



TIME & DISTANCE

- If an EMU train 110 m long passes a telegraph pole in 3 seconds, then the time taken by it to cross a railway platform 165 m long is-
 - 3 sec
 - 4 sec
 - 5 sec
 - 7.5 sec
- Gomti express train 150 m long moving at a speed of 25 metres per second overtakes a man moving at 5 metres/sec in opposite direction. The train will pass the man in-
 - 5 sec
 - 6 sec
 - $4\frac{2}{7}$ sec
 - 8 sec
- A Fast Passenger train 110 m long passes a man, running at 6 kmph in the direction opposite to that of the train, in 6 seconds. The speed of the train is-
 - 60 km/hr
 - 66 km/hr
 - 54 km/hr
 - 72 km/hr
- A train B speeding with 120 kmph crosses another train C, running in the same direction in 2 minutes. If the lengths of the trains B and C be 100 m and 200 m respectively, what is the speed of the train C?
 - 111 kmph
 - 127 kmph
 - 123 kmph
 - 129 kmph
- Two Local trains travel in opposite directions at 36 kmph and 45 kmph and a man sitting in slower train passes the faster train in 8 seconds. The length of the faster train is -
 - 80 m
 - 100 m
 - 120 m
 - 180 m
- A Metro train running at certain speed crosses a stationary engine in 20 seconds. To find out the speed of the train, which of the following information is necessary?
 - Only the length of the train
 - Only the length of the engine
 - Either the length of the train or the length of the engine
 - Both the length of the train and the length of the engine
- A passenger train overtakes two persons who are walking in the same direction in which the train is going, at the rate of 2 kmph and 4 kmph and passes them completely in 9 and 10 seconds respectively. The length of the train is-
 - 72 m
 - 54 m
 - 50 m
 - 45 m
- Two stations A and B are 110 km apart on a straight line. One train starts from A at 7 a.m. and travels towards B at 20 kmph. Another train starts from B at 8 a.m. and travels towards A at a speed of 25 kmph. At what time will they meet?
 - 9 a.m.
 - 10 a.m.
 - 11 a.m.
 - 10.30 a.m.
- Two trains are running in opposite directions towards each other with speeds of 54 kmph and 48 kmph respectively. If the length of one of the train is 250 m and they cross each other in 18 seconds, the length of the other trains is-
 - 145 m
 - 230 m
 - 260 m
 - 180 m
- A train travelling at 48 kmph completely crosses another train having half its length and travelling in opposite direction at 42 kmph, in 12 seconds. It also passes a railway platform in 45 seconds. The length of the platform is
 - 560 m
 - 400 m
 - 600 m
 - 450 m
- A train of length 150 m takes 10 seconds to pass over another train of 100 m long coming from the opposite direction. If the speed of the first train be 30 kmph, the speed of the second train is
 - 36 kmph
 - 54 kmph
 - 60 kmph
 - 72 kmph
- A man sees a train passing over a bridge 1 km long. The length of the train is half that of the bridge. If the train clears the bridge in 2 minutes, the speed of the train is -
 - 30 km/hr
 - 45 km/hr
 - 50 km/hr
 - 60 km/hr
- A car travels from A to B at V_1 km/h, travels back from B to A at V_2 km/h, and again goes from A to B at V_2 km/h. The average speed of the car is:
 - $\frac{2V_1V_2}{V_1+2V_2}$
 - $\frac{2V_1V_2}{V_2+2V_1}$
 - $\frac{3V_1V_2}{V_2+2V_1}$
 - $\frac{3V_1V_2}{V_1+2V_2}$
- Narayan Kant walking at a speed of 20 km/h reaches his college 10 minutes late. Next time he increases his speed by 5 km/h. but finds that he is still late by 4 minutes. What is the distance of his college from his house?
 - 20 km
 - 6 km
 - 12 km
 - None of these





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15. A Spice jet plane left half an hour later than the scheduled time and in order to reach its destination 1500 kilometre away on time, it had to increase its speed by 33.33 per cent over its usual speed. Find its normal speed.
 (a) 250 kmph (b) 500 kmph
 (c) 750 kmph (d) None of these
16. In a Ganga stream, B lies in between A and C such that it is equidistant from both A and C. A boat can go from A to B and back in 6 h 30 minutes while it goes from A to C in 9h. How long would it take to go from C to A? (The direction of stream is from point C to Point A)
 (a) 3.75 h (b) 4 h
 (c) 4.25 h (d) 4.5 h
17. A man can row 30 km upstream and 44 km downstream in 10 hours. It is also knows that he can row 40 km upstream and 55 km downstream in 13 hours. Find the speed of the man in still water.
 (a) 4 km/h (b) 6 km/h
 (c) 8 km/h (d) 12 km/h
18. In a stream that is running at 2 km/h, a man goes 10 km upstream and comes back to the starting point in 55 minutes. Find the speed of the man in still water.
 (a) 20 km/h (b) 22 km/h
 (c) 24 km/h (d) 28 km/h
19. A motorboat whose speed in still water is 10 km/h went 91 km downstream and then returned to its starting point. Calculate the speed of the river flow if the time taken to cover round trip is 20 hours .
 (a) 3 km/h (b) 4 km/h
 (c) 2 km/h (d) 8 km/h
20. Without any stoppage a person travels a certain distance at an average speed of 42 km/hr and with stoppages he covers the same distance at an average speed of 28 km/h. How many minutes per hour does he stop?
 (a) 25 minutes/ मिनट (b) 30 minutes/ मिनट
 (c) 20 minutes/ मिनट (d) None of these
21. A and B are two stations. A train goes from A to B at 64 km/hr and returns to A at a slower speed. If its average speed for the whole journey is 56 km/hr, at what speed did it return? (Calculate up to two decimal points)
 (a) 48.77 km/hr (b) 49.77 km/hr
 (c) 30.56 km/hr (d) 47.46 km/hr
22. Amitav started cycling along the boundaries of a square filed from cover point A. After half an hour, he reached the corner point C, diagonally opposite to A. If his speed was 8 km/hr, what is the area of the filed in square km.
 (a) 64 (b) 8
 (c) 4 (d) cannot be determined
23. A Royal Enfield motor cyclist goes from Mumbai to Pune, a distance of 192 kms, at an average speed of 32 kmph. Another man starts from Mumbai by car, $2\frac{1}{2}$ hours after the first and reaches Pune half an hour earlier. What is the rate of the speed of the motorcycle and the car?
 (a) 1 : 2 (b) 1 : 3
 (c) 10 : 27 (d) 5 : 4
24. A person sets to cover a distance of 12 km in 45 minutes. If he covers $\frac{3}{4}$ of the distance in $\frac{2}{3}$ rd time, what should his speed to cover the remaining distance in the remaining time?
 (a) 16 km/hr (b) 8 km/hr
 (c) 12 km/hr (d) 14 km/hr
25. Length of a goods train is 287 m and it passes a Ganga river bridge in 38 sec running at the speed of 90 km/h. What is the length of the Ganga river bridge?
 (a) 665 m (b) 663 m
 (c) 680 m (d) 580 m

SOLUTIONS

1. (d); Speed = $\left(\frac{110}{3}\right)$ m/sec
 Time taken to cross railway platform
 $= \left[(100 + 165) \times \frac{3}{110}\right]$ sec.
 $= \left(275 \times \frac{3}{110}\right)$ sec
 $= 7.5$ sec
2. (a); Speed of train relative to man
 $= (25 + 5)$ m/sec
 $= 30$ m/sec.
 \therefore Time taken to pass the man
 $= \left(\frac{150}{30}\right)$ sec = 5 sec.
3. (a); Speed of the train relative to man = $\left(\frac{110}{6}\right)$ m/sec
 $= \left(\frac{110}{6} \times \frac{18}{5}\right)$ kmph = 66 kmph
 Let the speed of the train be x kmph
 Then, relative speed = (x + 6) kmph.
 $x + 6 = 66$ or $x = 60$ kmph.
4. (a); Let the speed of train C be x kmph
 Speed of B relative to C = (120 - x)
 $= \left[(120 - x) \times \frac{5}{18}\right]$ m/sec
 $= \left[\frac{600 - 5x}{18}\right]$ m/sec
 Distance covered = (100 + 200) m = 300 m.
 $\therefore \frac{300}{\left(\frac{600 - 5x}{18}\right)} = 120 \Rightarrow 5400$
 $= 120(600 - 5x) \Rightarrow x = 111.$
5. (d); Relative speed = (36 + 45) km/hr
 $= \left(81 \times \frac{5}{18}\right)$ m/sec = $\left(\frac{45}{2}\right)$ m/sec
 Length of faster train = $\left(\frac{45}{2} \times 8\right)$ m = 180 m.
6. (d); Since the sum of the length of the train and the engine is needed, so both the lengths must be known.

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7. (c); $2 \text{ kmph} = \left(2 \times \frac{5}{18}\right) \text{ m/sec}$
 $= \frac{5}{9} \text{ m/sec}$ & $4 \text{ kmph} = \frac{10}{9} \text{ m/sec}$
 Let the length of the train be x metres & its speed by y m/sec
 Then, $\frac{x}{\left(y - \frac{5}{9}\right)} = 9$ and $\frac{x}{\left(y - \frac{10}{9}\right)} = 10$
 $\therefore 9y - 5 = x$ and $10(9y - 10) = 9x$
 $\therefore 9y - x = 5$ and $90y - 9x = 100$
 On solving we get $x = 50$.
 \therefore Length of the train is 50 m.

8. (b); Suppose they meet x hours after 7 a.m.
 Distance covered by A in x hours
 $= 20x \text{ km}$.

Distance covered by B in $(x - 1)$ hours
 $= 25(x - 1) \text{ km}$
 $\therefore 20x + 25(x - 1) = 110$
 Or $45x = 135$ or $x = 3$.
 So, they meet at 10 a.m.

9. (c); Relative speed = $(54 + 48) \text{ kmph}$
 $= \left(102 \times \frac{5}{18}\right) \text{ m/sec} = \left(\frac{85}{3}\right) \text{ m/sec}$
 Let the length of the other train be x meters.

Then, $(250 + x) \times \frac{3}{85} = 18$
 Or $750 + 3x = 1530$ or $x = 260 \text{ m}$
 \therefore The length of the other train is 260 m.

10. (b); Let the length of first train be x metres.
 Then, the length of second train is $(x/2)$ metres,
 Relative speed = $(48 + 42) \text{ kmph}$
 $= \left(90 \times \frac{5}{18}\right) \text{ m/sec} = 25 \text{ m/sec}$
 $\therefore \frac{\left(x + \frac{x}{2}\right)}{25} = 12$ or $\frac{3x}{2} = 300$

Or $x = 200$.
 \therefore Length of first train = 200 m
 Let the length of platform by y metres.

Speed of the first train
 $= \left(48 \times \frac{5}{18}\right) \text{ m/sec} = \frac{40}{3} \text{ m/sec}$
 $\therefore (200 + y) \times \frac{3}{40} = 45 \Rightarrow 600 + 3y = 1800$
 $\Rightarrow y = 400 \text{ m}$.

11. (c); Let the speed of second train be x kmph
 Relative speed = $(30 + x) \text{ kmph}$
 $= (30 + x) \times \frac{5}{18} \text{ m/sec}$
 $= \frac{150 + 100}{18} = 25 \text{ m/sec}$
 $\Rightarrow 30 + x = \frac{25 \times 18}{5} = 90$
 $\Rightarrow x = 60 \text{ kmph}$

12. (b); Length of bridge = 1000 m.
 Length of train = 500 m.
 Total distance covered in clearing the bridge = 1500 m.
 Time taken = 120 seconds.

\therefore Speed = $\left(\frac{1500}{120}\right) \text{ m/sec}$
 $= \left(\frac{25}{2} \times \frac{18}{5}\right) \text{ kmph} = 45 \text{ kmph}$.

13. (c); Average speed = $\frac{\text{Total Distance}}{\text{Total Time}}$
 $= \frac{3D}{\frac{D}{V_1} + \frac{D}{V_2} + \frac{D}{V_2}} = \frac{3}{\frac{1}{V_1} + \frac{2}{V_2}} = \frac{3V_1V_2}{2V_1 + V_2}$

14. (d); Let distance be D km
 $\frac{D}{20} = T + \frac{10}{60}$... (i)
 Also $\frac{D}{25} = T + \frac{4}{60}$... (ii)
 From (i) and (ii) we get
 $D \times \frac{1}{100} = \frac{1}{10}$
 $D = \frac{100}{10} = 10 \text{ km}$

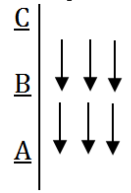
15. (c); 33.33% of speed = $\frac{1}{3}$ of normal speed

$$\frac{D}{S} - \frac{D}{S + \frac{1}{3}S} = \frac{1}{2}$$

$$\frac{1500}{S} - \frac{1500}{\left(\frac{4}{3}\right)S} = \frac{1}{2} \quad \dots \text{(i)}$$

Going through option and (i) we get $S = 750 \text{ km/hour}$

16. (b); Let speed of boat = S_B
 Speed of steam = S_S



Let $AB = D \text{ km}$ then
 $BC = D \text{ km}$
 $AC = 2D \text{ km}$

$$\frac{D}{S_B - S_S} + \frac{D}{S_B + S_S} = \frac{13}{2} \quad \dots \text{(i)}$$

$$\frac{2D}{S_B - S_S} = 9 \quad \dots \text{(ii)}$$

$$\text{So } \frac{D}{S_B - S_S} = \frac{9}{2} \quad \dots \text{(iii)}$$

From (i) and (iii) we get

$$\frac{9}{2} + \frac{D}{S_B + S_S} = \frac{13}{2}$$

$$\frac{D}{S_B + S_S} = 2$$

To go from C to A it takes

$$\frac{2D}{S_B + S_S} = 4 \text{ hours}$$

17. (c); $\frac{30}{S_B - S_S} + \frac{44}{S_B + S_S} = 10$ also

$$\frac{40}{S_B - S_S} + \frac{55}{S_B + S_S} = 13$$

$$\text{Let } \frac{1}{S_B - S_S} = x \text{ and } \frac{1}{S_B + S_S} = y$$

Then

$$30x + 44y = 10 \quad \dots \text{(i)}$$

$$40x + 55y = 13 \quad \dots \text{(ii)}$$

By solving we get

$$S_B = 8 \text{ km/hr}$$

18. (b); $\frac{10}{S_B - 2} + \frac{10}{S_B + 2} = \frac{55}{60} = \frac{11}{12}$... (i)

On solving equation (i) we get

$$S_B = 22 \text{ km/hr}$$

19. (a); $\frac{91}{S_B + S_S} + \frac{91}{S_B - S_S} = 20$

$$\frac{91}{10 + S_S} + \frac{91}{10 - S_S} = 20$$

$$S_S = 3 \text{ km/hr}$$

20. (c); Here, $S_1 = 42$ and $S_2 = 28$.

$$\therefore \text{Stoppage time/hr} = \frac{S_1 - S_2}{S_1} = \frac{42 - 28}{42}$$

$$= \frac{1}{3} \text{ hour} = 20 \text{ minutes}$$

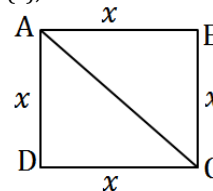
21. (b); Let the required speed by x km/hr

$$\text{Then, } \frac{2 \times 64 \times x}{64 + x} = 56$$

$$\therefore 128x = 64 \times 56 + 56x$$

$$\therefore x = \frac{64 \times 56}{72} = 49.77 \text{ km/hr}$$

22. (c);



Distance covered in $\frac{1}{2}$ hours = $2x$

$$= \frac{1}{2} \times 8 = 4 \text{ km}$$

$$\text{So } x = 2 \Rightarrow \text{area } x^2 = 4 \text{ km}^2$$

23. (a); Speed of the first man = 32 km/hr
 Time taken = $192 \div 32 = 6$ hr
 Second man covers 192 km in 3 hr
 \therefore Speed of the second man
 = $192 \div 3 = 64$ km/hr
 Ratio = 32 : 64 or 1 : 2
24. (c); Distance already covered = $\frac{3}{4} \times 12 = 9$ km
 Time spent = $\frac{2}{3} \times 45$ min = 30 min
 Distance left = $(12 - 9)$ km = 3 km
 Time left = $(45 - 30)$ min = 15 min
 \therefore Required speed = $\frac{3}{15/60}$ km/hr
 = 12 km/hr
25. (b); Total distance covered = $90 \times \frac{5}{18} \times 38 = 950$ m
 So, length of bridge = $950 - 287 = 663$.

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