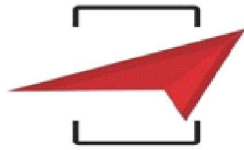
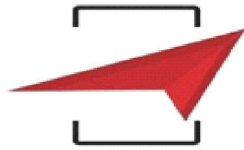


SPEED, TIME & DISTANCE

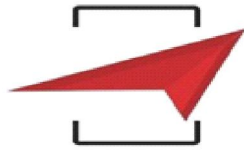
- A car finishes a journey in 10 hours at the speed of 80 km/hr. If the same distance is to be covered in 8 hours, how much more speed does the car have to gain?
(a) 8 km/hr (b) 10 km/hr
(c) 20 km/hr (d) 16 km/hr
- A man covers a certain distance by car driving at 30 km/hr and he returns back to the starting point riding on a scooter at 20 km/hr. Find his average speed for the whole journey.
(a) 24 km/hr (b) 26 km/hr
(c) $36\frac{2}{3}$ km/hr (d) $26\frac{2}{3}$ km/hr
- On a tour a man travels at the rate of 64 km an hour for the first 160 km, then travels the next 160 km at the rate of 80 km an hour. The average speed in km per hour for the first 320 km of the tour, is
(a) 35.55 km/hr (b) 71.11 km/hr
(c) 36 km/hr (d) 72 km/hr
- A motor car does a journey in 27 hrs, the first half at 14 km/hr and the second half at 13 km/hr. Find the distance.
(a) 273.5 km (b) 351 km
(c) 364 km (d) 291.5 km
- A person travels from P to Q at a speed of 40km/h and returns by increasing his speed by 50%. His average speed for both the trips is-
(a) 136km/h (b) 48km/h
(c) 45km/h (d) 50km/h
- Jyoti walks from Tilak Nagar to Moti Nagar and back in a certain time at the rate of $3\frac{1}{2}$ km/hr. But if he had walked from Tilak Nagar to Moti Nagar at the rate of 3 km/hr and back from Moti Nagar to Tilak Nagar at the rate of 4 km/hr., he would have taken 10 minutes longer. The distance between Tilak Nagar and Moti Nagar is-
(a) 28 km (b) 32 km
(c) 14 km (d) 20 km
- Walking $\frac{2}{3}$ of his usual speed, a person is 15 min late to his office. Find his usual time to cover the distance.
(a) 30 minutes (b) 25 minutes
(c) 15 minutes (d) 25 minutes
- Walking $\frac{1}{3}$ of his usual speed, a person is 12 min late to his office. Find his usual time to cover the distance.
(a) 36 minutes (b) 18 minutes
(c) 6 minutes (d) Can't be determined
- A man covers a certain distance between his house and office on scooter. Having an average speed of 30 km/hr, he is late by 10 min. However, with a speed of 40 km/hr, he reaches his office 5 min earlier. Find the distance between his house and office.
(a) 10 km (b) 20 km
(c) 30 km (d) 35 km
- A boy walking at a speed of 10 km/hr reaches his school 15 minutes late. Next time he increases his speed 2 km/hr, but still he is late by 5 minutes. Find the distance of his school from his house.
(a) 8 km (b) 5 km
(c) 10 km (d) 15 km
- Excluding stoppages, the speed of a bus is 54 km/hr and including stoppages, it is 45 km/hr. For how many minutes does the bus stop per hour?
(a) 9 min (b) 10 min
(c) 12 min (d) 20 min
- Without stoppage, a train travels certain distance with an average speed of 80km/h and with stoppage, it covers the same distance at the speed of 60km/h. How many min per hour the train stops?
(a) 12 min (b) 10 min
(c) 20 min (d) 15 min
- A man walks at the speed of 5 km/hr and runs at the speed of 10 km/hr. How much time will the man require to cover the distance of 28 km, if he covers half (first 14 km) of his journey by walking and half of his journey by running?
(a) 8.4 hr (b) 6 hr
(c) 5 hr (d) 4.2 hr
- An aeroplane started 30 minutes later than the



- scheduled time from a place 1500 km away from its destination. To reach the destination at the scheduled time the pilot had to increase the speed by 250 km/hr. What was the speed of the aeroplane per hour during the journey?
- (a) 250 km/hr (b) 500 km/hr
(c) 600 km/hr (d) 750 km/hr
15. A person wants to plant trees at the edge of a circular field of radius 21 km at every 6 km of the distance. Find the number of trees he will have to buy for this purpose.
- (a) 21 (b) 22
(c) 23 (d) Data inadequate
16. The wheel of an engine is $3\frac{3}{4}$ metres in circumference and makes 4 revolutions in 2 seconds. The speed of the train is?
- (a) 27 km/hr (b) 31 km/hr
(c) 35 km/hr (d) 30 km/hr
17. Sarita sets out to cycle from Delhi to Mathura and at the same time Suresh starts from Mathura to Delhi. After passing each other they complete their journeys in 9 and 16 hours respectively. At what speed does Suresh cycle if Sarita cycles at 16 km per hour?
- (a) 12 km/hr (b) 16 km/hr
(c) 14 km/hr (d) 20 km/hr
18. Two men start together to walk a certain distance, one at 4 km/hr and another at 3 km/hr. The former arrives half an hour before the latter. Find the distance?
- (a) 6 km (b) 9 km
(c) 8 km (d) 5 km
19. A monkey tries to ascend a greased pole 92 meters high. He ascends 10 meters in first minute and slips down 1 meter in the alternate minute. If he continues to ascend in this process, how long does he take to reach the top?
- (a) 20 min 12 sec. (b) 16 min 18 sec.
(c) 12 min 20 sec. (d) None of these
20. The driver of an ambulance notices a school bus 40 m ahead of him. After 20 seconds school bus is 60 metre behind. If the speed of ambulance is 30km/h then what is then speed of school bus?
- (a) 10 km/hr (b) 16 km/hr
(c) 12 km/hr (d) 15 km/hr
21. Two men A and B walk from P to Q, a distance of 21 km, at 3 and 4 km an hour respectively. B reaches Q, returns immediately and meets A at R. Find the distance from P to R.
- (a) 15 km (b) 20 km
(c) 18 km (d) 12 km
22. Two cars A and B are running towards each other from two different places 88 km apart. If the ratio of the speeds of the cars A and B is 5 : 6 and the speed of the car B is 90 km per hour then after how much time will the two car meet each other?
- (a) $26\frac{2}{3}$ min (b) 24 min
(c) 32 min (d) 36 min
23. A train passes a platform in 36 second and a man standing on the platform in 20 seconds. If the speed of the train is 54 km/hour, what is the length of the platform?
- (a) 120 m (b) 240 m
(c) 340 m (d) 300 m
24. Two trains 100 m and 120 m long are running in the same direction with speeds of 72 km/hours and 54 km/hours. In how much time will the first train cross the second one?
- (a) 40 second (b) 44 second
(c) 46 second (d) 50 second
25. A train 240 m long passed a pole in 24 seconds. How long will it take to pass a platform 650 m long?
- (a) 65 second (b) 89 second
(c) 100 second (d) 150 second
26. How long does a train 110 m long running at the speed of 72 km/hour takes in crossing a bridge 132 m in length?
- (a) 9.8 second (b) 12.1 second
(c) 12.42 second (d) 14.3 second
27. A 260 m long train crosses a 120 m long wall in 19 seconds. What is the speed of the train?
- (a) 27 km/hour (b) 49 km/hour
(c) 72 km/hour (d) 70 km/hour
28. A train covers a distance of 12 km in 10 minutes. If it takes 6 seconds to pass a telegraph post, then the length of the train is
- (a) 90 m (b) 100 m
(c) 120 m (d) 140 m
29. Two trains, each 100 m long, moving in opposite directions, cross each other in 8 seconds. If one is



- moving twice as fast the other, then the speed of the faster train is
- (a) 30 km/hour (b) 45 km/hour
(c) 60 km/hour (d) 75 km/hour
- 30.** A goods train runs at a speed of 72 kmph and crosses a 250 m long platform in 26 seconds. What is the length of the goods train?
- (a) 230 m (b) 240 m
(c) 260 m (d) 270 m
- 31.** A man rows upstream 11 km and downstream 26 km taking 5 hours each time. The velocity of the current is km/hr.
- (a) 1 km/hr (b) 1.3 km/hr
(c) 1.5 km/hr (d) 2.5 km/hr
- 32.** The speed of a boat in downstream is 15 km/hr and the speed of the stream is 1.5 km/hr. The speed of the boat upstream is
- (a) 13.5 km/hr (b) 16.5 km/hr
(c) 5.25 km/hr (d) 12 km/hr
- 33.** A boat moves downstream at the rate of 12 km/hr and upstream at 4 km/hr. Find the speed of the boat in still water and also the speed of current.
- (a) 7 km/hr, 2 km/hr (b) 6 km/hr, 2 km/hr
(c) 7 km/hr, 1 km/hr (d) 8 km/hr, 4 km/hr
- 34.** A man can row 60 km downstream in 6 hours. If the speed of the current is 3 km/hr, then find in what time will he able to cover 16 km upstream?
- (a) 4.5 hours (b) 4 hours
(c) 5 hours (d) 5.5 hours
- 35.** In one hour, a boat goes at the rate of 11 km/hr along the stream and 5 km against the stream. The speed of the boat in still water is
- (a) 10 km/hr (b) 8 km/hr
(c) 4 km/hr (d) 3 km/hr
- 36.** Speed of a boat in standing water is 9 km/hr and the speed of the stream is 1.5 km/hr. A man rows to a place at a distance of 105 km and comes back to the starting point. The total time taken by him is
- (a) 24 hr (b) 20 hr
(c) 30 hr (d) 15 hr
- 37.** A man can row 30 km upstream and 44 km downstream in 10 hr. Also, he can row 40 km upstream and 55 km downstream in 13 hours. Find the rate of the current and the speed of the man in still water.
- (a) 3 km/hr, 8 km/hr (b) 3.5 km/hr, 7.5 km/hr
(c) 4 km/hr, 7 km/hr (d) 4.5 km/hr, 6.5 km/hr
- 38.** A man can row 4.5 km/hr in still water and he finds that it takes him twice as long to row up as to row down the river. Find the rate of stream.
- (a) 2 km/hr (b) 1.5 km/hr
(c) 2.5 km/hr (d) 1.75 km/hr



HINT & SOLUTIONS

1. Distance covered by car = $80 \times 10 = 800$ km.
Speed of car when distance is covered in 8 hrs =

$$\frac{800}{8} = 100 \text{ km/hr.}$$

- \ More speed does the car have to gain = $100 - 80 = 20$ km/hr.

2. Let the distance between two extreme point be = LCM of 30 and 20 = 60 km.

$$\text{Average speed} = \frac{60 + 60}{\frac{60}{30} + \frac{60}{20}} = \frac{120}{5} = 24 \text{ km/hr.}$$

3. Average speed for the first 320 km of the tour

$$= \frac{320 + 320}{\frac{320}{64} + \frac{320}{80}} = \frac{640}{9} = 71.11 \text{ km/hr.}$$

4. Ratio of Speed @ 14 : 13

$$\text{Ratio of Time @ } 13 : 14$$

$$\therefore 27 \text{ units} = 27 \text{ hrs}$$

$$\backslash 1 \text{ unit} = \frac{27}{27} = 1 \text{ hr.}$$

As half of the distance is covered at the speed of 14 km/hr in 13 hrs.

$$\text{Distance of the whole journey} = 14 \times 13 \times 2 = 364 \text{ km.}$$

5. Speed of person while returning

$$= 40 + \frac{50}{\frac{100}{40} - \frac{100}{60}} = 40 + 20 =$$

$$60 \text{ km/hr}$$

Let total distance covered

$$= (\text{LCM of } 40 \text{ and } 60) \times 2 =$$

$$240$$

$$\therefore \text{Average speed} = \frac{240}{\frac{120}{40} + \frac{120}{60}} = 48 \text{ km/hr}$$

6. Let distance be 'B' km.

$$\text{P } \frac{7B}{12} - \frac{4B}{7} = \frac{1}{6}$$

$$\text{P } \frac{49B - 48B}{84} = \frac{1}{6}$$

$$\text{P } \frac{B}{84} = \frac{1}{6}$$

$$\text{P } B = 14 \text{ km.}$$

7.

	Usual	New
Ratio of Speed	→ 3	: 2
	↙	↘
Ratio of Time	→ 2	: 3
	└───┬───┘ 1 unit	

$$\therefore 1 \text{ unit} = 15 \text{ min}$$

$$\backslash 2 \text{ units} = 15 \times 2 = 30 \text{ min}$$

$$\backslash \text{Usual time taken to cover the distance} = 30 \text{ min.}$$

8.

	Usual	New
Ratio of Speed	→ 3	: 1
	↙	↘
Ratio of Time	→ 1	: 3
	└───┬───┘ 2 units	

$$\therefore 2 \text{ units} = 12 \text{ min}$$

$$\backslash 1 \text{ unit} = \frac{12}{2} = 6 \text{ min.}$$

$$\backslash \text{Usual time taken to cover the distance} = 6 \text{ min.}$$

9.

	30	: 40
Ratio of Speed	→ 3	: 4
	↙	↘
Ratio of Time	→ 4	: 3
	└───┬───┘ 1 unit	

$$\text{Total saving in time} = 10 + 5$$

$$= 15 \text{ min [Late, early case]}$$

$$\therefore 1 \text{ unit} = 15 \text{ min}$$

$$\backslash 4 \text{ units} = 15 \times 4 = 60 \text{ min}$$

$$\backslash \text{Distance between his house and office}$$

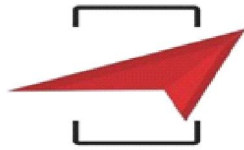
$$= \frac{60 \times 30}{60} = 30 \text{ km}$$

10.

	10	: 12
Ratio of Speed	→ 6	: 5
	↙	↘
Ratio of Time	→ 6	: 5
	└───┬───┘ 1 unit	

$$\text{Total saving in time} = 15 - 5 = 10 \text{ mins [Late, late case]}$$

$$\therefore 1 \text{ unit} = 10 \text{ mins}$$



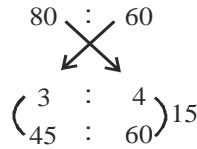
\ 6 units = 10×6 = 60 mins

\ Distance from house to school = $\frac{60 \times 10}{60} = 10$ km

11. Minutes does the bus drove = $\frac{45}{54} \times 60 = 50$ mins

\ Minute does the bus stop = 60 - 50 = 10 mins.

12. Without stoppage With stoppage



Minutes does the train stop = 60-45 = 15

13. Required time to cover the distance

= $\frac{14}{5} + \frac{14}{10} = \frac{28+14}{10} = \frac{42}{10} = 4.2$ hr.

14. Go through option

Let speed of the aeroplane be 750 km/hr

$\frac{1500}{750} - \frac{1500}{750+250} = \frac{30}{60} = \frac{1}{2}$

Satisfied given condition.

\ Usual speed = 750 km/hr.

15. Circumference of the circular field = $2\pi r$

= $2 \times \frac{22}{7} \times 21 =$

132km

\ Required number of trees = $\frac{132}{6} = 22$

16. Speed of the train = $\frac{15}{4} \times 4 \times \frac{1}{2} \times \frac{18}{5} = 27$ km/hr.

17. $\frac{S_{Sarita}}{S_{Suresh}} = \sqrt{\frac{T_{Suresh}}{T_{Sarita}}}$

$\frac{16}{S_{Suresh}} = \sqrt{\frac{16}{9}}$

$S_{Suresh} = 12$ km/hr

18. Ratio of Speed → 4 : 3

Ratio of Time → $\frac{3}{1}$: $\frac{4}{1}$

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

Distance = $3 \times \frac{1}{2} \times 4 = 6$ km.

19. Distance covered by monkey in 2 mins = (10-1) = 9 meters.

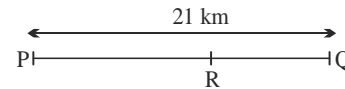
Now, Monkey will cover 9×10 = 90 m, in 2×10 = 20 min.

Hence total time taken by monkey = 20 min + $\frac{2 \text{ min}}{10}$ = 20 min 12sec.

20. $S_A - S_B = \frac{40+60}{20} = 5$ m/s = 18 km/hr

Speed of school bus = 30-18 = 12 km/hr

21.



Ratio of Speed @ 3 : 4

Ratio of Time @ 4 : 3

As in 7 units of time, distance covered from P to Q and Q to P

= 21×2 = 42km.

\ 7 units = 42km

\ 1 unit = $\frac{42}{7} = 6$ km

Let distance covered by A at 3 km/hr of speed be 3 units.

\ Distance from P to R = 3 units = (3×6)km = 18km

22. Required time = $\frac{48}{90} \times 60 = 32$ min

23. Time taken to cover only length of the platform = (36 - 20) = 16 sec

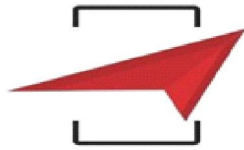
\ Length of the platform = $\frac{54 \times 5 \times 16}{18} = 240$ m

24. Required time = $\frac{100+120}{(72-54) \times \frac{5}{18}} = \frac{220}{5} = 44$ sec

25. Required Time = $\frac{240+650}{\frac{240}{24}} = \frac{890}{10} = 89$ sec

26. Required Time = $\frac{100+132}{72 \times \frac{5}{18}} = \frac{242}{20} = 12.1$ sec

27. Speed = $\left(\frac{260+120}{19}\right) \times \frac{18}{5} = \frac{380}{19} \times \frac{18}{5} = 72$ km/hr.



28. Length of the train = $\frac{12 \times 1000}{10 \times 60} \times 6 = 120 \text{ m}$

29. $S_1 + S_2 = \frac{100 + 100}{8} = 25$

$S_1 : S_2 = 1 : 2$

$\therefore S_2 = \frac{25}{3} \times 2 \times \frac{18}{5} = 60 \text{ km/hr.}$

30. Length of the goods train = $72 \times \frac{5}{18} \times 26 - 250 = 270$

sec

31. $B - S = \frac{11}{5}$

$B + S = \frac{26}{5}$

$\underline{\quad \quad \quad}$
 $-2S = \frac{11}{5} - \frac{26}{5} = \frac{-15}{5} = -3$

$\Rightarrow S = \frac{3}{2} = 1.5 \text{ km/hr}$

32. $B + S = 15 \text{ km/hr} \dots\dots\dots(1)$

Speed of boat = $15 - 1.5 = 13.5 \text{ km/hr}$

\therefore Speed of boat in upstream = $(13.5 - 1.5) \text{ km/hr}$
 $= 12 \text{ km/hr}$

33. $B + S = 12 \text{ km/hr} \quad (1)$

$B - S = 4 \text{ km/hr} \quad (2)$

Solving (1) & (2) we get,

Speed of boat = $B = \frac{12 + 4}{2} = 8 \text{ km/hr}$

Speed of current = $S = 12 - 8 = 4 \text{ km/hr}$

34. $B + S = \frac{60}{6} = 10 \text{ km/hr}$

$B = 10 - 3 = 7 \text{ km/hr}$

$B - S = \frac{16}{t}$

$7 - 3 = \frac{16}{t}$

$4t = 16, \quad t = 4 \text{ hrs}$

35. $B + S = 11$

$B - S = 5$

$\underline{\quad \quad \quad}$
 $2B = 16$

$\Rightarrow B = \frac{16}{2} = 8 \text{ km/hr.}$

36. Total time taken = $\frac{105}{9 + 1.5} + \frac{105}{9 - 1.5}$

$= \frac{105}{10.5} + \frac{105}{7.5} = 10 + 14 = 24 \text{ hr}$

37. $\frac{30}{B - S} + \frac{44}{B + S} = 10 \dots\dots(1)$

& $\frac{40}{B - S} + \frac{55}{B + S} = 13 \quad \dots\dots(2)$

In such type of equation based question we should proceed through option.

Clearly $B = 8 \text{ km/hr}$ & $S = 3 \text{ km/hr.}$

satisfies (1) & (2)

Hence, speed of the current = 3 km/hr.

& speed of the man = 8 km/hr.

38. Here, distance is constant

(Up) (Down)

Ratio of time 2 : 1

Speed 1 : 2

$M : S = (1 + 2) : (2 - 1) = 3 : 1$

1 unit = 1.5 km/hr

Speed of stream in still water = $\frac{4.5}{3} \text{ km/hr} = 1.5 \text{ km/hr}$

hr