through another platform 120 m long. The length of the train (in m) is :
(a) 70 (b) 80
(c) 90 (d)105

20. A 120 meter long train is running at a speed of 90 km per hour. It will cross a railway platform 230 In long in :
(a) 24/5 seconds (b) 46/5 seconds
(c) 7 seconds (d) 14 seconds

21. If a train, with a speed of 60km/hr, crosses a pole in 30 seconds the length of the train (in meters) is :
(a) 1000 (b) 900
(c) 750 (d) 500

22. Two cars start at the same time from one point and move along two roads at right angles to each other. Their speeds are 36 km/hr. and 48 km/ hr. respectively. After 15 seconds the distance between them will be
(a) 400 m (b) 150 m
(c) 300 m (d) 250m

23. A train travelling at a speed of 30 m/sec crosses a platform, 600 meters long in 30 seconds, The length (in meters) of train is
(a) 120 (b) 150
(c) 200 (d) 300

24. A train 120 m long, takes 6 seconds to pass a telegraph post the speed of train is
(a) 72 km/hr (b) 62 km/hr
(c) 55 km/hr (d) 85 km/hr

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

26. A train passes a platform 60 meter long in 30 seconds and a man standing on the platform in 15 seconds, The speed of the train is :(km/hr)
(a) 12.4 (b) 14.4
(c) 18.4 (d) 21.6

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

28. A train 800 meters long is running at the speed of 78 km/hr, if it crosses a tunnel in 1 minutes, then length of the tunnel (in meters)
(a) 77200 (b) 500
(c) 1300 (d) 13

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

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30. In what time will a train 100 meters long cross an electric pole, if its speed be 144 km/hr. ?
(a) 2.5 seconds (b) 5 seconds
(c) 12.5 seconds (d) 17/4 Seconds

31. A man observed that a train 120 m. long crossed him in 9 seconds, The speed (in km/hr) of the train was
(a) 42 (b) 45
(c) 48 (d) 55

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

33. A train moves past a telegraph post and a bridge 264 m long in 8 seconds and 20 seconds respectively, speed of the train P h. 8
(a) 69.5 km/hr (b) 70 km/hr
(c)79 km/hr(d) 79.2 km/hr

34. A person standing on a railway platform noticed that a train took 21 seconds to completely pass through the platform which was 84 m long and it took 9 seconds in passing him. The speed of the train was
(a) 25.2 km/hr (b) 32.4 km/hr
(c) 50.4 km/hr (d) 75.6 km/hr

35. 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) 5/2 hours
(c) 9/2 hours (d) 5 hours

36. A train with a uniform speed passes a platform, 122 meters long, in 17 seconds and a bridge, 210 meters long in 25 seconds. The speed of the train is
(a) 46.5 km/hr (b) 37.5 km/hr
(c) 37.6 km/hr (d) 39.6 km/hr

37. A moving train crosses a man standing on a platform and a bridge 300 meters long in 10 seconds and 25 seconds respectively. What will be the time taken by the train to cross a platform 200 meters long?
(a) 50/3 seconds (b) 18 seconds
(c) 20 seconds (d) 22 Seconds

38. A train passes a platform 110 m long in 40 seconds and a boy standing on the platform in 30 seconds. The length of the train is
(a) 100 m (b) 110 m
(c) 220 m (d) 330 m

39. A train, with a uniform speed, crosses a platform, 162 meters long, in 18 seconds and another platform, 120 meters 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

40. A trail travelling with uniform speed crosses two bridges of lengths 300 m and 240 m in 21 seconds 18 seconds respectively. The speed of the train is :
(a) 72 km/hr (b) 68 km/hr
(c) 65 km/hr (d) 60 km/hr

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

42. A train isrunningat 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

43. The speed of two trains are in the ratio 6 : 7. If the second train runs 364 kin 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

44. 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

45. A train crosses a pole in 15 seconds and a platform 100 meters long 1n 25 seconds. Its length (in meters) is
(a) 50 (b) 100
(c) 150 (d) 200

46. 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

47. 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

48. 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 In (d) 74.5 m

49. A train starts from a place A at 6 a.m. and arrives at 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

50. 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

51. A man walks 'a' km in 'b' hours, The time taken to walk 200 meters is
(a) (200b/a) hours (b) (b/5a) hours
(c) (b/a) hours (d) (ab/200) hours

52. The speed (10/3) m/sec when expressed in km./hour becomes
(a) 8 (b) 9
(c) 10 (d) 12

53. A train is running at a speed of 90 km/hr. If crosses a signal in 10 sec., the length of the train in meters is

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(a) 150 (b) 324
(c) 900 (d) 250

54. The speed of 10 m/s is the same as
(a) 63 km/hr (b) 36 km/hr
(c) 69 km/hr (d) 18 km/hr

55. A train covers a distance of 20 km in 24 minutes. If its speed is decreased by 5 km/hr. the time taken by it to cover the same distance will be :
(a) 10 minutes (b) 26 minutes 40 sec
(c) 13 minutes (d) 11 minutes 20 sec

56. 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

57. A bullock cart has to cover a distance of 120 km, in 15 hours. If it covers half of the journey in 3/5th the 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

58. 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) 29/8 hours (b) 21/8 hours
(c) 37/8 hours (d) 3 Hours

59. A speed of 30.6 km/hr. is the same as
(a) 8.5 m/sec. (b) 10 m/sec.
(c) 12 m/sec. (d) 15.5 m/sec.

60. A man covers 9/20 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

61. A train 200 m long running at 36 kmph takes 55 seconds to cross a bridge of length of bridge is :
(a)375 m (b) 300 m
(c) 350 m (d) 325 m

62. A train 270 meters long is running at a speed of 36 km/hr. then it will cross a bridge of length 180 meters in
(a) 40 sec (b) 45 sec
(c) 50 sec (d) 35 sec

63. The ratio of length of two trains is 4 : 3 and the ratio of their speed is 6 : 5. The ratio of time taken by them to cross a pole is
(a) 5 : 6 (b) 11 ; 8
(c) 20: 18 (d) 27 : 16

64. 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

65. A train is moving at a speed of 80 Km/hr. and covers a certain distance in 4.5 hours. The speed of the train to cover the same distance in 4hours (in meters) is
(a) 100 km /hr (b) 70 km/hr
(c) 85 km/hr (d) 90 km/hr

66. The speed of 50.4 km/hr. is same as
(a) 14meter/second (B) 15 meter/second
(c) 28 meter/second (D) 10 meter/second

67. A train passes by a lamp post on platform in 7 sec and passes by the platform completely in 28 sec. If the length of the platform is 390 m, then length of the train (in meters) is
(a) 120 (b) 130
(c) 140 (d) 150

68. A train moving at a rate of 36 km/hr. crosses a standing man in 10 seconds. It will cross a platform 55 meters long in;
(a) 6 seconds (b) 7 seconds
(c) 31/2 seconds (d)11/2 Seconds

69. A train crosses a platform in 30 seconds travelling with a speed of 60 km/hr. If the length of the train be 200 meters, then the length (in meters) of the platform is
(a) 400 (b) 300
(c) 200 (d) 500

70. Ram travelled 1200 km by air which formed 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

71. 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 and 20 minutes. It reaches B at
(a) 1:20 am (b) 12 pm
(c) 6 pm (d) 11 pm

72. A man is walking at a speed of 10 kmph. After every km he takes a rest for 5 minutes How much time will he takes to cover a distance of 5 km
(a) 60 minutes (b) 50 minutes
(c) 55 minutes (d) 70 minutes

73. A train covers a distance of 10 km in 12 minutes,. If its speed is decreased by 5 km/hr. the time taken by it to cover the same distance is equal to
(a) 40 minutes (b) 40/3 minutes
(c) 20 minutes (d) 15 minutes

74. A is twice as fast as B and B is thrice as fast as C is. The journey covered by C in 1.5 Hours will be covered by A in
(a) 15 minutes (b) 2 minutes
(c) 30 minutes (d) 1 hour

75. A truck travels at 90 km/hr. for the first 3/2 hours. After that it travels at 70 km/hr. Find the time taken by the truck to travel 310 kilometers.
(a) 2.5 hrs. (b) 3 hrs.
(c) 3.5 hrs. (d) 4 hrs.

76. A car travels at a speed of 60 km/hr. and covets a particular distance in one hour. How long will it take

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for another car to cover the same distance at 40 km/hr.
(a) 5/2 hours (b) 2 hours
(c) 3/2 hours (d) 1 hours

77. A train 50 meters long passes a platform of length 100 meters in 10 seconds. The speed of the train in meter per second is
(a) 50 (b) 10
(c) 15 (d) 20

78. 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

79. A train travelling at a speed of 55 km/hr travels from place X to place Y in 4 hours. If its speed in 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

80. A speed of 45 km per hour is Same as
(a) 12.5 meters/second (b) 13 meters/second
(c) 15 meters/second (d) 12 meters/second

81. If a distance of 50 m is covered in 1 minute, then 90 m in 2 minutes and 130 m in 3 minutes find the distance covered in 15th minute,
(a) 610 m (b) 750 m
(c) 1000 m (d) 650 m

82. If a person travels form a point L. towards east for 12 km and then travels 5 km towards north and reaches a point M, then shortest distance from L to M is:
(a) 12 km (b) 14 km
(c) 17 km (d) 13 km

83. A train runs at an average speed of 75 km/hr. If the distance to be covered is 1050 kms. How long will the train take to cover it?
(a) 13 hrs (b) 12 hrs
(c) 15 hrs (d) 14 hrs

84. A train 180 meters long is running at a speed of 90 km/h. How long will it take to pass a post?
(a) 8.2 sec (b) 8 sec
(c) 7.2 sec (d) 7.8 sec

85. 2 km 5 m is equal to ?
(a) 2.5 km (b) 2.005 km
(c) 2.0005 km (d) 2.05 km

86. How II any seconds will a train 120 meters long running at the rate of 36 km/hr. take to cross a bridge of 360 meters in length?
(a) 48 sec (b) 36 sec
(c) 46 sec (d) 40 sec

87. 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)
(a) 5.28 (b) 528
(c) 52.8 (d) 0.528

88. A train passes an electrical pole in 20 seconds and passes a platform 250m long in 45 seconds. Find the length of the train
(a) 200 m (b) 250 m
(c) 300 m (d) 400 m

89. A car goes 20 meters in a second. Find its speed in Km/hr.
(a) 20 (b) 18
(c) 72 (d) 36

90. 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) 120 m (d) 152m

91. 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

92. Each wheel of a car is making 5 revolutions per seconds. 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

93. Walking at the rate of 4 kmph a man covets certain distance in 2 hrs 45 min. Running at a speed of 16.5 kmph the man will cover the same distance in how many minutes ?
(a) 35 min. (b) 40 min.
(c) 45 min. (d) 50 min.

94. A man rides at the rate of 18km/hr. but stops for 6 minutes, 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.

95. 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 form S towards R also with same 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

96. A train 180 m long moving at the speed of 20 m/sec. over-takes a man moving at a speed of 10m/sec in the same direction. The train passes the man in
(a) 6 sec (b) a sec
(c) 18 sec (d)27 sec

97. The distance between two cities and B is 330 km A train starts from A at 8 a.m. and travel towards at 60 km/hr and her 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

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

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99. How many seconds will a 500 meter 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 63 km/hr
(a) 25 sec (b) 30 sec
(c) 40 sec (d) 45 sec

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

101. Two trains one 160 m and the other 140 m long are running in opposite directions on parallel rails, the first at 77 km an hour and the other at 67km an hour. How long will they take to cross each other?
(a) 7 seconds (b) 15/2 seconds
(c) 6 seconds (d) 10 seconds

102. Two trains are running in opposite direction with the same speed. If the length of each train is 120 meters 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

103. A moving train, 66 meters long overtakes another train of 88 meters long, moving in the same direction in 0.4168 minutes. If the second train is moving at 30 km/hr. at what speed is the first train moving
(a) 85 km/hr (b) 52 km hr
(c) 55 km/hr (d) 25 km/hr

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

105. 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 at the same point. After what time will they next meet at the starting point again?
(a) 46 min 12 sec (b) 45 minutes
(c) 42 min 36 sec (d) 26 min 18 sec

106. Two trains 140 m and 160 m long run at the speed of 60 km/hr. and 40 km/hr. respectively in opposite directions on parallel tracks. The time (in seconds) which they take to cross, each other is :
(a) 10 sec. (b) 10.8 sec
(c) 9 sec (d) 9.6 sec

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

108. How much time does a train 50 m long, moving at 68 km/hr. take 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

109. 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

110. 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 18 seconds. The length (in meters) of the faster train is :
(a) 70 (b) 100
(c) 128 (d) 140

111. 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

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

113. 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) 5/2 hr
(c) 3 hr (d) 1 hr

114. 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) 16/7 seconds (b) 24/7 seconds
(c) 31/7 seconds (d) 38/7 seconds

115. Two trains 105 meters and 90 meters long runs at the speed of 45 km/hr. and 72 km/hr. respectively, in opposite directions on parallel tracks. The time which they take to cross each other is
(a) 8 seconds (b) 6 seconds
(c) 7 seconds (d) 5 seconds

116. Two trains travel in the same direction at the speed of 56 km/h. and 29 km/h. respectively. The faster train passes a man in the slower train in 10 seconds, The length of the faster train (in meters) is
(a) 100 (b) 80
(c) 75 (d) 120

117. Two trains of equal length, running in opposite directions, pass a pole in 18 and 12 seconds. The trains will cross each other in

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(a) 14.4 seconds (b) 15.5 seconds
(c) 18.8 seconds (d) 20.2 seconds

118. 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

119. A trains travelling at 48 km/hr, crosses another train, having half its length and travelling in oppositedirection 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

120. A bus moving at a speed of 45 km/hr. overtakes a truck 150 meters 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

121. A passenger train 150m long is travelling with a speed of 36km/hr. If a nan 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

122. 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

123. 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) 21 min. (d) 25 min.

124. 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

125. A train 300m long passed a In an 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/hr (b) 32 km/hr
(c) 360/11 km/hr (d) 393/11 km/hr

126. A train 240 m long crosses a man walking along the line in opposite direction at the rate of 3 km/hr. in 10 seconds. The speed of the train is
(a) 63km/hr(b) 75km/hr
(c) 83.4 km/hr (d) 86.4 km/hr

127. Two trains of length 70 m and 80 m are running at speed of 68 km/hr. and 40 km/hr. respectively on parallel tracks in opposite directions. In how many seconds will they pass each other?
(a) 10 sec (b) 8 sec
(c) 5 sec (d) 3 sec

128. Two trains of length 137 meter and 163 meter are running with speed of 42 km/hr. and 48 km/hr. respectively towards each other on parallel tracks. In how many seconds will they cross each other ?
(a) 30 sec (b) 24 sec
(c) 12 sec (d) 10 sec

129. Two trains, 80 meters and 120 meters long, are running at the speed of 25 km/hr and 35 km/hr respectively in the same direction on parallel tracks. How many seconds will they take to pass each other
(a) 48 (b) 64
(c) 70 (d) 72

130. A train 100 meters long meets a man going in opposite direction at 5 km/hr. and passes him in 36/5 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

131. 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

132. 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

133. 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

134. 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

135. Sarita and Julie start walking from the same place in the opposite directions. If Julie walks at a speed of 5/2 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

136. Two trains 108 m and 112 m in length are running towards each other on the parallel lines at a speed of 45 km/hr and 54 km/hr respectively. To cross each other after they meet, it will take
(a) 12 sec (b) 9 sec
(c) 8 sec (d) 10 sec

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137. Two trains 150 m and 120 m long respectively moving from opposite directions cross each other in 10 seconds. 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

138. Two trains, each of length 125 metre, are running in 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

139. A boy started from his house by bicycle at 10 a.m. at a speed of 12 km per hour. His elder brother started after 1 hr 15 minutes by 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) 56/3 (d) 9

140. A policeman goes after a thief who has 100 meters start, if the policeman runs a kilometer in 8 min, and the thief a km in 10 min, the distance covered by thief before he is over-take is
(a) 350 m (b) 400 m
(c) 320 m (d) 420 m

141. 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 fast train is
(a) 209/9 m (b) 27 m
(c) 250/9 m (d) 23 m

142. Two trains 180 meters and 120 meters in length are running towards each other on parallel tracks one at the rate of 65 km/hr and another at 55 km/hr. In how many second will they be clear of each other from the moment they meet ?
(a) 6 (b) 9
(c) 12 (d) 15

143. Two trains of same length, are running on parallel tracks in the same direction with speed of 60 km/hr. and 90 km/hr. respectively. The latter completely crosses the former in 30 seconds. The length of each train (in meters) is
(a) 125 (b) 150
(c) 100 (d) 115

144. Two trains 125 meters and 115 meters in length, are running toward each other on parallel lines, one at the rate of 33 km/hr and the other at 39 km/hr. How much time (in seconds will they take to pass each other from the moment they meet?
(a) 8 (b) 10
(c) 12 (d) 15

145. A thief steals a car at 1.30 p.m., and drives 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 overtake the thief at
(a) 5 p.m. (b) 4 p.m.
(c) 4.30 p.m. (d). 6 p.m.

146. Two trains 100 meters and 95 meters 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

147. 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) 3/2
(c) 3/8 (d) 2

148. 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 meter) ?
(a) 150 (b) 120
(c) 100 (d) 90

149. 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.

150. Two trains of equal length are running on parallel lines in the same direction at the rate of 46 km/hr and 36 km/hr, The faster train passes the slower train in 36 seconds. The length of each train is
(a) 50 m (b) 72 m
(c) 80 m (d) 82 m

151. Raj and Prem walk in opposite direction at the rate of 3 km 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) 61 km

152. A train 150m long passes a km stone in 30 seconds and another train of the sat Ile length travelling in opposite direction in 10 seconds. The speed of second train is :
(a) 90 km/hr (b) 125 km/hr
(c) 75 km/hr (d) 25 km/hr

153. Two trains of length 150 m and 180 In respectively are running in opposite directions on parallel tracks. If their speeds are 50 km/hr and58 km/hr, respectively, in what time will they cross each other?
(a) 11 seconds (b) 22 seconds
(c) 15 seconds (d) 30 seconds

154. A boy rides his bicycle 10 km at an average speed of 12km/hr and Again travels in average 12 km at an average speed of 10 km/hr. His average speed for the entire trip is approximately:
(a) 10.4 km/hr
(c) 11.0 km/hr (b) 10.8 km/hr (d) 12.2 km/hr

155. 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) (8000/123) km/hr (b) (3000/23) km/hr
(c) (7385/123) km/hr (d) 62 km/hr

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156. 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

157. A car completes a journey in 10hours. 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/hr (b) 480 km/hr
(c) 380 km/hr (d) 300 km/hr

158. A man covers half of his jouney at 6km/hr and the remaining half at 3 km/hr. His average speed is
(a) 9 km/hr (b)4.5 km/hr
(c) 4 km/hr (d) 3 km/hr

159. 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

160. 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/hr

161. A man completed a certain journey by a car. If he covered 30% of the distance at the speed of 20 km/hr, 60% of the distance at 40 km/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) 20 km/hr (d) 33 km/hr

162. 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) (x+y)/2xy (b) 2xy/(x+y)
(c) 2/(x+y) (d) 1/x +1/y

163. A man goes from Mysore to Banglore 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

164. A man goes from a place A to B at a speed of 12 km/hr and returns from B to A at a speed of 18 km/hr. The average speed for the whole journey is
(a) 72/5 km/hr (b) 15 km/hr
(c) 31/2 km/hr (d) 16 km/hr

165. A man covers the journey from station A to station B at a uniform speed of 36 km/hr and returns to A with a uniform, speed of 45 km/hr. His average speed for the whole journey is
(a) 40 km/hr (b) 40.5 km/hr
(c) 41 km/hr (d) 42 km/hr

166. 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) 100/3 km/hour
(c) 30 km/hour (d) 445/12 km/hour

167. The speed of a train going from Nagpur to Allahabad is 100 kmph. While its speed is 150 kmph when coming back from Allahabad to Nagpur. Then the average speed during the whole journey is:
(a) 120 kmph (b) 125 kmph
(c) 140 kmph (d) 135 kmph

168. P travels to 6 hours at the rate of 5km/hour and for 3 hours at the rate of 6km/hour. The average speed of the journey in km/hour is
(a) 16/5 (b) 16/3
(c) 20/9 (d) 12/5

169. 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 the distance
(a) 30 km/hr (b) 25 km/hr
(c) 18 km/hr (d) 10 km/h

170. On a journey across Kolkata, a taxi averages 50 km per hour for 50% of the distance, 40 km per hour for 40% of it and 20 km per hour for the remaining. The average speed (in km/hour) for the whole journey is :
(a) 42 (b) 40
(c) 35 (d) 45

171. A train goes from Ballygunge to Sealdah at an average speed of 20 km/hour and comes back at an average speed of 30 km/hour. The average speed of the train for the whole journey is
(a) 27 km/hr (b) 26 km/hr
(c) 25 km/hr (d) 24 km/hr

172. A train runs from Howrah to Bandel at an average speed of 20 km/hr and returns at an average speed 30 km/ hr. The average speed. (in km/hr) of the train in the whole journey is
(a) 20 (b) 22.5
(c) 24 (d) 25

173. A car covers four successive 7 km distances at speed of 10 km/hour, 20 km/hr , 30 km/hour, 60 km/hour respectively. Its average speed over this distance is
(a) 30 km/hour (b) 60 km/hour
(c) 40 km/hour (d) 20 km/hour

174. 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) 7202/7 km

175. 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) 3/2 hours
(c) 2 hours (d) 5/2 hours

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176. 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 minutes longer than B, the total distance of the journey is:
(a) 40 km (b) 48 km
(c) 50 km (d) 52 km

177. The speed of A and B are in the ratio 3 : 4. A takes 20 minutes more than B to reach a destination. In what time does A reach the destination?
(a) 4/3 hours (b) 2 hours
(c) 8/3 hours (d) 5/3 hours

178. 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

179. By walking at 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

180. Walking at 3/4 of his usual speed, a man is 3/2 hours late. His usual time to cover the same distance (in hours) is
(a) 9/2 (b) 4
(c) 11/2 (d) 5

181. Walking at $6/7^{th}$ of his usual speed a man is 25 minutes late. His usual time to cover this distance is
(a) 2 hours 30 minutes (b) 2 hours 15 minutes
(c) 2 hours 25 minutes (d) 2 hours 10 minutes

182. Walking $6/7^{th}$ of his usual speed a man is 12 minutes late. The usual time taken by him cover that distance in
(a) 1 hour (b) 1 hour 12 minutes
(c) 1 hour 15 minutes (d) 1 hour 20 minutes

183. Two men start together to walk a certain distance, one at 4 km/h and another at 3 km/hr. the former arrives half an hour before the latter. Find the distance
(a) 8 km (b) 7 km
(c) 6 km (d) 9 km

184. A and B started at the same time from the same place for a certain destination. B walking at 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

185. 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

186. A train running at 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

187. A man with 3/5 of his usual speed reaches the destination 5/2 hours late. Find his usual time to reach the destination
(a) 4 hours (b) 3 hours
(c) 15/4 hours (d) 9/2 hours

188. A car travelling with 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) 125/7 km/hr (b) 35 km/hr
(c) 25 km/hr (d) 30 km/hr

189. Walking at three-fourth of usual speed, a man covers a certain distance in 2 hours more than the time he takes to cover the distance at his usual speed. The time taken by him to cover the distance with his usual speed is
(a) 4.5 hours (b) 5.5 hours
(c) 6 hours (d) 5 hours

190. Two cars are moving with a speed V1, V2 towards a crossing along two roads , if their distance from the crossing be 40 meters and 50 meters at an instant of time then they do not collide if their speed are such that
(a) V1 : V2 = 16 : 25 (b) V1 : V2 ≠ 4: 5
(c) V1 : V2 ≠ 5 : 4 (d) V1 : V2 ≠ 25 : 16

191. A person started his journey in the morning, At 11 a.m. he covered of the journey and on the same day at 4.30 p.m. he covered 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.

192. A runs twice as fast as B and B runs thrice as fast as C. The distance covered by C in 72 minutes, will be cowered by A in :
(a) 18 minutes (b) 24 minutes
(c) 16 minutes (d) 12 minutes

193. 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

194. 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 of his speed and B travelled with double of his speed they would have met after 5 hours, The speed of A is
(a) 4 km/h. (b) 6 km/hr
(c) 10 km/hr (d) 12 km/hr

195. A is twice as fast runner as B, and B is thrice as fast runner as C. If C travelled a distance in 1 hour 54 minutes, the time taken by A to cover the same distance is
(a) 19 minutes (b) 38 minutes
(c) 51 minutes (d) 57 minutes

196. 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

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(c) 6.25 (d) 7.5

197. A car driver leaves Bangalore at 8.30 A.M. and expects to reach a place 300 km from Bangalore at 12.30 P.M. At 10.30 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 (b) 40 km/hr

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

198. Two towns A and B are 500 km, apart. A train starts at 8 AM from A towards B at a speed of 70 km/hr. At 10 AM, another train starts from B towards A at a speed of 110 km/hr. When will the two trains meet

(a) 1 pm (b) 12 Noon

(c) 12:30 pm (d) 1:30 pm

199. A man goes from a place A to B at a speed of 12 km/hr and returns from B to A at a speed of 18 km/hr, The average speed for the whole journey is

(a) 72/5 km/hr (b) 15 km/hr

(c) 31/2km/hr (d) 16 km/hr

200. 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

201. 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) 110/3 (d) 40

202. 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

203. A boy goes to his school from his house at a speed of 3 km/hr and returns at a speed of 2 km/hr, If he takes 5 hours in going and coming, the distance between his house and school is ;

(a) 6 km (b) 5 km

(c) 5.5 km (d) 6.5 km

204. A student walks from his house at a speed of 5/2 km per hour and reaches his school 6 minutes late, The next day he increases his speed by 1 km and reaches 6 minutes before school time. How far is the school from his house?

(a) 5/4 km (b) 7/4 km

(c) 9/4 km (d) 11/4 km

205. A person, who can walk down a hill at the rate of 9/2 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

(c) 15 km (b) 3 km (d) 9 km

206. Ram arrives at a Bank 15 minutes earlier than scheduled time if he drives his car at 42 km/hr. If he drives car at 35 km/hr he arrives 5 minutes late, The distance of the Bank from his starting point is

(a) 70 km (b) 210 km

(c) 72 km (d) 60 km

207. A boy is late by 9 minutes if he walks to school at a speed of 4 km/hour, If he walks at the rate of 5 km/hour, he arrives 9 minutes early. The distance to his school is

(a) 9 km (b) 5 km

(c) 4 km (d) 6 km

208. A car can cover a certain distance in 9/2 hours. If the speed is increased by 5 km/hour. It would take 1/2 hours less to cover the same distance. Find the slower speed of the car.

(a) 50 km/hr (b) 40 km/hr

(c) 45 km/hr (d) 60 km/hr

209. Shri X goes to his office by scooter at a speed of 30 km/hr and reaches 6 minutes earlier. If he goes at a speed of 24 km/hr, he reaches 5 minutes late. The distance of his office is

(a) 20 km (b) 21 km

(c) 22 km (d) 24 km

210. Walking at 5 km/hr. a student reaches his school from his house 15 minutes early and walking at 3 km/hr he is late by 9 minutes. What is the distance between his school and his house?

(a) 5 km (b) 8 km

(c) 3 km (d) 2 km

211. A student goes to school at the rate of 5/2 km/h and reaches 6 minutes late. If he travels at the speed of 3 km/hr, he is 10 minutes early. The distance (in km) between the school and his house is

(a) 5 (b) 4

(c) 3 (d) 1

212. When a person cycled at 10 km/hr he arrived at his office 6 minutes late. He arrived 6 minutes early when he increased his speed by 2 km/hr. The distance of his office from the starting place is

(a) 6 km (b) 7 km

(c) 12 km (d) 16 km

213. If I walk at 5 km/hr, I miss a train by 7 minutes. If however, I walk at 6 km/hr, I reach the station 5 minutes before the departure of the train. The distance (in km) between my house and the station is

(a) 6 (b) 5

(c) 4 (d) 3

214. 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

215. Walking at a speed of 5 km/hr. a man reaches his office 6 minutes late. Walking at 6 km/hr. he reaches there 2 minutes early. The distance of his office is

(a) 3km (b) 4 km

(c) 3.5 km (d) 2 km

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216. If a boy walks from his house to A school at the rate of 4 km per hour, he reaches the school 10 minutes earlier then the scheduled time. However, if he walks at the rate of 3 km/hr, he reaches 10 minutes late find the distance of his school from his

(a) 5 km (b) 4 km

(c) 6 km (d) 4.5km

217. You arrive at your school 5 minutes late if you walk with a speed of 4 km/hr, but you arrive 10 minutes before the scheduled time if you walk with a speed of 5 km/h. The distance of your school from your house (in km) is

(a) 4 (b) 5

(c) 10 (d) 2

218. A car travels from P to Q at a constant speed. If its speed were increased by 10 km/h, it would have been taken one hour lesser to cover e 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

219. If a man walks at the rate of 5 km/hour, he misses a train by 7 minutes. However if he walks at the rate of 6 km/hour, he reaches the station 5 minutes before the arrival of the train. The distance covered by him to reach the station is

(a) 7 km (b) 6.25 km

(c) 6 km (d) 4 km

220. A students goes to school at the rate of 5/2 Km/hr and reaches 6 minutes late. If he travels at the speed of 3Km/hr he is 10 minutes early. What is the distance to the school?

(a) 10/3 km (b) 4 km

(c) 7/2 km (d) 1 km

221. 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 been one hour longer on the road. The distance (in km) is:

(a) 60 (b) 45

(c) 65 (d) 80

222. 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

223. 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

224. Two trains start from stations A and B and travel towards each other at speeds of 50 kmph and 60 kmph. respectively. At the time of their meeting, the second train has travelled 90 km more than the first. The distance between A and B is

(a) 1200 km (b) 1440 km

(c) 1320 km (D) 990 km

225. Two trains start from station A and B and travel towards each other at speed of 16 miles/hour and 21 miles/hour respectively. At the time of their meeting, the second train has travelled 60 miles more than the first. The distance between A and B (in miles) is :

(a) 444 (b) 496

(c) 333 (d) 540

226. Two trains start at the same time from Aligarh and Delhi and proceed towards each other at the rate of 14 km/hr and 21 km per hour respectively. When they meet, it is found that one train has travelled 70 km more than the other. The distance between two stations is

(a) 140 km (b) 350 km

(c) 210 km (d) 330 km

227. I walk a certain distance and ride back taking a total time of 37 minutes, I could walk both ways in 55miuntes. How long would it take. to ride both ways?

(a) 9.5 minutes (b) 19 minutes

(c) 18 minutes (d) 20 minutes

228. 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

229. A mall takes 6 hours 15 minutes in walking a distance and riding back to the starting place. He could walk both ways in 7 hours 45 minutes, The time taken by him to ride both ways, is

(a) 4 hours (b) 4 hours 30 minutes

(c) 4 hours 45 minutes (d) 5 hours

230. 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 speed of the two trains was

(a) 2: 1 (b) 3:2

(c) 4:3 (d) 5: 4

231. 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

232. A man travelled a distance of 61 km in 9 hours, partly on foot at the rate of 4 km/hr and partly on bicycle at the rate of 9 km/hr. The distance travelled on foot was

(a) 12 km (b) 16 km

(c) 20 km (d) 24 km

233. 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

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were to travel 100 km by train and rest by car .The speed of the train is:
(a) 50 km/hr
(c) 100 km/hr (b) 60 km/hr (d) 120 km/hr

234. A man travelled a distance of 80 km in 7 hrs partly on foot at the rate of 8 km per hour and partly on bicycle at 16 km per hour. The distance travelled on the foot is
(a) 32km (b) 44 km
(c) 36km (d) 44km

235. A farmer travelled a distance of 61 km in 9 hours. He travelled partly on foot at the rate 4 km/hour and partly on bicycle at the rate 9 km/hour. The distance travelled on foot is
(a) 16 km (b) 17 km
(c) 14 km (d) 15 km

236. A and B run a kilometer and A wins by 25 sec. A. and C run a kilometer 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 kilometer is
(a) 2 min 25 sec (b) 2 min 50 sec
(c) 3 min 20 sec (d) 3 min 30 sec

ANSWER :

1 b	**2** d	**3** c	**4** c	**5** d	**6** b
7 c	**8** d	**9** d	**10** d	**11** b	**12** c
13 b	**14** a	**15** c	**16** b	**17** d	**18** d
19 b	**20** d	**21** d	**22** d	**23** d	**24** a
25 c	**26** b	**27** b	**28** b	**29** b	**30** a
31 c	**32** b	**33** d	**34** a	**35** a	**36** d
37 c	**38** d	**39** c	**40** a	**41** b	**42** b
43 c	**44** b	**45** c	**46** d	**47** c	**48** a
49 c	**50** b	**51** b	**52** d	**53** d	**54** b
55 b	**56** c	**57** c	**58** b	**59** a	**60** c
61 c	**62** b	**63** c	**64** a	**65** d	**66** a
67 b	**68** c	**69** b	**70** b	**71** a	**72** b
73 d	**74** a	**75** d	**76** c	**77** c	**78** a
79 c	**80** a	**81** a	**82** d	**83** d	**84** c
85 b	**86** a	**87** c	**88** a	**89** c	**90** a
91 c	**92** d	**93** b	**94** b	**95** c	**96** c
97 c	**98** b	**99** b	**100** a	**101** b	**102** c
103 b	**104** a	**105** a	**106** b	**107** c	**108** d
109 b	**110** d	**111** d	**112** c	**113** a	**114** b
115 b	**116** c	**117** a	**118** d	**119** d	**120** a
121 d	**122** c	**123** b	**124** c	**125** d	**126** c
127 c	**128** c	**129** d	**130** a	**131** b	**132** c
133 b	**134** b	**135** a	**136** c	**137** a	**138** b
139 c	**140** b	**141** c	**142** b	**143** a	**144** c
145 b	**146** b	**147** b	**148** c	**149** c	**150** a
151 b	**152** a	**153** a	**154** b	**155** b	**156** b
157 b	**158** c	**159** c	**160** a	**161** a	**162** b
163 a	**164** a	**165** a	**166** b	**167** a	**168** b
169 c	**170** b	**171** d	**172** c	**173** d	**174** c
175 c	**176** c	**177** a	**178** b	**179** b	**180** a
181 a	**182** b	**183** c	**184** c	**185** a	**186** c
187 c	**188** b	**189** c	**190** b	**191** d	**192** d
193 b	**194** b	**195** a	**196** a	**197** d	**198** b
199 a	**200** d	**201** d	**202** c	**203** a	**204** b
205 d	**206** a	**207** d	**208** b	**209** c	**210** c
211 b	**212** c	**213** a	**214** c	**215** b	**216** b
217 b	**218** b	**219** c	**220** b	**221** a	**222** c
223 c	**224** d	**225** a	**226** b	**227** b	**228** d
229 c	**230** b	**231** c	**232** b	**233** c	**234** a
235 a	**236** a				

1. (b) Time = Time/ Speed
Thus, Time = (4/5)/45 = 4/225 hrs
Time (sec.) = 4/225 × 3600 = 64 sec.

2. (d) Distance = Constant
So, Speed $\propto$ 1/Time
Ratio of time = 5 : 5/3
Ratio of time = 3 : 1
Ratio of speed = 1 : 3
1 unit → 240 km/hr
3 units → 240 × 3
= 720 km/hr

3. (c) Speed = 30 km/hr = 30 × 5/18 m/sec
= 25/3m/sec.
So, time = D/S = 100/(25/3) = 12 sec.

4. (c) Time taken at 5 km/hr = 20/5
= 4 hr.
Actual time = (4 – 2/3) = 10/3 hrs.
Time taken at 8 km/hr = 20/8
= 5/2 hrs
Time difference = 10/3 – 5/2 = 5/6 hrs.
= 50 min. required time.

5. (d) 15 min. = ¼
1 hrs = 5 kms.
¼ hrs = 5/4 kms.
So, length of bridge = 5/4 kms. = 1250 mt.
Alternate: V = 5 km/hr = 5 × 1000/60 m/min
= 250/3 m/min
l = 250/3 × 15 = 1250 mtr.

6. (b) S = D/T = 250/75 m/sec = 250/75× 18/5
= 12 km/hr

7. (c) $L_t = L_P = l$
S = 90 km/hr = 90×1000/60 mt./min
= 1500 mt./min
→ $l = L_t = L_P$ = 750 mt

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8. (d) Distance travelled in 14 sec. = 50 + l
Distance travelled in 10 sec.
= l
So, Speed of train = 50/(14 - 10) m/sec.
= 50/4 × 18/5 km/hr = 45 km/hr

9. (d) Speed = D/T = D/T = 200/24 m/sec
= 200/24 × 18/5 km/hr
= 30 km/hr

10. (d) Speed = 10m/sec = 10 × 18/5 km/hr
= 36 km/hr

11. (b) Speed = 150/25 m/sec = 6 × 18/5 km/hr.
= 21.6 km/hr

12. (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 mtr.
Speed = 400/40 m/sec. = 10 m/s
Distance covered in 60 sec. = 10 × 60 = 600 meter
So, 400 + l = 600
→ l = 200 meter

13. (b) Speed = D/T = 125/30 m/sec.
= 125/30 = 18/5 km/hr
= 15 km/hr

14. (a) Speed = 120/10 m/sec. = 12 m/sec

15. (c) T = D/S = (75 × 18)/(20 × 5) = 27/2 sec.
= 13.5 sec.

16. (b) Distance travelled in 8 sec = l
Distance travelled in 20 sec. = 1 + 264
Speed = (l + 264 - l)/(20 - 8) m/sec = 264/12
= 22 m/sec.
Distance travelled in 8 sec = l = 8 × 22 = 176 mt

17. (d) Actual : Reduced
Ratio of speed = 15 : 14
Ratio of time = 14 : 15
14 → 28 hrs
15 → 30 hrs
So, in 2 hrs it travels 10 kms
Speed = 10/2 = 5 km/hr

18. (d) Speed of the train is = 180 km/hr
Thus, 1 km/hr = 5/18
Because, 1 km = 1000 meters
1 hrs = 60 × 60 second
= 1000/60 × 60 → 5/18 m/s
Thus, Speed in m/s = 180 × 5/18
= 50 m/s

19. (c) Let the length of the train = l meter
and the length of the plateform l^1= 162 meters
another platform's length l^2
= 120 meters
When a train crosses a plateform i.e.it covers the equal distance of length of train + length of plateform
ATQ
(l + l)/speed = $time_1$ = (l + 162)/speed = 18 second
= (l + 162)/18 = speed ……. (i)
Again,
(l + l)/speed = $time_2$=
(l + 120)/speed = 15 second
= (l + 120)/15 = Speed …….. (ii)
(i) = (ii) because speed of the same train is equal
= (l + 162)/18 = (l + 120)/15
→ (l + 162)/6 = (l +120)/5
→ 5l + 810 = 6l + 720
→ 6l – 5l = 810 – 720
→ l = 90 meters
So the length of the train is 90
Alternate: Length of the train = $(l_1 t_2 – l_2 t_1)/(t_1 – t_2)$
= (162 × 15 – 120 × 18)/(18 - 15)
= 3 (162 × 5 – 120× 6)/3 = 90 meters

20. (d) Thus , Speedo of the running train is = 90 km/hr.
Length of the train is = 120 meters
We know that,
When A train crosses through the plateform, it covers the equal distance of the length of plateform + length of train
So, the time will be taken by the train = (Length of train + length of plateform)/Speed
= (120 + 230)meter/90 km/h = (350 × 18)/(90 × 5)
= 14 second

21. (d) The length of pole is considered as negligible i.e. = 0
i.e. When A train crosses a pole, it covers the distance of the length of itself.
the time is taken by the train 30 seconds and speed = 60 km/h
then the length of the train = 60 kmh × 30 seconds

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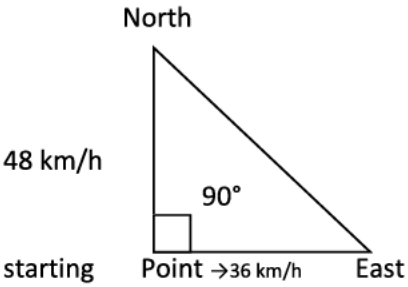
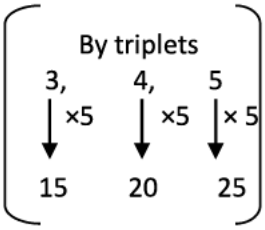
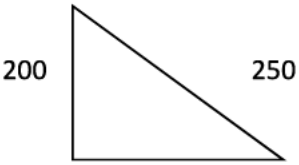
= 60 × 5/18 × 30 meters
= 10 × 5/3 × 30 = 500 meters

22. (d)



→ Distance, covered by car in 15 seconds with the speed of 48 kmph
towards the north= 48 × 5/15 × 15 = 25 × 8 = 200 m
Distanced covered by car is 15 second with the speed 36 km/h towards the East.
= 36 × 5/18 × 15 = 150 m





After 15 seconds the distance between both the conditions of car is = 250 m

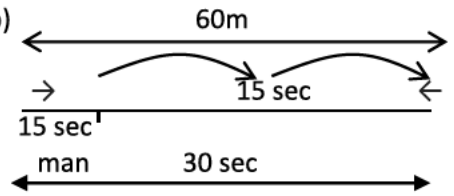
23. (d) Total distance covered by the train in 30 seconds with the speed of 30 m/s is = 30 × 30 m/s = 900 meters
Total distance = train's distance + platform's distance
900 = train's distance + 600 (when train crosses through plateform it covers equally distance of length of train + length of plateform)
Alternate:
Time = Distance/speed 30 sec.
= (Plateform + train length)/Speed
30 = (600 + train)/30
train's length = 900 – 600 = 300 meters

24. (a) Speed of the train's = Distance/time
= 120/6 = 20 m/s → 72 km/h

25. (c) A : B length
Ratio of A and → 5 : 2 (5x : 3x)
B's length
Ratio of A and
B's speed → 6 : 5 (6y : 5y)
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 = Total distance/Speed = 5x/6y
Time, taken by train B to cross the pole
= Total distance/ Speed = 3x/5y
A : B
Ratio of the their time
= 5x/6y : 3x/5y = 25 : 18
Alternate: Ratio of length 5 : 3

Ratio of Speed 6 : 5
Ratio of time to cross a pole = 5 × 5 : 6 × 3 = 25 : 18

26. (b)



i.e. train crosses plateform in
= (30 - 15) = 15 second
Speed of train = 60/15 = 4 m/s
Speed of train = 4 × 18/5 km/h = 14.4 km/h

27. (c) Time C/S = 300 + 200/25 = 20 sec.

28. (b) Speed = 78 km/hr
= 78/60 × 1000 m/min
= 1300 m/min
Distance travelled in 1 min
= 1300 mtr.
→ 1300 = l + 800
→ l = 500 mt. = length of tunnel

29. (b) Speed = 132 km/hr = 132 × 5/18 m/sec = 110/3 m/sec
T = D/S = (110 + 165)/(110/3) = 3 (275)/110
= 7.5 sec.

30. (a) Speed = 144 km/hr = 14 × 5/18 m/sec

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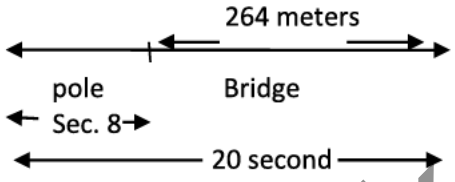
= 40 m/sec
T = D/S = 100/40 sec. = 5/2 = 2.5 sec.

31. (c) Speed =D/T = 120/9 m/s
= 120/9 × 18/5 km/hr = 48 km/hr

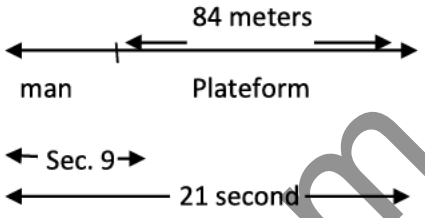
32. (c) Truck covers in a minute = 550 meters then the speed of the truck will be = 550/60 → 55/6 m/s ..... (i)
Whereas, Bus covers on 45 minutes = 33 kms, then the speed of the bus will be = 33 kms/45 minutes
→ 33 × 1000/(45 × 60)
[1 km = 1000 meters
1 min = 60 second]
→ 110/9 m/s ..... (ii)
So, the Ratio of their speed will be = 55/6 : 110/9
= ½ : 2/3 = 3 : 4 (Truck : Bus)
Alternate:
thus, [Speed = Distance/Time]
Ratio (Truck : Bus) = 550/60 m/s
= (33 × 1000)/(45 × 60) = 3 : 4

33. (d) A pole has negligible length regarding a length of train i.e. =
0 when a train crosses a pole i.e it covers the distance of itself = 20 – 8 = 12 second



i.e. then the speed of train = 264 meters/12 second
= [Speed = Distance/Time]
= 22 m/s
= 22 × 18/5 = 79.2 km/h
[Thus, 1 m/s = 18/5 km/h]

34. (a) Pole, man post office box, tree have neglible length.
21 - 9 = 12 second



i.e. train crosses only bridge in = 12 seconds then the speed of train
= 84 meters/12 second [Speed = Distance/Time]
= 7 m/s = 7 × 18/5 = 126/5
= 25.2 km/h
i.e, train crosses only bridge in = 12 seconds then the speed of train = 84 meters/12 second
[Speed = Distance/time]
= 7 m/s = 7 × 18/5 = 126/5
= 25.2 km/h

35. (a) Boy runs a distance of 20 km in 2.5 hrs.
Speed of boy = 20/(5/2)hrs
(time = distance/speed)
= 8 km/hr
If the speed is doubled the new speed will be = 8 × 2 = 16 km/hr
then the time will be taken by the boy to run = 32 kms
Time = 32/16 = 2 hrs
[Time = Distance/Speed]

36. (d) Let the speed of the train = s m/s and length = l m
According to the question,
Time, taken by train to cross the plateform = 17 second
i.e. = (l + 122)/speed = 17
l + 122 = 17 speed
l = 17 speed – 112 ..... (i)
→ Time, taken by train to cross the bridge = 25 second

(l + 210)/Speed =25

l + 210= 25 speed

l = 25 speed – 210 ..... (ii)

Thus, Length of the train in same

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thus , (i) ..... (ii)

17 speed – 122 = 25 speed – 210

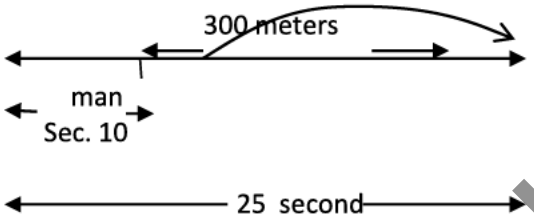
8 speed = 210 – 122

8 speed = 88

Speed = 88/8 = 11 m/s

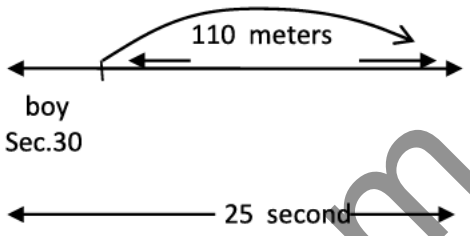
Speed = 11 × 18/5 = 198/5 = 39.6 km/h
Alternate:
Difference of the length of the objects which is crossed by train and the result is divided by difference of time.
Speed of train = (210 - 122)/(25 - 17) = 11 m/s
= 11 × 18/5 = 39.6 km/h

37. (c) 25 – 10 = 15 seconds



If train crosses the plateform i.e. it covers the distance equal the length of train and plateform.
→ In the question train crosses the man who stands on the plateform In 10 seconds and crosses the man + plateform in 25 seconds i.e. train crosses the plateform which length is 300 meters in 25 – 10 = 15 second, here train's length is not added.
So, speed of the train= 300/15 → 20 m/sec.
→ Length of the train = 10 × 20 = 200 meters
(In train crosses the only man in 10 seconds)
→ Time, taken by the train to cross a platform 200 meter long
= {(length of train + plateform)/ speed
= (200 + 200)/20 = 400/20
Time, taken by train = 20 seconds

38. (d) (40 - 30) = 10 seconds



According to the explanation of question (101)
→ Speed of the train = 110/10
= 11 m/s
→ Length of the train = 30 × 11 = 330 meter(If train crosses a man, it crosses itself)

Alternate:
→ Let the speed of the train = s meter/second
→ and length = l meter
→ According to the question,
→ Length of the train l = (x × 30) meter ..... (i)
In the respect of bridge
(l + 10)/x = 40 second
[Distance/speed = time] → 30x+ 110/x
= 400 → 30x + 110 = 4x
→ 10x = 110
→ x = 11 m/s
→ speed = 11 m/s
→ then length = (10 × x) meters
30 × 11 = 330 meters

39. (c) Let the speed of train = x m/s
→ Length of train = l meters
ATQ → (l + 162)/x = 18
[Distance/Speed = time]
→ l + 162 = 18x
→ Length = 18x - 162 ..... (i)

Again, (l + 120)/x = 15
→ l + 120 = 15x
→ Length = 5x – 120 = ... (ii)
→ Length of the train is equal
(i) = (ii)
→ 18x – 162 = 15x – 120
→ 3x = 42
→ Speed of train = 14 m/s = 150.h km/h

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Alternate :
Speed of train
Difference of plateform length/ difference of time taken to cross the plateform
→ (162 - 120)/(18 - 15)
→ Speed = 14 m/s = 50.4 km/h

40. (a) Shortcut :
Speed of the train, when it crosses two bridges
→ Speed = Diff. of the length of plateform/Diff. of time taken to cross plateform
= (300 – 240)meters/(21 – 18) sec. = 60/3 → 20 m/s
20 m/s speed change into km/hr = 20 × 18/5 = 72 km/h
Alternate:
Let the speed of train = x m/s
Length of train = 1 meters
→ According to the question,
→ First situation
→ (l + 300)/x = 21
Length = 21x – 300 ……. (i)
Again, (l + 240)/x = 18
Length = 18x - 240 .. (ii)
Thus length is equal
→ therefore
(i) = (ii)
→ 21x - 300 = 18x - 240
→ 3x = 60
→ x = 20 m/s
Speed in kmph
= 20 × 18/5 = 72 kmph

41. (b) Given:
→ Speed of Running train = 60 km/h
→ Length of Running train = 110 meters
→ Length of standing train = 170 meters
→ Speed of the standing train = 0 km/hr
→ Time taken by Running train to cross the standing train = (110 + 170)meters/60 km/hr
→ Time = (280× 18)/(60 × 5)
→ Time = 16.8 seconds

42. (b) We know when a train crosses a pole/man tree in this cross it crosses itself.
→ Therefore, → Length of the train → Speed × Time
→ Length = 36 × 5/18 × 25 meter
Length of train = 250 meters

43. (c) Given 1st. : 2nd train
Ratio of speed of trains 6 : 7
→ Second train covers 364 kms in 4 hours then its speed = 91 km/hr
→ In the question it is gives that speed of the second train = 7 Ratio but actual speed = 91 km/hr
i.e. 7 ratio → 91
→ 1 ratio → 13 km.
Therefore,
Speed of the first train is → 6R → 6 × 13 = 78 km/hr

44. (b) Total distance = 4 × 15/4 = 15 km
→ Time taken on cycle = 15 / 16.5 × 60
= 54.55 minutes

45. (c) We can interred that train crossed only plateform not its length in 25 - 15 = 10 second
→ Speed of the train = 100meters / 10 second = 10 m/s
Train crosses the pole in the 15 seconds and we know when train crosses a pole/man this case it covers the equal distance of its length.
Therefore, Length of train = 15 × 10 = 150 meters

46. (d) Speed of train = $\frac{700+500}{10}$ = 120ft/ second

47. (c) 1 km/hr = 5/18 m/s
= 90 km/hr = 90 × 5/18 = 25 m/s

48. (a) Required distance = 72 × 5/18 × 5
= 100m

49. (c) Total time taken by train = 21/2 hr.
= Total distance = 21/2 × 40 = 420 km

50. (b) Speed of train = $\frac{10\times60}{12}$ = 50 km/hr
→ New speed = 500 – 5 = 45 km/hr
→ Required time = 10 / 45 = 2/9 × 6 = 13 minute/ 20 second

51. (b) Speed of the man = a/b km/hr
= 200/1000 × b/a hours

52. (d) 1 m/sec = 18/5 km/hr
10/3 m/sec = 10 / 3 × 18/5 = 12 km/hr

53. (d) Length of the train = 90 × 5/18 × 10 = 250 meters

54. (b) 1m/s = 18/5 km/hr
= 10 m/s = 18/5 × 10 = 36 km/hr

55. (b) Speed of the train = 20/24 = 50 km/hr
New speed = 50 – 5 = 45 km/hr
Required speed = 50 – 5 = 45 km/hr
Required time = 20/45 = 4/9 hr

56. (c) In these type of question use the given below

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formula to save your valuable time.

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

Where S_1, S_2, and T_1, T_2 Are the respective speeds and times of the objects.

$= 45/ S_2 = \sqrt{\frac{10}{\frac{3}{24}{5}}}$

$= S_2 = 45 \times 6/5 = 54$ km/hr

Required speed = 24 km/hr

57. (c) Total distance = = 120 km

→ total time = 15 hours

→ He covers half of the journey $\frac{3^{th}}{5}$ = 15 × 5/3 = 9 hours

→ Remaining distance = 120 – 60 = 60 km

→ 6 hours

→ Average speed to cover a distance of 60 km will be = $\frac{60\ km}{6\ hour}$ [Speed = distance/ time]

→ Avg. speed → 10 km/hr

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

→ Total distance, covered by train

$= 60 \times \frac{210}{60} = 210$ kms

Therefore, the time taken by the train, to cover the same distance i.e.

$= \frac{210}{80}$ time

59. (a) We know that, 1 km/ hr = 5/18 m/s

[1 km/hr = $\frac{1000m}{60\times60s}$]

→ then, 30.6 km/hr = $30.6 \times \frac{5}{18}$ m/s

= 1.7 × 5 = 8.5 m/s

60. (c) Man covers $\frac{9}{20}$ of the journey by bus =

→ Remaining journey = $1 - \frac{9}{20} = \frac{11}{20}$

→ According to question = $\frac{11}{20}$

→ $\frac{11}{20}$ of the journey = $\frac{11}{20} \times 10$

= 18.18 km

61. (c) Distance covered by train at 36 kmph in 55 seconds is = 36 kmph × 55 second

(Distance = Time × Speed)

= 550 meter

→ 550 meter

→ 550 meter = Total distance

→ 550 meter = train's length + length of bridge

→ 550 meter = 200m + length of bridge

→ length of bridge = 350 meters

Alternate: Time = $\sqrt{\frac{l1+l2}{Speed}}$ $55 = \sqrt{\frac{200+l2}{36\times5/18}}$ → l_2 = 350m

62. (b) According to question (174)

Crossing time = $\sqrt{\frac{l1+l2}{Speed}}$

→ $\sqrt{\frac{270+180}{36\times5/18}} = \frac{450}{10}$ time

= 45 second

63. (c) Let the length of trains = 4x, 3x unit

Let the speed of trains = 6y , 5y

→ Ratio of their time to cross a pole = $\frac{4x}{6y} : \frac{3x}{5y}$

= {Time = $\frac{Distance}{Speed}$}

→ Ratio of time = 20 : 18

64. (a)

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

Ratio of their speed (Jogger : Cyclist)

= ½ : 2/1 → 1 : 4

65. (d) In the first situation,

→ Total distance covered by train

$= 80 \times \frac{9}{2} = 360$ kms

→ Therefore,

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

$\frac{360}{4}$ {Speed = $\frac{Distance}{Time}$} = 90 km/h

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

50.4 km/hr = $\frac{5}{18} \times 50.4$ = 14 m/s

67. (b)

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

→ Speed of the train = $\frac{390meter}{21\ sec.}$ → $\frac{130}{7}$ m/s

We know that,

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

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→ So the length of the train = 130/7 m/s × 7 sec
= 130 meters

68. (c) According to the explanation of the question.
→ length of the train = Speed × Time = 36 km/hr × 10 sec
= 36 × 5/18 m/s × 10 sec.
= 100 meters
Therefore,
Time taken by train to cross a plateform of 55 meter long in time
= (100 + 55)/36 × 5/18 = 155/10
Time = 31/2 sec.

69. (c) Total distance, covered by train in 30 sec. with, speed of 60 km/hr. Distance = 60 kmph × 30 sec.
= 60 × 5/18 m/s × 30 sec
= 500 meters
→ Distance of train + Length of plateform = 500 m
→ 200 + plateform = 500
= 500 – 200 = 300 meters

70. (b) $\frac{2^{th}}{5}$ of journey = 1200 km
Thus, total journey = $1200/2 \times 5$ = 3000 km
Distance travelled by car
= 3000 × 1/3 = 1000 meter
Therefore,
Remaining distance covered by train is
= 3000 - (1200 + 1000)
= 800 meters

71. (a) Time will be taken by train it does not stop
= Distance/speed = $\frac{999\ kms}{55.5\frac{km}{hr}}$
Without stop = 18 hr
→ But if stops on the way for 1 hour 20 min before reaching at B.
→ Total time = 18 hr + 1 hour 20 min
= 19 hours 20 min
→ Reaching time at B = 6 am + 19 hour 20 min

72. (b) Time taken by man if he did not stop
= $\frac{5km}{10\ kmphs}$ = 1/2 h = 30 min
→ Thus man takes rest for 5 minutes on each km
→ Total rest time = 5 × 4 = 20 min
→ Total travelling time = 30min + 20 min = 50 min

(d) According to question,

	A	:	B	:	C
	2	:	1		
	3	:	1		
	A		B		C
Ratio of speed	6	:	3	:	1
Ratio of time	1/6	:	1/3	:	1/1

[time $\propto \frac{1}{speed}$]
= 1 : 2 : 6
× 1/4 ↓
3/2
Time taken by = 1 ratio = 1 × ¼ hours = 15 min

73. According to Question,

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

[time $\propto \frac{1}{speed}$]
= 1 : 2 : 6
Time taken by A,.
= 1 ratio = $1 \times 1/4$ hours = 15 min

74. (d) Total distance = 310 kms
→ Distance travelled by truck in $\frac{3}{2}$ hours with speed 90 km/hr
= $\frac{3}{2}$ hour × 90 km/hr
= 135 km
→ Remaining distance = 310 – 135 = 175 km
→ Time will be taken to cover 175
= $\frac{175}{70}$ → 2.5 hours
Total time = 2.5 + 1.5 = 4 hours

75. (c) Total distance 60 km/hr × 1 hour = 60 hour
Therefore,
→ Time will be taken by another car to travel the same distance with 40 km/hr
$\frac{60}{40}$ → $\frac{3}{2}$ hr.

76. (c) Method.

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→ Time = $\frac{Distance}{Speed}$

→ 10 = $\frac{50+100}{speed}$ → Speed = 150/10

→ Train's speed = 15 m/s

77. (a) Here length of pole is considered 0 meter

→ Time will be taken by train to cross the poll

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

Required time = 20 seconds

78. (c) Total distance = Speed × Time

= 55 km /h × 4 hours

= 220 kms

→ New speed after increasing = 55+ 5 = 60 kmph

→ Time taken with new speed = $\frac{220}{60km/h}$

= $3\frac{3}{6}$ hr = 3 hour + $\frac{3}{2}$ × 60 min

= 3 hours + 40 min.

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

79. (a) We know that,

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

So, 45 km/hr = 45 × $\frac{5}{18}$m/s = 12.5 m/s

80. (a) Distance covered in 1 min = 50m

Distance covered in 2 min = 90m

Similarly, 1st min IInd III rd. min ..... 15th min

Distance → 50m + 90m + 130m + ...

By using AP

a = 50m, d = (90 - 50) = 40 m

Tn = a + (n - 1)d

= 50 + (15 - 1) × 40

= 50 + 560

= 610 m

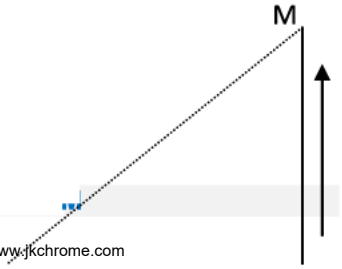
81. (d) According to the question,

→ Using Pythagoras theorem

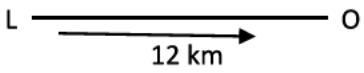
→ $(ML)^2 = (MO)^2 + (LO)^2$

→ $(ML)^2 = (12)^2 + 5^2$

→ ML = 13 km



5 km



82. (d) Given

→ Speed of train = 75 km/hr

→ Distance that is to cover = 1050 km

→ Time taken by train to cover the distance =

$Time = \frac{Distance}{S\,peed}$

Time = 350/25

Time = 14 hours

83. (c) We know that

→ 1m/s = $\frac{18}{5}$ km/h

→ 1 km/h = $\frac{5}{18}$ m/s

→ 90 km/h = 90 × $\frac{5}{18}$ m/s

Speed = 25 m/s

→ Time taken by train to pass a post

→ Time = $\frac{Distance}{Speed}$

→ $Time = \frac{180meters}{25m/s}$

→ $Time = 7.2\,second$

84. (b) We know, 1 km = 1000 meter

→ 2 km 5 meter = 2 km 5 meter

= 2km + $\frac{5}{1000}$ km

= 2 km + 0.005 km

= 2.005 km

85. (a) Let the required time = x second

According to the question,

Time = $Total\frac{distance}{Speed}$

x = $\frac{Length\ of\ traini+length\ of\ bridge}{Speed}$

→ x = $\frac{(120+360)\text{meters}}{36\times\frac{5}{18}}$

[Thus, 1 km = $\frac{5}{18}\,mts$]

→ x = $\frac{48\,meters}{10\,meters}$ → x = 48 sec

→ Required time = 48 seconds

86. (c) Circumference of Wheel = 2 πr

→ $2\times\frac{22}{7}\times\frac{70}{2}$ = 220 cm

Speed per hour

= $\frac{220\times400\times60}{1000\times100}$ = 52.8 km/h

87. (a) Let the length of train B l meter

→while crossing a pole

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→ 20 = $\frac{1}{Speed\ of\ train}$

→ Speed of train = $\frac{l}{20}$ min. ..... (i)

→ Again while train crosses plateform

→ 45 = $\frac{l+Plateformlength}{Speed\ of\ train}$

→ 45 = $\frac{l+250}{speed}$

→ Speed = $\frac{l+250}{45}$ ..... (ii)

Equation (i) and (ii)

→ $\frac{1}{20}$ = $\frac{l+250}{45}$

→ $\frac{l}{4}$ = $1+\frac{250}{9}$

→ 9l =4ll+ 100

5l = 1000

→ Length = 200 mt.

88. (c) As we know

→ m/s = 18/5 km/hr

→ 20 m/s = $\frac{18}{5}$ × 20 km/hr

= 72 km/hr

89. (a) Let the length of train be l meter

According to the question

time = $\frac{Distance}{Speed}$ → 100 = $\frac{500+l}{Speed\ of\ train}$

→ Speed = $\frac{500+l}{100}$ .....(i)

Again,

60 = $\frac{250+l}{Speed\ of\ train}$

Speed = $\frac{250+l}{60}$

Equation (i) and (ii)

→ $\frac{500+l}{100}$ = $\frac{250+l}{100}$

→ 1500 + 3 l = 1250 + 5 l

→ 2 l = 250

→ Length of train = 125 m

90. (c) Speed = $\frac{Distance}{time}$

Speed = 250/50 5 m/s

Speed = 5 × $\frac{18}{5}$ = 18 km/hr

91. (d) Circumference of circle = 2 π r

= 2 × $\frac{22}{7}$ × 42

= 264 cm,

Distance cover in 1 sec

= 264 × 5 = 1320 m/s

92. (b) According to first situation total distance covered by man = Speed × Time

= 4 km/hr × (2 hr. + 45 min)

= 4 km/hr × (2 + $\frac{45}{60}$)

= 4x ($2\frac{3}{4}$) = 4 × $\frac{11}{4}$

Total distance = 11 km

→ time will be taken by man with speed of 16.5 km/hr to cover a distance of 11 km

= time = Distance/ Speed

→ Time = $\frac{11km}{16.5\ km/h}$

= $\frac{11}{33}$ × 2 = $\frac{2}{3}$ hours = $\frac{2}{3}$ × 60 min

time = 40 min

93. (b) Total stops will be taken by the man to cover a distance of 90 km is

= $\frac{90}{7}$ → 12 stop + 6 km

→ 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 stop = 90/18 = 5 hours

Total time to cover total distance = 5 hours + 1 hour 12 min = 6 hour 12 min

94. (c) Let speed of Romita be x km

ATQ

4 km/h x km/h

Anita Romita

R d = 42 S

t = 6h

(4 + x) = 42/6 (X = $\frac{d}{t}$)

4 +x = 7

x = 3 km/h

95. (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.

96. (c) ← 330 km →

8 am →

60 km/hr

← 330 km →

8 am → ← 9 am

60 km/hr 75 km/hr

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T = $\frac{270}{60+70}$ = 2 hrs
So, time at which they meet = 11:00

97. (b) Relative speed = 5 + 5 = 10 m/min
Total time taken to meed each other
= 1200/10
= 120 minutes

98. (b) $V_{rel.}$ = 63 – 3 = 60 km/hr
T = $\frac{500\times18}{60\times5}$ sec.. = 30 sec
Required time = 30 sec.

99. (a)

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

100. (b) $V_{rel.}$ = 7 + 67 = 144 km/hr
= 144 × 5/8 m/sec. = 40 m/sec
T = $\frac{D}{V_{rel.}}$ = $140+\frac{160}{40}$ = $\frac{300}{40}$ = 7.5 sec.

101. (c) $V_{rel.}$ = $\frac{2\times120}{T}$ = $\frac{240}{12}$ = 220 m/sec
$V_{rel.}$ = $V_1 + V_2$ = 2V = 20 m/sec
So, V = 10 m/sec. = 10 × $\frac{18}{5}$ km/hr
= 36 km/hr

102. (b) $V_{rel.}$ = $V_1 + V_2$ = $\frac{D}{T}$ = $\frac{154}{0.4168\times60}$ m/sec = 22 km/hr
So, V_1 = 22 + 30 = 52km

103. (a) $V_{rel.}$ = (21 - 15) m/min = 6 m/min
Time taken to catch the thief
= 114/6 min = 19 min

104. (a) Time taken by A
= 252 sec. = $2^2 \times 3^3 \times 7$
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 Requird time (min.) = (4 × 9 × 7 × 11)/60
= 46 min. 12 sec.

105. (b) T = $\frac{D}{T}$ = $\frac{l1+l2}{S1+S2}$ = $\frac{300}{\frac{100\times5}{18}}$
$\frac{300\times18}{500}$ → T = 54/5 = 10.88 sec.

106. (c) S1 = $\frac{120}{10}$ m/sec. = 12 m/sec.
S2 = 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.

107. (d) Total distance covered by both trains
= 50 m + 75 m
and their relative speed in same direction
= 68 kms - 50 kms = 18 kms
Thus, (Speed substarcted in same direction)
then, the corossing time of each other will be
= $\frac{125\frac{m}{s}}{18\ kms}$
= $\frac{125\times18}{18\times5}$ = [Thus, 1 km/h = 5/18 m/s
= 25 second
Alternate:
Crossing of each other in same direction will be
= $\frac{l1+l2}{(S1+S2)\times5/18}$
Second = $\frac{50+75}{(68-50)\times5/18}$
= 125/ 18 × 18/5
= 25 second

108. (b) The distance which will be convered by the constable to catch the thieves = 200 meters.
Their relative speed in same direction 8 km/h - 7 km/hr = 1 km/hr
= $\frac{5}{18}$ m/s
= {Thus, 1 km/h = $\frac{5}{18}$ m/s}
(i.e Constable reaches 5 near the theives in every 18 second with Realtive speed)
Then the Required tim
= $Distance/Speed$ = $\frac{\frac{200meter}{5}}{18}m/s$ = 200/5 18 second
= 720 second = 720/60 minutes
{Thus, 1 m = 60 second} = 12 minutes

109. (d) In this question it is given that A man who sits in the solower train cross the faster train it means faster trains cross the man in 18 second
→ Relative speed of faster train and man in the sam direction
= 58 – 30 = 28 kmph

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So distance covered by faster train in 18 seconds
= 28 kmph × 18 second
= 28 × 5/18 × 18 = 140 meters

110. (d) Thus, Distance = Time × Speed
→ A Coveres the distance with the uniform rate of 4 km/hr in 4 hours is
= 4 × 4 = 16 km
→ B's Speed = 10km/hr
→ Their relaive speed on same direction = (10 - 4) kmph
→ 6 km/h
→ After 4 hours, B will cover the distance with Relative speed 6 km Per hour
then 16 km, will be covered by B in = $\frac{16\ km}{6\ k/h}$
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/j = 2.67 × 10 = 26.7
→ So, B will cover 26.7 km from starting point

111. (c) A train passes two person who are walking in the same direction in this ways: -
11 second → 5 km/h = 11 × 5 = 55 ..... (i)
10 second → 3km/h = 10 × 3 = 30 ..... (ii)

$$\frac{1\ \text{second}}{25}$$

$= \frac{25}{1}$ = 25 km/hr
Speed of the train is 25 km/h
Note: Products of time × Speed is always subtracted if both the men is running in the same direction and the products of time × speed is added only if the men are running direction.
→ Here train's direction is not considered.
But attention please → Always divided by the 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 x 10 sec. (Dis. = Time × Speed) ..... (i)
→ Distance, covered by the train in 11 second in respect of the second man = (x - 5)km/h × 11 sec.
Thus, Length of the train is equal
So, Here we can (i) = (ii)
(x - 3) km/h × 10 sec = (x - 5) h × 11 sec.
10 x - 30 = 11x - 55
11x – 10x = 55 – 30
x = 25 km/h

112. (a) Relative speed = 60 + 50 = 110 km/h
Time taken = 210/110 = 2 hr.

113. (b) Let the length of both of trains = l meter (equal)
speed of first train = S_1 m/s
and another's speed = S_2 m/s
ATQ
→ $\frac{l}{S_1} = 3$ → $S_1 = \frac{l}{3}$ ..... (i)
Again, → $\frac{l}{S_2} = 4$ → $S_2 = l/4$ ..... (ii)
→ Crossing time in opposite direction to each other.

$$= \frac{Total\ Distanc}{Total\ Speed} = \frac{l+l}{\frac{l}{3}+\frac{l}{4}} = \frac{2l}{7l} \times 12$$

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

114. (b) We know that, When two trains cross each other in opposite direction then they cover the distance equal to length of both trains. And in opposite direction their speed is added.
So, the Timewhich they take to cross each other in opposite direction is = $\frac{TotalDistance}{Speed}$ = $(\frac{105+90}{45+72})$
Opp. Driection
→ $(\frac{195\times18}{117\times5}) = \frac{115}{9} \times \frac{18}{5}$ (by 13)
→ 6 second

115. (c) When a faster train crosses the man who sits in the other train, on that time faster train covers the distance equal to its lengthbut the relative speed (Opposite/same driection) is considered in respect of man.
Relative Speed of the trains = (56 - 29)km/h = 27 km/h
Length of faster train = Distance covered by faster train in 10 second with Relative speed of 27 km/h = 27 km/h × 10 sec.
= $27 \times \frac{5}{18} \times 10$ m.
= 75 meters

116. (a) Let the length fo the trains = l meters (equal) and the speed of the first train is a S_1 m/s and

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another is S_2 m/s

for first time → $\frac{l}{S_1}$ = 18

S_1 = l/18 m/s ..... (i)

for second train → $\frac{l}{S_2}$ = 12

$S_2 = \frac{l}{12}$ m/s ..... (ii)

time, taken by trains to cross each other in opposite direction

$= \frac{Total\ Distance}{Total\ Speed(Opposite\ direction)}$

$= \frac{l+l}{\frac{l}{18}+\frac{l}{12}} = \frac{2l}{5l} \times 36$

Time 14.4 seconds

117. (d) Speed of first train = $\frac{150}{15}$ = 10 m/s

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

→ Relative speed of two trains

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

→ Speed of second train = (25 - 10) × $\frac{5}{18}$ = 25 m/s

→ Speed of second train = (25 - 10)× 18/5 = 54 km/hr

118. (d) Relative speed of the two trains

= (48 + 42) × 5/18 = 25 m/s

→ Distance travelled in 12 sec. at 25 m/s = 25 × 12 = 300

→ Length of first train = 300 × 2/3 = 200m

Distance travelled by first train in 45 seconds

= 48 × 5/18 × 45 = 600m

→ Length of platform = 600 – 200 = 400 meters

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

Their relative speed in same direction = (45 - x) km/h, Here (45 - x) has gbeen written because bus crosses the truck which is running 150 meters ahead from it. i.e. Truck speed will be lower than that of bus.

According to the question,

time = $Total\ \frac{distance}{Total\ Speed}$

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

$= \frac{150\times18}{(45-x)\times45} = 30$

= x = 27 km/h

So, speed of the truck is 27 km/h

120. (d) Their relative speed in same direction

= 36 – 9 = 27 km/h

→ Time, Taken by train to cross the man = 150/27

[Distance/Speed = Time]

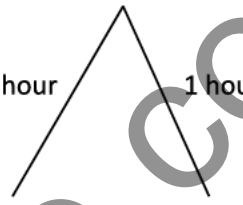
→ Time = $\frac{150}{27\times\frac{5}{18}}$

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

→ Time = $\frac{30\times2}{3}$

Time = 20 second

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



80 kmph 80 kmph

→ Total Distance = 80 × 2

→ 160 km

→ Total time = 1 + 1

→ 2 hours

→ Any Speed

$= \frac{Total\ Distanc}{Total\ Time} = \frac{160}{2}$

Avg. Speed = 80 kmph

Altenate:

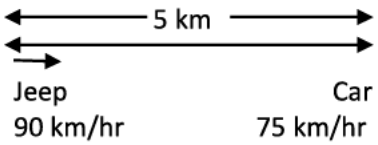
Average Speed = $S_1S_2/S_1 + S_2$

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

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

Average Speed = 80 kmph

122. (b)



→ their relative speed in same direction = (90 - 75) → 15 kmph

→ Time taken by jeep to overtake car

= 5/15 = 1/3 hour = 1/3 ×60 min

= 20 min

123. (c)

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

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→ Here, 4 units → 20 kmph
→ 1 unit → 5 kmph
thus, Speedo of the man = 1 unit
Thus, Speed of the man = 1 × 5 = 5 kmph

124. (d) Let the speed of train = x km/hr
→ Length of train = 300 meters
→ Their relative speed in same direction = (x - 3) km/hr
→ According to the question,

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

[Here man's length is 0 meter]

$$\rightarrow \frac{300\times18}{5x-15} = 11$$

→ 1800 = 55x – 165
→ 55x = 1965
→ Speed of train = 1965/55

125. (c) Let the speedo of train =x km/hr
Given,
Length of train = 240 meters
Speed of man = 3 km/hr
ATQ
Their
Relative speed in opposite direction = (x + 3) km/hr
(Speed is added in opposite direction so = (x + 3)

$$\rightarrow \frac{(240+x)meter}{(x+3)\times\frac{5}{18}m/s} = 10 \text{ sec.}$$

{man's length is 0 meter}

$$= \frac{240\times18}{(x+3)\times\frac{5}{18}m/s} = 10 \text{ sec.}$$

→ 432 = 5x + 15
→ 5x = 417
→ Speed of the train = 417/5 = 83.4 km/hr

126. (c) If trains are running on parallel tracks in opposite direcdtion, their speed is added → Relative speed in oppotite direction = (68 + 40)
→ 108 kmph
ATQ
→ Time taken by trains to cross each other = (70 + 80)meter/108 km/hr
Time = Distance/Speed → $\frac{150}{108\times\frac{5}{18}}$

$\frac{150}{30}$ = 5 sec.
Therefore corssing time in oppotite dirction = = 5 seconds

127. (c) According to question (124) explaination

Crossing time = $\frac{(137+163)meters}{(42+48)kmph}$

Crossing time = $\frac{300}{90\times\frac{5}{18}}$ = 12 sec.

Therefore cossing time to each other direction is = 12 sec.

128. (d)Given:
Speed of the trainare 25 km/hr and 35 km/hr
Length of fist train = 80 meters
Length of second train = 120 meters
Their relative speed in same direction (speed is subtract in the same direction) = (35 - 25) = 10 km/hr
Time, taken by train to cross each other in same direction on parallel tracks =

$$\frac{Total\ distance}{Relative\ speed\ in\ same\ direction}$$

$$\rightarrow \left(\frac{(80+120)meters}{10km/hr}\right.$$

$$\rightarrow \frac{200meter}{10\times\frac{\frac{5}{18}m}{s}}$$

[1 km/hr = $\frac{5}{18}$ m/s]
→ Crossing time = 72 sec.

129. (a) Raletive speed of man & train

$$= \frac{100\times5}{36}\times\frac{18}{5} = 50 \text{ km/hr}$$

= Speed of train
= 50 – 5 = 45 km/hr

130. (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,

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

$2l = \frac{25}{9}\times 36 = l = 50$ m
Length of each train = 50 m

131. (c) Relaative speed = $(45-40)\times\frac{5}{18}$

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

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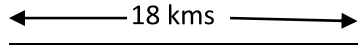
Required distance = $\frac{25}{18}$ × 45 × 60
= 3750 meters or 3.75 km

132. (b) Let the speed of the cars be S_1 and S_2
$= S_1 - S_2 = \frac{70}{7} = 10$ ..... (i)

and $S_1 + S_2 = 70/1 = 70$ ..... (ii)
from equation (i) and (ii)
$S_1 = \frac{10+70}{2}$ = 40 km/hr
$S_2 = \frac{70-10}{2} = 30\ km/hr$
= Required speeds are 40 km/hr and 30 km/hr

133. (b) Relative speed = 24 – 18 = 6 km/hr
Time reequired by faster train to cover take slower train = $\frac{27}{6}$
= Distancne between Q and R = 18 × $4\frac{1}{2} = 81\ km$

134. (a)



$2\frac{1}{2}$ km/hr 2 km/hr
Their relative speed in opposite =
$2\frac{1}{2}$ km/hr + 2 km/hr
$= 4\frac{1}{2}\ km/hr$
→ Time taken by them to cover a distance of 18 kms is = $\frac{18}{\frac{9}{2}}$ = 4 h
{Time = Distance/ speed}

135. (c) Time taken by them to cross each other = $\frac{l+l}{\text{Relative speed in oppo.direction}}$
Time = $\frac{108+112}{45+54\times5/18} = \frac{220\times18}{99\times5}$
Time = 8 second

136. (a) Let the speed of second trains = x km/hr
→ Their relative speed in opposite direction = (43.2 + x) = km/hr
→ According to question,
→ Time = $\frac{l_1+l_2}{\text{Speed}}$
→ 10 sec. = $\frac{(150+220)\text{m}}{43.2+x\times\frac{5}{18}\text{m/s}}$
→ 10 = $\frac{270\times18}{(4.2+x)\times5}$
→ 43.2 × 5 + 5x = 486
→ x = $\frac{486-216}{5}$
→ Speed of second train = 54 km/hr

137. (b) Let the speed of second train is = x km/hr
→ Time = $\frac{l_1 l_2}{\text{Relative speed in oppo.direcdtion}}$
→ $\frac{125+125}{65+x\times(\frac{5}{18})}$
→ 6 = $\frac{250\times18}{(65+x)\times\frac{5}{18}}$
→ 6 = $\frac{250\times18}{(65+x)\times5}$ → 65 + x = 50 × 3

138. (c) Total distance covered by man in (1.30 pm - 10 am) =
$3\frac{1}{2}$ hour at a speed of 12 km/hr
= 12 × $3\frac{1}{2}$ = 42 km.
→ Time taken by his elder brother to catch him = $3\frac{1}{2}$ hour - 1 hour 15 min.
→ Brother's time = 3 hr 30 min - 1 hr. 15 min
= 2 hr 15 min
= $2\frac{15}{60} = 2\frac{1}{4}$ → $\frac{5}{4}$
→ Brother's speed = $\frac{42}{\frac{9}{4}}$
[$Speed = \frac{Distance}{Time}$] = $18\frac{2}{3}km$

139. (b) Their relative speed in same direcdtion = 1 km/8min - 1 km/10 min
= $\frac{1000meter}{8\ min} - \frac{1000\ meter}{10\ min}$
→ 1000 × $\frac{10-8}{10\times8}$
→ $\frac{1000\times2\ meter}{80\ min}$
→ 200 meter/ 8 min
→ Time taken by police man to over take the thief a the exceeds relative speed of 200 meter/8min
→ $\frac{100meter}{\frac{200\ meter}{8\ min}}$ → 4 min
→ Distance covered by theif before overtake = $\frac{1000\ meter}{10\ min}$ × 4 min
= 400 meter

140. (c) The fast train completely passes a man sitting in the slow train, in this condition it covers equal distance to its length.
→ Relative speed in same direction(40 - 20)

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= 20 km/h

→ Therefore, length of the train = Speed × Time = 20 km /hr × 5 sec.

= $20 \times \frac{5}{18}$m/s × 5 sec

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

141. (b) Time takenn 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

142. (a) Let their lengths are = l meter

→ Relative speed in same direction = (90 - 60) = 30 km/hr

$$\rightarrow \text{Time} = \frac{\text{Distance}}{\text{Relative speed in same direction}}$$

$$\rightarrow 30 \text{ sec.} = \frac{l_1 + l_2}{30\frac{5}{18}\text{m/s}}$$

$$\rightarrow 30 = \frac{2l\times18}{30\times5}$$

→ Length of each train = 125 meters

143. (c) Time taken by trains to cross each other in oppo direction

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

$$= \frac{(125+115)\text{meter}}{(33+39)\times\frac{5}{18}\text{m/s}}$$

$$= \frac{240\times18}{72\times5}$$

Time = 12 second

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

= $40 \times \frac{1}{2}$ = 20 kms.

→ Their relative speed in same direction = (50 - 40) = 10 km/hr

→ According to question,

→ 20 km, is the distance that has to cover by owner to over take the thief.

$$\rightarrow \text{Required time} = \frac{20\text{km}}{10 \text{ relative speed}} = 2$$

hours

→ Therefore, he will overtake the thief at

= 2 pm + 2 hr

= 4 pm.

145. (b) Let the speed of first train is s_1 km/hr and speed of second train is s_2 km/hr

→ From method

Time =

$$(Total\ distance)/(Relative\ speed\ in\ same\ opp.direction)$$

→ In the same direction

$$\rightarrow 27 \text{ sec} = \frac{100+95}{(S_1 - S_{2)\times\frac{5}{18}}}$$

$$\rightarrow 27 = \frac{100+95}{(S_1 - S_{2)\times5}}$$

$= s_1 - s_2 = 26$ ..... (i)

In the oppo. direction,

From equation (i) and (ii)

$\rightarrow s_1 - s_2 = 26$

$\rightarrow s_1 + s_2 = 78$

$\rightarrow S_1 = \frac{26+78}{2} \rightarrow S_1 = \frac{104}{2}$

$\rightarrow S_1 = 52$ km/hr and $S_2 = 26$ km/hr

146. (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 overtake P

$= \frac{15}{10} \rightarrow 3/2$ hours

147. (c) Let length of train = l meter

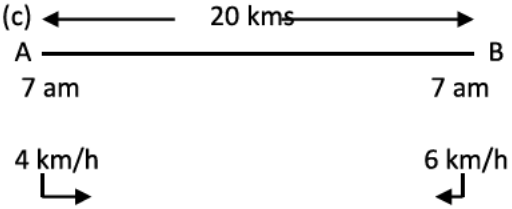
→ Time

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

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

$$\rightarrow 4 = \frac{l}{90\times\frac{5}{18}} \rightarrow 1 = 100\text{m}$$

148. (c)



Their relative speed in opp. direction

= 4 + 6 = 10 km/hr

$$\rightarrow \text{Time} = \frac{10km/hr}{10\ km/hr} = 2 \text{ hours}$$

→ Meeting time = 7 am + 2 hr. = 9 am

149. (a) Let the lengths of trains = l meter (equal)

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→ Relative speed in the same direction = 46 – 36 = 10 kmph

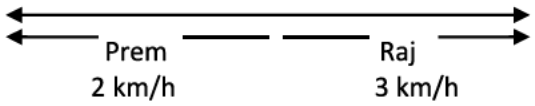
[Time = Distance/ speed]

→ 36 sec = $\frac{(l+l)meter}{10\times\frac{5}{18}m/s}$

→ 36 = $\frac{2l\times18}{50}$

→ Length = 50 meters

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



→ Therefore distance between Raj and Pren after 2 hours

= 2 × 5 = 10 km (Distance = Speed × Time)

→ Therefore distance between Raj and Prem after 2 hours

= 2 × 5 = 10 km (Distance = Speed × Time)

151. (a) Let the length of first train = l meter

→ and another = l_2

Speed of the first train = $\frac{150m}{80s}$ = 5 m/s

Case - 2

10 = $\frac{(150+150)meter}{Speed\ of\ 2nd\ train+5m/s}$

= S_2 = 25 m/s

Speed of the second train = 25 m/s

= 25 × 18/5 km/h [Thus, 1 m/s = $\frac{18}{5}$ k/h]

= 90 km/hr

152. (a) (50 + 58) × $\frac{5}{18}$ = $\frac{150+180}{Time}$

Time = $\frac{330\times18}{108\times5}$

Time = 11 second

153. (b) Avg. speed = $\frac{Total\ distance}{Total\ time}$

= $\frac{10+12}{\frac{10}{12}+\frac{12}{10}}$ = 10.8 km/h

154. (b) Avg. speed

= $\frac{Total\ distance}{Total\ time}$

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

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

155. (b) Thus, Distance = Speed × time

→ Distance covered by the train with the speed of 30 kmph in 12 minute is = $30\times\frac{12}{36}$

= 6 km

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

= 45 × 8/60 = 6 km

Average Speed = $\frac{Total\ distance}{Total\ time}$

→ $\frac{6+6\ km.}{12+8\ min}$ = 12/20 × 60

= 36 kmph

156. (b) Let total distance = d km

According to question,

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

→ $\frac{d}{80}+\frac{d}{120}$ =10

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

→ d = $\frac{2400}{5}$ → d =480 km

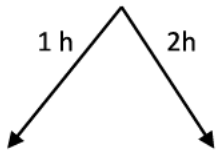
Alternate:

Average Speed = $\frac{2xy}{x+y}$ = $\frac{2\times40\times60}{100}$ = 48 km/hr

Distance = S ×T = 48 × 10

= 480 km.

157. (c) ½ journey 6 km (half)



6 km/h 3 km/h

Total journey = 6 × 2 = 12 kms.

Total time = 1 + 2 = 3 hr

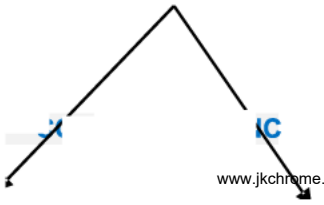
Average speed = 12/3 = 4 km/h

Alternate:

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

= $\frac{2\times6\times3}{6+3}$ = $\frac{36}{9}$ = 4 km/h

158. (c) 12 km(one side distance)



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1h 3h

12 km/h 4 km/h

Total distance = 12 × 2 = 24 km

Total time = 1 + 3 = 4 hours

Average speed = 24/4 = 6 km/h

Alternate:

Average speed =

$$\frac{2\,s_1 2}{s_1 + s_2}$$

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

Average speed = 6 km/h

159. (a) Given:

Train covers 3584 kms in 2 day 8 hor (2 days 8 hours $= \frac{7}{3}\ days$)

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

= 1536 km/ day → $1536/24$ = 64 km/h

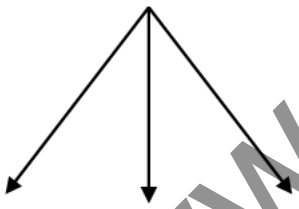
Distance covered in two days = 1440 + 1608 = 3048 km

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

third day 536 km is covered in 8 hour with speed of = 536/8 = 67 km/h

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

160. (a) Let 10% of Journey = 40 (LCM)



20 km/h 40km/h 10 km/h

→ 10% of Journey's = 40 km

→ Then total Journey = 400 kms

→ Average speed

$$= \frac{Total\ distance}{Total\ time}$$

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

= 120 km

60% of journey = $400 \times 60/100$

= 240 km

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

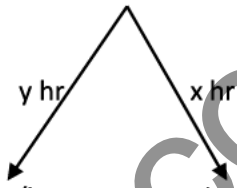
$$\rightarrow \frac{400}{\frac{120}{20}+\frac{240}{40}+\frac{40}{10}}$$

→ Average s[eed = $\frac{400}{6+6+4}$

→ Average speed = $\frac{400}{16}$

→ Average speed = 25 km/hour

161. (b) x y (one distance)



x km/hr y km/hr

→ Total distance = 2xy km

→ Total time = (x + y) hours

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

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

162. (a) According to question (127) explaination

→ Average speed = $\frac{2xy}{x+y}$

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

Avg. speed = 48 km/hr

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

$$= \frac{2\times12\times18}{12+18} \rightarrow 14\frac{2}{5}km/hr$$

164. (a) 36 × 45

(one side jouney)

36 km/hr 45 km/hr

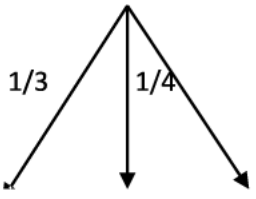
→ Avg. speed = $\frac{Total\ distnace}{Total\ time}$

$$= \frac{2\times36\times45}{45+36} = \frac{3150}{81}$$

Avg. speed = 40 km/hr

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

1200



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400 300 500

Total time taken

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

16 + 10 + 10 = 36 hours

Average speed = $\frac{Total\ distnace}{Total\ time}$

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

166. (a) Let the distance between Allahabad and Nagpur = 300 km

total time taken = $\frac{300}{100} + \frac{300}{150} = 5\ hr$

Average speed = $\frac{300+300}{5}$ = 120 km/hr

Alternate: Average Speed

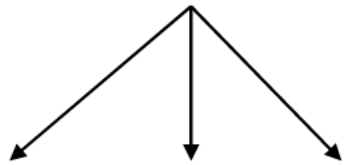
$\frac{2xy}{x+y} = \frac{2\times150\times100}{250}$ = 120 km/hr

167. (b) Total distance = 6 × 5 + 3 × 6 = 48 km

Total time = 6 + 3 = 9 hrs

= Average Speed = $\frac{48}{9}\ km/h$

168. (c) 60 LCM

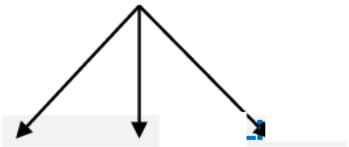


10 km/h 20 km/h 60 km/h

→ Avg. speed = $\frac{Distance}{Time}$

$= \frac{60\times3}{\frac{60}{10}+\frac{60}{20}+\frac{60}{60}} = \frac{180km}{(6+3+1)hour}$ → Average speed = 18 km/hr

169. (b) 200 km(LCM)



50 km/h 40 km/h 20 km/h

→ To avoid the calculation problem we let here small part of the journey = 200 km.

→ Remaining part = 40% + 50% = 90%

→ (100 - 90) = 10%

i.e. 10% of journey = 200

Total journey = 2000 kms

→ Avg. Speed = $\frac{Distance}{Time}$

$= \frac{2000}{\frac{1000}{50}+\frac{800}{40}+\frac{200}{20}}$

Total Journey = 2000

50% = 1000 km

40% = 800 km

10% = 200 km

→ $\frac{2000}{20+20+10}$ → $\frac{200}{50}$

Avg. Speed = 40 km/h

170. (d) Avg. speed for whole Journey

$= \frac{2\ S_1S_1}{S_1+S_1}$

$= \frac{2\times20\times30}{20+30}$

$= \frac{2\times20\times30}{50}$

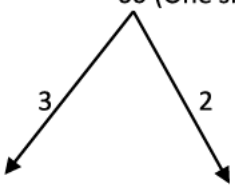
Avg. Speed = 24 km/hr

171. (c) Average speed of train = $\frac{2\ S_1S_1}{S_1+S_1} = \frac{2\times20\times30}{30+20}$

Avg. Speed = 24 km/h

Alternate:

60 (One side distance)



3 2

20 km/hr 30 km/hr

→ Total distance = 60 × 2 = 120 km

→ Total time = 3 + 2 = 5 hour

→ Avg Speed = 120/5

[Speed = $\frac{Distance}{speed}$]

= 24 km/hr

172. (d) Let distance be 60 km

(LCM of 10, 20, 30 & 60)

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

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Total time = $\frac{60\ km}{10\ km/h} + \frac{60\ km}{20\ km/h} + \frac{60\ km}{30\ km/h} + \frac{60\ km}{60\ km/h}$

= 6 + 3 + 2 + 1 = 12 hrs

Average Speed = $\frac{(60+60+60+60)}{12} = \frac{240}{12}$

= 20 km/hrs

Note: If we do it by talking 7 km, our answer will remain same, because average speed will same irrespective to distance

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

= 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

174. (c)

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

4R – 3R = 1R = 30 min

So, 4R = 30 × 4 = 120 min

Requiired time = 2 hrs

175. (c)

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

(5 - 4)R = 15 min

R = 15 min

So, time taken by B = 4 1 15 = 1 hr.

Distance = S × T = 50 × 1 = 50 km

176. (a)

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

1 hour more

= 60 min

It is given that A takes 20 minutes more than B's.

i.e. 1 units → 20 min

1 units → 20/60 = 1/3 hr

then A's time to reach the destination = 4 units

= 4 × $\frac{1}{3} = \frac{4}{3}$hr.

177. (b) Given : -

A's speed = 9 km/hr

B's speed = 10 km/hr

	A	:	B	
Ratio of speed =	9		10	[Speed $\propto \frac{1}{Time}$]
Ratio of time =	10		8	

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 = 36/60 = 3/5

→ Their travelled distance is same

→ Distance = Time × Speed

= 9 × 10

= 90 ratio

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

178. (b) Let his usual upeed = 4x

Let speed = 3x

	Usual	:	Late
Their Ratio of speed =	4	:	3
Their ratio of time =	3	:	4

[Speed $\propto \frac{1}{Time}$]

1 Minute late

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

→ i.e. 1 unit = 20 minutes

→ Therefore,

The usual time taken by him tol reach his office

= 3 × 20

Usual time = 60 minutes

Alternate: -

$\left[\frac{Late\ speed}{usual\ speed - late\ speed} \times late\ time\right]$

→ Usual time = $\frac{3}{4-3} \times 20$

→ 60 minutes

179. (a)

	Actual	New
Speed	4	3
Time	3	4

1 → 3/2

Normal time = 3 × $\frac{3}{2} = \frac{9}{2}$ hrs

180. (a)

	Actual	:	New
Speed	7	:	7
Time	6	:	7

1 unit → 25 minutes

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6 unit → 150 minutes

= usual time = 2 hours 30 minutes

181. (b) Actual : New

Speed 7 : 6

time 6 : 7

1 unit → 12 minutes

6 units → 72 minutes

= usual time = 1 hours 12 minutes

182. (c)

Speed 4 3

Time 3 4

1 unit → ½

4 units → 2hr

= Distance = 3 × 2 = 6 km

183. (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 → 1 hr. 15 min

1 units → $1\frac{1}{4}$ hr

6 units → $7\frac{1}{2}$ hr

B reached the destination in 7 hours 30 minutes

184. (a) Actual : Reduced

Ratio of speed = 3 : 2

Ratio of time = 2 : 3

R =1 hrs

Actual time taken = 2 × 1 = 1 hrs

185. (c) Acctual : Reduced

Ratio of speed = 11 : 7

Ratio of time = 7 : 11

Given, 11R = 22 hours

R = 2 hours

Actual time i.e. 7 R = 14 hrs

So, time saved = 22 – 14 = 8 hrs

186. (c) Actual : Reduced

Ratio of speed = 5 : 3

Ratio of time = 3 : 5

Given, 2 Ratio = 5/2 hr

R = 5/4 hr.

Usual time = $\frac{3\times5}{4}$ = $3\frac{3}{4}$ hr

187. (b) Usual speed : New speed

7 : 5

× 5 × 5

35 km/h : 25

Thus, train covers 42 kms in 1 hour, 40 min, 48 second with th speed of 5/7 of its usual speed

then its new speed = $\frac{Distance}{time}$

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

1 houur 40 min 48 second

1 h + 40 min + $\frac{48}{60} min$

1 h + (40 + $\frac{4}{5}$) min

1 h + $\frac{204}{5}$ min

(1 + $\frac{204}{5\times60}$) h = $\frac{504}{300} h$

= 42/504 × 300 km/h

= 25 km/h

Thus, 5 units = 25 km/hr

1 unit = 5 km/hr

Thus, Usual speed = (7 × 5) = 35 km/h

188. (c) Usual : New

Ratio of speed → 4 : 3

Ratio of time → 3 ; 4

1 unit late (more)

[Speed = $\propto \frac{1}{time}$]

It is given that he takes 2 hours more that the usual time t.e.

1 unit = 2 hours

3 units = 3 × 2 = 6 hour

So, the usual time, taken by man to cover the distance = 6 hours

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

Ratio of distance = 40 : 50 = 4 : 5

→ Fro the cars not to collide $V_1 : V_2 \neq 4 : 5$

190. (d) Let the total Journey is 3/8, 5/6

LCM = 24 km

→ At 11:00 am, man covers 3/8 of the whole journey i.e.

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

→ At 4:30 pm, man covers 5/6 of the whole journey i.e. = 24 × 5/6 = 24 km

→ i.e. man covers (20 - 9) = 11 km in (4.30 pm – 11 am) = 11/2 hour

So, the spedd of the man = $\frac{11km}{\frac{11}{2}km/h}$

or taken by the man to cover = 9

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

When the starting time of thejourney is

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

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191. (d) ATQ

Ratio of A, B and C's speed is

A : B : C

2 : 1

3 : 1

A : B : C

2 : 1 : 1

× × ×

6 : 3 : 1

	A		B		C
Ratio of speed →	6	:	3	:	1
Ratio of time →	1	:	2	:	6
	↓ × 12				↓ × 12
	12 min				72 min

C covers this distance in 72 min

6 units → 72 min

1 unit → 12 min

So, time taken by A = 12 min

192. (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

193. (b) They meed after 6 hours if they walk towards each other i.e. their speed will be added

Thus So their relative speed in opposite direction

$=\frac{Distance}{Time}$ 60/6

→ Relative speed opposite direction

= 10 km/h ..... (i)

→ According to question: -

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

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

A + 3B = 18

→ B's speed = $\frac{P(18-A)}{3}$ = 10

→ 3A + 18 – A = 30

→ 2A = 12

→ A's Speed = 6km/h

194. (a) A B C

2 1

3 1

A : B : C

Ratio of speed	6	3	1
Ratio of time	1	2	6
	↓ ×19		↓ × 19
	19 min		114 min

= A will take 19 minutes

195. (a) In these type of question go though options to save your valuable time

Option (a) : Abhay's speed = 5 km/hr

Sameer's time = 6 – 2 = 4 km

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

Hence, option (a) is correct as at satisfies all condition

196. (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 = 180/2 = 90 km/h

Required difference

= 90 – $\frac{120}{2}$ = 30 km/hr

So, Increase speed = 30 km/hr

197. (b) Before 10 am distance covered by first train which is running from town A = 70 × 2 = 140 km(10 am)

Remaining distance = 500 – 140 = 360 km

Here, 360 kms is the distance which will be covered by both trains with their Relative speed in opposite direction.

Their relaive speed in opposite = (7 + 100) = 180 kmph

ATQ

Time taken by both trains to cover 360 km, is

= $\frac{360}{180}$ = 2 hours

After 2 hours they will meet each other and their meeting time will be = 10 am + 2hr

= 12 noon

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

= $\frac{2\times12\times18}{12+18}$ → $14\frac{2}{5}$ km/hr

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+ 3 - 2/3 (40 min): $3T - \frac{2}{3}S = 3 \times \frac{2}{3}$

= 2

- 2 + 2/3: $-2T + \frac{2}{3}S = 2 \times \frac{2}{3} - \frac{4}{3}$

..... (i)

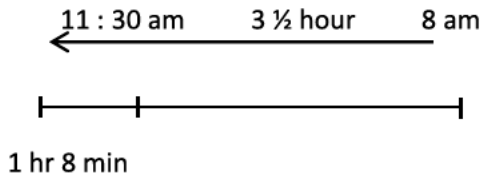
Solving equation (i) and (ii) we got: -

T = 10/3 hrs

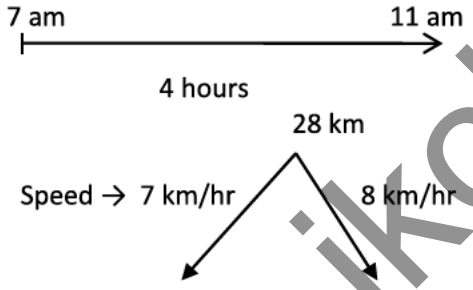
S = 12 km/hr

D = S × T = 12 × 10/3 = 40 km

199. (d)



1 hr 8 min



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

→ Distance = 7 × 1

= 7 am

their relative speed in oppo. direction

= (7 + 8) km/hr

= 15 kmph

→ Time will be taken to cover 21 km

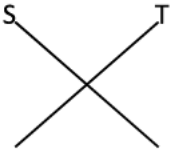
= 21/15 → 7/5

= 1 hour + $\frac{2}{5}$ × 60 min

= 1 hour + 24 min

→ Therefore they will cross each other at = 8 am +1 hour + 24 min

200. (d)



201. (c) $S_{avg.} = \frac{2ab}{a+b} = \frac{2\times25\times4}{25+4}$

$= \frac{200}{9}$ km/hr

$2D = \frac{200}{29} \times (5 \times \frac{4}{5})$ = 200/29 × 29/5

= 40 km

→ D = 20 km

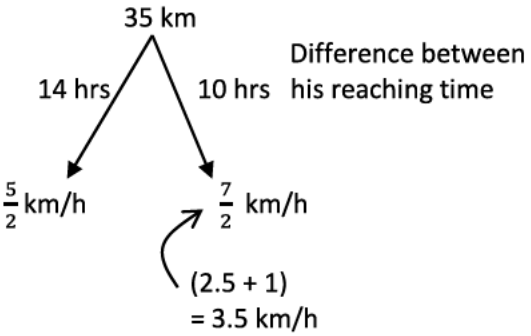
202. (a) $S_{avg.} = \frac{2\times2\times3}{5}$ = 12/5 km/hr

$= \frac{2ab}{a+b}$ (when the distanace travelled is equal)

$2D = 5 \times \frac{12}{5}$ = 12 kms

D = 6 kms

203. (b)



Difference between his reaching time.

= (14 – 10hrs = 4hrs

= 4 hrs → 6m + 6m (late + before)

= 4 hrs → 12 minutes

= 1 unit = 12/(4 × 60) km

[thus, 1 m = 60 second] = 1 unit

= 1/20 km

then 35 units = 35 × 1/20 km

= 7/4 km

Then the idstance between his house and school is = 7/4 km

Alternate:

Here, S_1 = First speed

S_2 = Speed after increament

t_1 = late time

t_2 = Before time

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Distance = $\frac{s_1 s_1}{s_1 - s_1} \times \frac{t_1 + t_1}{60}$

$= \frac{\frac{5}{2} \times \frac{7}{2}}{\frac{7}{2} - \frac{5}{2}} \times \frac{6+6}{60}$ hr.

$= \frac{\frac{35}{4} \times \frac{12}{60}}{1} = \frac{7}{4}$ km

204. (d) Let the height of the hill is = x km.
Thus, the distance will be same man either ascend and decend = $\frac{x\ km}{9\frac{k}{h}} + \frac{x}{\frac{3km}{hr}}$ =5hrs

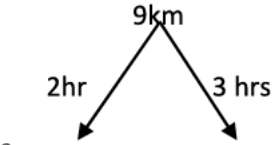
[Thus, time = Distance/Speed
Total time = A scending time + dencending time]

$= \frac{2x}{9} + \frac{x}{3} = 5$

$= \frac{2x+3x}{9} = 5$

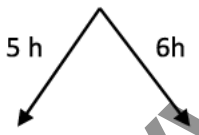
= 5x = 5 × 9 = x = 9 km

Alternate:



$\frac{9}{2}$ km/h 3 km/h
Aesending Speed Aesending Speed
Total time = 2 + 3 = 5 hrs
Here = 5 hrs = 5 hrs(actual time)
Thus, 1 unit = 1
Thus, Ascending length = 9 km

205. (a) (6 × 7× 5) = 210 km



42 km/h 35 km/h

Let total distance = 210 km
Difference between time = (6h – 5h)
= 1 hour
= 60 min
But give is that diff. of time = 15 min earlie + 5 min late = 20 min = 20
i.e.
= 60 20 min
Then unit → 1/3
Total distance of the bank from the starting point is
= 210 × 1/3 = 70 km
Alternate:

Total distance = $\frac{S_1 S_2}{S_1 - S_2} \times \frac{t_1 + t_2}{60}$
(Diff. of time)

$= \frac{42 \times 35}{42 - 35} \times \frac{20}{60}$ = 70 km

206. (d) 20 km (Total distance)

4 km/hr 5 km/hr
→ Difference of time
→ 5 hr - 4 hr = 1 hr
→ 60
But his actual difference of time = 9 min. late + 9 min early = 18
→ 60 unit → 18/60 = 3/20
→ So Reqd distance will be 20 × 3/10 → 6 km
Alternate :

→ Distance = $\frac{S_1 S_2}{S_1 - S_2} \times \frac{t_1 + t_2}{60}$ (Differece of time)

$= \frac{5 \times 4}{5 - 4} \times \frac{9 - (-9)}{60}$ =

Distance = 6 kms

207. (b) According to the question
Ratio of its time → 9/2 hour : 4 hours
Rato of its speed = 8 : 9

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40 kmph = 5 kmph

Here, we find that speed of the car is increased 1 km/hr

but Actual increasement is 5 km/hr

ie. 1 unit = 5 kmph

8 units = 8 × 5 = 40 km

Therefore solwer speed of car = 40 kmph

Alternate:

Let total distance = d km

According to the question,

→ $d/4 - \frac{d}{(4\frac{1}{2})} = 5$

→ $\frac{d}{4} - \frac{2d}{9} = 5$

→ 9d – 8d = 36 × 5

→ Distance = 180 km

→ Therefore slower speed is = $\frac{Distance}{time}$

→ $\frac{180}{\frac{9}{2}}$ Slower speed = 40 kmph

=

208. (c) 24 km/hr 30 km/hr

5 hr 4hr

120 km

= (5 - 4) = 1 unit → $1\frac{11}{60}$

120 unit → 11/60 × 120 = 22 km

Thus, Distance from house to office = 22 km

209. (c) 5 km/hr 3 km/hr

3hr 5 hr

15 km

= 5 – 3 = 2 units → $\frac{24}{60}$ = 3 km

210. (b) $2\frac{1}{2}$ km/hr 3 kmk/hr

6 hr 5 hr

15 km

= 6 – 5 = 1 unit → $\frac{16}{60}$

15 unit → $\frac{16}{60} \times 15$ = 4

= Required distance = 4 km

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

6hr 5 hr

60 km

= 6 - 5 = 1 unit → 12/60 = 1/5

= 60 units → 1/5 × 60 = 12

= Required distance = 12 km

212. (a) 5 km/hr 6 km/hr

6 hr 5 hr

30 km

= 6 – 5 = 1 units → (7 + 5)/60 = 1/5

30 units → 1/5 × 30 = 6 km

213. (c) usual : late

Their ratio of speed = 40 : 35

Their Ratio of time 8 : 7

7 : 8

1 hour late

1 unit → $\frac{15}{60}$ *hour* = ¼ hours

8 units = 8 × ¼ = 2 hr.

Total distance = 35 × 2 = 72 km

Alternate: → Let the total distance = d km

According to the question,

→ $\frac{d}{35} - \frac{d}{40} = \frac{15}{60}$

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→ $40\,d - 35d = \frac{15 \times 40 \times 35}{60}$

→ $5d = 350$

→ Distance = 70 km

214. (b) LCM → 30 km(distance)

→ Difference of time

= 6 hr - 5 hr = 1 hr(60 min)

But actual difference of time = 6 min

late + 2 min early = 8 min

i.e.

60 units → 8 min

→ 1 unit → 8/60

→ Total distance of his office

$= 30 \times \frac{8}{60}$

→ Total distance of his office

= 30 × 8/60 = 4 km

Alternate:

Distance between his home to office

$$\frac{S_1S_2}{S_1 - S_2} \times \frac{Diff.of\ time}{60}$$

$= \frac{5\times6}{6-5} \times \frac{8}{60} = 4$ kms

215. (b) Accprdomg tp the question (195)

→ Distance between his house to school

→

$$\frac{S_1S_2}{S_1 - S_2} \times \frac{Diff.of\ time}{60}$$

$= \frac{4\times4}{4-3} \times \frac{10\,\text{min}\,early + 10\,\text{min}\,late}{60}$

→ $12 \times \frac{12}{60}$

→ Distance = 4 km

216. (b) The distance between of school and home

$$\frac{S_1S_2}{S_1 - S_2} \times \frac{Diff.of\ time}{60}$$

$= \frac{5\times4}{5-4} \times \frac{5\ min\ late + 10\ min\ before}{60}$

= 12 × 20/60

→ Distance = 5 km

217. (b) In such type of question follow the below given method.

S	T	d (s × t)
+ 10	- 1	→ 10
+20	$-\frac{7}{4}$	$-\frac{7}{4}$ → 35

- s + 10t = 10 ..... (i)

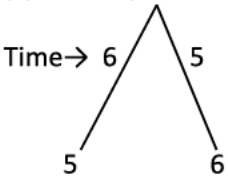
$-\frac{7}{4}$s + 20t = 35 ..... (ii)

On solving equation (i) and (ii) we get

S = 60 km/hr and T = 7 hours

Total distance = 60 × 7 = 420

218. (c) 30 km (Total Distance)



Speed

(km/h)

1st case IInd case

Diff of time is = (6 - 5) hours

→ 1 hour

Actual Diff. of time

= 7 min - (-5 min)

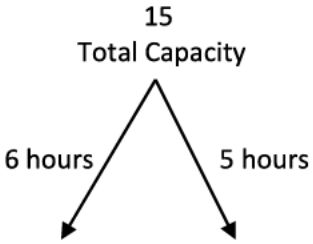
→ (7 + 5) min

→ 12 min

1 hour —1/5→ 12 min

30 km —1/5→ 6 km

219. (b)



→ Diff. between time

= 6-5 = 1 hour = 60 min

→ 60 min {early + late

6 + 10 }

→ 60 units → 16 min

→ 1 unit → 16/60

→ 1 unit → 4/15

→ Total distance 15 units = $\frac{15\times4}{15}$ =4 km.

Alternate:

Distance = $\frac{S_1S_2}{S_1 - S_2} \times \frac{diff.between\ time}{60}$

= $\frac{\frac{5}{2}\times3}{\left(3-\frac{5}{2}\right)} \times 16/60 = 4$ km

220. (a) Let the speed = x km/hr

then time = y hr.

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ATO

$x \times y = (x + 3)(y - 1)$

$xy = xy + 3y - x - 3$

$x - 3y = -3$ ..... (i)

$x \times y = (x - 2)(y + 1)$

$xy = xy - 2y + x - 2$

$x - 2y = 2$ ..... (ii)

Solve equation (i) and (ii)

$x = 12,\ y = 5$

Distance = Speed × Time

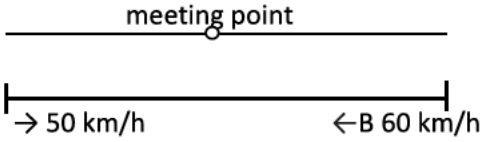
$= 12 \times 5 = 60$ km

221. (c) distance between the fort and the man

$= 330 \times 10 = 3300$ m

$= 3.3$ km

222. (c)



Thus, The second train has travelled 120 km more than the first train only because the speed of the first train only becaue the speed of the second train is 10km/h more than the first train and their starting time is same.

→ Time taken by the second train cover 120 kms with the surplus speed of 10 km/h.

$(60 + 50 = 10$ km) $= \frac{120}{10} = 12$ hrs

→ i.e. time, taken by the both train before meeting point in opposite direcdtion = 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

$= \frac{120km}{(60-50)km/h}$

= 12h

distance b/w A and B = (60 + 50) × 12 = 1320 km

223. (d) Second trains covers the 120 kms more distance only be cause of its exceed speed of (60 - 50) = 10 kmph

→ Time, taken by trains to meed each other = $\frac{90kms}{10\ km/h}$ →9 hours

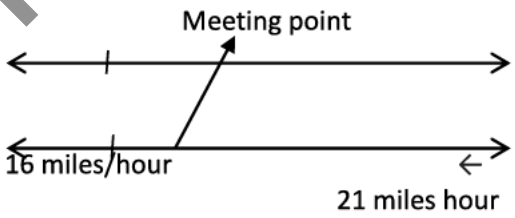
→ Distance covered by first train = 9 × 50 = 450 km

→ Distance coverd by the second train = 9 hours × 60 kmph → 540 km.

→ Total distance between A and B

→ 540 + 450 = 990 km

224. (a)



→ In the question, it is given that at the time of their meeting the seond train has travelled 60 miles more than the first trains.

→ It would have happened only because of the exceed speed of second train

= 21 – 16 = 5 mile/h

→ i.e. second train covers 60 miles with exceed speed 5 mile/hour

→ i.e. second trains runs $= \frac{60miles}{5\ miles} = 12$ hours

According to the question,

Running time of first train

Running time of second train

Distance covered by first train

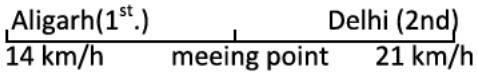
$= 16 \times 12 = 192$ mile

Distance covered by second train

$= 21 \times 21 = 252$ mile

→ Total distance = 252 + 192 = 444 miles

225. (b)



Distance travelled by 1st trainin 't'

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time = 14 km/hr × t h[th = time ours]
Distance travelled by II train in 't' time = 21 km/hr × t h
Difference their distance = = 70 km
21 × t - 14 × t = 70
7t = 70
t = 10h
It means both train travelled 10 hr
1st train complete = 14 km/h × 10 hr = 140 km
IInd train complete = 21km/h × 10 hr = 210 km
Total distance = 140 + 210 = 350 km

226. (b) Time taken to walk one way = $\frac{55}{2}$
Time taken to ride one way=37- $\frac{55}{2}$ min = $\frac{19}{2}$ min
time taken to ride both ways
= 19/2 × 2 min = 19 min

227. (d) Time taken to ride one way = 1.5 hrs
Time taken to walk oneway = 4.5 – 1.5 = 3 hrs
Time taken to talk both way = 3 × 2 = 6 hrs

228. (c) Walking time + riding time = 6 hours 15 min
→ Walking time + walking time = 7 hours 45 min
→ W + R = 25/4 hours
[6 hrs 15 min = $\frac{25}{4}$]
→ W + W = 31/4 hours
[7 hrs 45 min = 31/4]
→ 2W = 31/4 hours
Walking = 31/8 hours
→ 31/8 + Riding time = 25/4 hour
→ Riding time of one way = $\frac{25}{4} - \frac{31}{8} = \frac{50-31}{8}$
→ Riding time of onw way = $\frac{19}{8}$ hous
→ Therefore Riding time of both ways = $\frac{196}{8} \times 2 = \frac{19}{4}$
→ 41 hours 45 minutes

229. (b) $\frac{Speed\ of\ A}{Speed\ of\ B} = \sqrt{\frac{Time\ of\ B}{Time\ of\ A}}$
= $\sqrt{\frac{9}{4}} = \frac{3}{2}$
→ Speed of A : Speed of B = 3 : 2
As speed is inversely proportional to time.

230. (c) Let the speed of Ravi = x km/h
→ Then Ajay's speed will be = (x + 4) km/hr
→ Total distance, covered by Ajay = 60 + 12 = 72
→ Total distance, coverd by Ravi = 60 – 12 = 48 km
According to question,
They runs at same time.
→ $\frac{72}{x+4} = \frac{48}{x}$
→ 72x = 48x + 192
→ 24x = 192
→ x = 8 km/h
→ There, Ravi's speed = 8 km/h
Alternate:

Distance covered by, Ajay
= AB + BC = 72
Ajay : Ravi
72 : 48 [Here time is same so, Ratio of Distance = Ratio of speed]
3 : 2
Difference = 1
1 = 4
Speed of Ravi = 2 × 4
= 8 km/hr

231. (b) By mixture & Allegetion method
Foot bicycle
36 81
61
20 25
4 : 5 Ratio of time

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= Time taken on foot = $\frac{4}{4+5} \times 9 = 4h$

Distance covered on foot = 4 × 4 = 16 km

232. (b)

Train Car

60 km 240 km 4 hr

+40 + 10 min

100 km 200 km 4hr/10 min

+200 min + 10 × 5 = 50

300 0 km 5 hr

= Speed of train = 300/5 = 60 km/hr

233. (a) 7 hours

on foot bicycle

8 km/hr 16 km/hr (8 km/h + km/hr)

distance = 8 × 7 = 56 km

According to question,

→ 24 km would have have covered by bicycle with 8 km/hr

→ Time taken by bicycle = $\frac{24}{8}$ 3 hours

So, time taken by bicycle = 3 hours

Time taken on foot

= 7 3 = 4 hours

→ Distance covered by man on foot

= 8 × 4 = 32 km

234. (a) According to the question.

Distance = 61 km

Time foot = 61/4 hour

Time on bicycle = 61/9 hour

Now using allegation.

Foot Bicycle

$\frac{61}{4}$ $\frac{61}{9}$

9

$9 - \frac{61}{9} = \frac{20}{9}$: $\left(\frac{61}{4}\right) - 9 = \frac{25}{4}$

Distance ratio = 80 + 225

= 305 units

300 units → 61

1 unit × $\frac{61}{305}$

80 units → $\frac{61}{305} \times 80$ = 16 km

Distance travelled on foot = 16 km

235. (a) Let the time taken by A to cover 1 km = x sec.

Time taken by B and C to cover the same distance = x + 25 and x + 55 sec.

	A	B
Distance	1000	725
Time	29	40

A/C = 29/40 = $\frac{x}{x+55}$ → 29x + 1595 = 40x

x = $\frac{1595}{11} = 145$

= 2 minute 25 sec.

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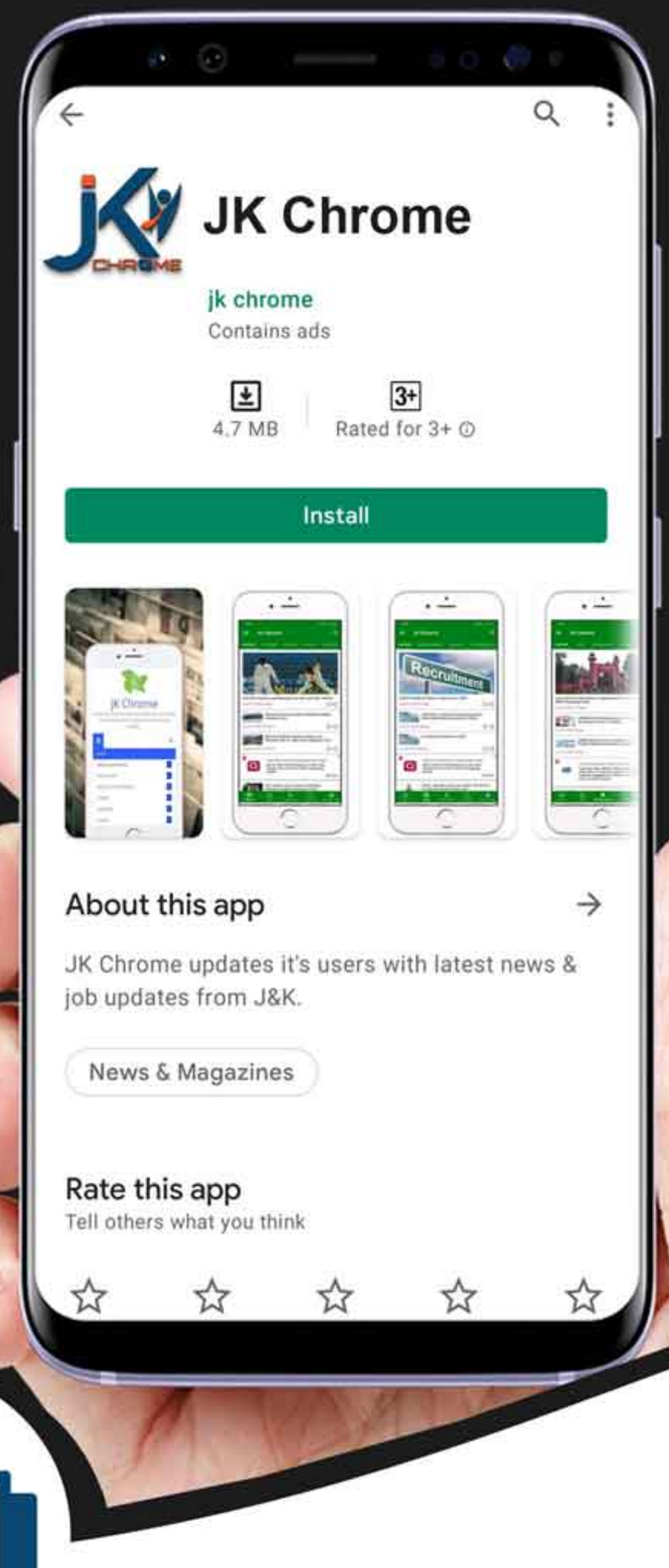

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