



THE MATH HUB

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SPEED, DISTANCE & TIME MCQs

100 FULLY SOLVED MCQs

PPSC, FPSC & ONE PAPER EXAMS

NTS • CSS MPT • PMS • Government Job Tests

Average Speed • Relative Speed • Trains • Boats & Streams • Races

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SPEED, DISTANCE & TIME | 100 FULLY SOLVED MCQs

Fast Speed, Distance & Time Foundation

Core triangle

$$S = \frac{D}{T}, \quad D = ST, \quad T = \frac{D}{S}$$

Unit conversion

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

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

Relative speed Opposite directions:

$$S_{rel} = S_1 + S_2$$

Same direction:

$$S_{rel} = |S_1 - S_2|$$

Train crossing Pole/person:

$$T = \frac{L_{train}}{S_{rel}}$$

Platform/train:

$$T = \frac{L_1 + L_2}{S_{rel}}$$

Boats and streams

$$D = B + R, \quad U = B - R$$

$$B = \frac{D + U}{2}, \quad R = \frac{D - U}{2}$$

Exam-speed principle Convert units first. For equal distance questions use inverse speed-time ratios. For trains and meetings, replace two moving bodies by one relative speed. For round trips over equal distances, do not use the simple arithmetic mean unless times are equal.

Average speed

$$\bar{S} = \frac{\text{Total distance}}{\text{Total time}}$$

For equal distances at speeds x, y :

$$\bar{S} = \frac{2xy}{x + y}$$

Basic Speed, Distance, Time & Unit Conversion**MCQ 1**

A car travels 240 km in 6 hours. What is its speed?

- A. 40 km/h B. 36 km/h
C. 48 km/h D. 60 km/h

Solution

$$S = \frac{D}{T}$$

$$S = \frac{240}{6} = 40 \text{ km/h}$$

Final Answer

40 km/h

MCQ 2

A train travels at 100 km/h. How long will it take to cover 25 km?

- A. 0.20 h B. 0.25 h
C. 0.30 h D. 0.50 h

FPSC official practice-paper pattern (adapted).

Solution

$$T = \frac{D}{S}$$

$$T = \frac{25}{100} = 0.25 \text{ h}$$

$$0.25 \text{ h} = 15 \text{ min}$$

Final Answer

0.25 h

MCQ 3

A vehicle moves at 72 km/h for 25 minutes. Find the distance travelled.

- A. 24 km B. 30 km
C. 36 km D. 40 km

Solution

$$25 \text{ min} = \frac{25}{60} = \frac{5}{12} \text{ h}$$

$$D = ST = 72 \left(\frac{5}{12} \right)$$

$$D = 6(5) = 30 \text{ km}$$

Final Answer

30 km

MCQ 4

Convert 54 km/h into m/s.

- A. 12 m/s B. 15 m/s
C. 18 m/s D. 20 m/s

Solution

$$54 \text{ km/h} = 54 \left(\frac{5}{18} \right) \text{ m/s}$$

$$= 3(5) = 15 \text{ m/s}$$

Final Answer

15 m/s

MCQ 5

Convert 20 m/s into km/h.

- A. 64 km/h B. 68 km/h
C. 72 km/h D. 80 km/h

Solution

$$20 \text{ m/s} = 20 \left(\frac{18}{5} \right) \text{ km/h}$$

$$= 4(18) = 72 \text{ km/h}$$

Final Answer

72 km/h

MCQ 6

Convert 90 km/h into centimetres per minute.

- A. 150000 cm/min B. 90000 cm/min
C. 15000 cm/min D. 900000 cm/min

Past-paper pattern (adapted).

Solution

$$90 \text{ km} = 90 \times 100000 = 9000000 \text{ cm}$$

$$1 \text{ h} = 60 \text{ min}$$

$$\frac{9000000}{60} = 150000 \text{ cm/min}$$

Final Answer

150000 cm/min

MCQ 7

A cyclist covers 750 m in 2 minutes 30 seconds. Find the speed in km/h.

- A. 15 km/h B. 16 km/h
C. 18 km/h D. 20 km/h

Past-paper pattern (adapted).

Solution

$$750 \text{ m} = 0.75 \text{ km}$$

$$2 \text{ min } 30 \text{ s} = 2.5 \text{ min} = \frac{2.5}{60} \text{ h} = \frac{1}{24} \text{ h}$$

$$S = \frac{0.75}{1/24} = 0.75(24) = 18 \text{ km/h}$$

Final Answer

18 km/h

MCQ 8

A train travels 16 km in 20 minutes. Find its speed in km/h.

- A. 36 km/h B. 45 km/h
C. 48 km/h D. 50 km/h

Past-paper pattern (adapted).

Solution

$$20 \text{ min} = \frac{1}{3} \text{ h}$$

$$S = \frac{16}{1/3} = 16(3) = 48 \text{ km/h}$$

Final Answer

48 km/h

MCQ 9

A car moves at 36 km/h. How far does it travel in 20 seconds?

- A. 120 m B. 160 m
C. 180 m D. 200 m

Past-paper pattern (adapted).

Solution

$$36 \text{ km/h} = 36 \left(\frac{5}{18} \right) = 10 \text{ m/s}$$

$$D = ST = 10(20) = 200 \text{ m}$$

Final Answer

200 m

MCQ 10

Convert 15 m/s into km/h.

- A. 45 km/h B. 50 km/h
C. 54 km/h D. 60 km/h

Solution

$$15 \left(\frac{18}{5} \right) = 3(18) = 54 \text{ km/h}$$

Final Answer

54 km/h

MCQ 11

A runner covers 1.5 km in 2.5 minutes. Find the speed in km/h.

- A. 30 km/h B. 32 km/h
C. 36 km/h D. 40 km/h

Solution

$$2.5 \text{ min} = \frac{2.5}{60} = \frac{1}{24} \text{ h}$$

$$S = \frac{1.5}{1/24} = 1.5(24) = 36 \text{ km/h}$$

Final Answer

36 km/h

MCQ 12

A car travels at 40 km/h for 2 hours 45 minutes. Find the distance.

- A. 100 km B. 105 km
C. 110 km D. 120 km

Solution

$$2 \text{ h } 45 \text{ min} = 2 + \frac{45}{60} = \frac{11}{4} \text{ h}$$

$$D = 40 \left(\frac{11}{4} \right) = 10(11) = 110 \text{ km}$$

Final Answer

110 km

MCQ 13

A bus maintains 64 km/h for 4.5 hours. Find the distance covered.

- A. 256 km B. 272 km
C. 288 km D. 320 km

Solution

$$D = ST$$

$$D = 64(4.5) = 64\left(\frac{9}{2}\right)$$

$$D = 32(9) = 288 \text{ km}$$

Final Answer

288 km

MCQ 14

A vehicle covers 300 m in 24 seconds. Find its speed in km/h.

- A. 36 km/h B. 40 km/h
C. 45 km/h D. 50 km/h

Solution

$$S = \frac{300}{24} = 12.5 \text{ m/s}$$

$$12.5\left(\frac{18}{5}\right) = 2.5(18) = 45 \text{ km/h}$$

Final Answer

45 km/h

MCQ 15

A car travels at 75 km/h for 1 hour 36 minutes. Find the distance.

- A. 110 km B. 115 km
C. 120 km D. 125 km

Solution

$$1 \text{ h } 36 \text{ min} = 1 + \frac{36}{60} = 1.6 \text{ h}$$

$$D = 75(1.6) = 120 \text{ km}$$

Final Answer

120 km

Speed Change, Early/Late Arrival & Proportionality**MCQ 16**

A man travels at 12 km/h instead of 9 km/h and covers 10 km more in the same time. What distance does he cover at 12 km/h?

- A. 30 km B. 36 km
C. 40 km D. 48 km

Past-paper pattern (adapted).

Solution

$$D_{12} : D_9 = 12 : 9 = 4 : 3$$

$$4x - 3x = 10$$

$$x = 10$$

$$D_{12} = 4x = 40 \text{ km}$$

Final Answer

40 km

MCQ 17

A train covers 180 km. How much time is saved if its speed is increased from 60 km/h to 70 km/h?

- A. 20 min B. 24 min
C. 26 min D. 30 min

Past-paper pattern (adapted).

Solution

$$T_1 = \frac{180}{60} = 3 \text{ h} = 180 \text{ min}$$

$$T_2 = \frac{180}{70} = \frac{18}{7} \text{ h}$$

$$T_2 = \frac{18}{7}(60) = \frac{1080}{7} \approx 154.29 \text{ min}$$

$$\text{Saving} = 180 - 154.29 \approx 25.71 \text{ min}$$

$$\approx 26 \text{ min}$$

Final Answer

26 min (approx.)

MCQ 18

An aeroplane has to cover 600 km at 200 km/h. What is the normal journey time?

- A. 2 h B. 2.5 h
C. 3 h D. 4 h

Past-paper pattern (adapted).

Solution

$$T = \frac{D}{S} = \frac{600}{200} = 3 \text{ h}$$

Final Answer

3 h

MCQ 19

For a fixed distance, a car takes 1 hour less at 75 km/h than at 60 km/h. Find the distance.

- A. 240 km B. 300 km
C. 360 km D. 450 km

Solution

$$\begin{aligned}\frac{D}{60} - \frac{D}{75} &= 1 \\ D \left(\frac{75 - 60}{4500} \right) &= 1 \\ D \left(\frac{15}{4500} \right) &= 1 \\ \frac{D}{300} &= 1 \\ D &= 300 \text{ km}\end{aligned}$$

Final Answer

300 km

MCQ 20

If speed is increased by 20% for the same distance, by what percentage does time decrease?

- A. $16\frac{2}{3}\%$ B. 20%
C. 25% D. $33\frac{1}{3}\%$

Solution

$$\begin{aligned}\text{Old speed} &= 100 \\ \text{New speed} &= 120 \\ \text{Time ratio} &= \frac{100}{120} = \frac{5}{6} \\ \text{Decrease} &= 1 - \frac{5}{6} = \frac{1}{6} \\ \frac{1}{6} \times 100 &= 16\frac{2}{3} \\ \text{Decrease} &= 16\frac{2}{3} \text{ percent}\end{aligned}$$

Final Answer $16\frac{2}{3}\%$ **MCQ 21**

If speed decreases by 25% for the same distance, by what percentage does time increase?

- A. 25% B. 30%
C. $33\frac{1}{3}\%$ D. 40%

Solution

$$\begin{aligned}\text{Old speed} &= 100, \quad \text{New speed} = 75 \\ \text{Time factor} &= \frac{100}{75} = \frac{4}{3} \\ \text{Increase} &= \frac{4}{3} - 1 = \frac{1}{3} \\ \frac{1}{3} \times 100 &= 33\frac{1}{3} \\ \text{Increase} &= 33\frac{1}{3} \text{ percent}\end{aligned}$$

Final Answer $33\frac{1}{3}\%$ **MCQ 22**

A journey takes 4 hours at 45 km/h. What speed is required to complete the same journey in 3 hours?

- A. 55 km/h B. 60 km/h
C. 65 km/h D. 70 km/h

Solution

$$\begin{aligned}D &= 45(4) = 180 \text{ km} \\ S &= \frac{180}{3} = 60 \text{ km/h}\end{aligned}$$

Final Answer

60 km/h

MCQ 23

At 50 km/h a driver is 30 minutes late; at 60 km/h the driver is 10 minutes early. Find the journey distance.

- A. 150 km B. 180 km
C. 200 km D. 240 km

Solution

$$\text{Time difference} = 30 + 10 = 40 \text{ min} = \frac{2}{3} \text{ h}$$

$$\frac{D}{50} - \frac{D}{60} = \frac{2}{3}$$

$$D \left(\frac{10}{3000} \right) = \frac{2}{3}$$

$$\frac{D}{300} = \frac{2}{3}$$

$$D = 200 \text{ km}$$

Final Answer

200 km

MCQ 24

At 5 km/h a person is 8 minutes late; at 6 km/h the person is 2 minutes early. Find the distance.

- A. 4 km B. 5 km
C. 6 km D. 7 km

Solution

$$\text{Time difference} = 8 + 2 = 10 \text{ min} = \frac{1}{6} \text{ h}$$

$$\frac{D}{5} - \frac{D}{6} = \frac{1}{6}$$

$$D \left(\frac{1}{30} \right) = \frac{1}{6}$$

$$D = 5 \text{ km}$$

Final Answer

5 km

MCQ 25

For the same distance, speeds are in the ratio 3 : 4. What is the corresponding ratio of times?

- A. 3:4 B. 4:3
C. 9:16 D. 16:9

Solution

$$T \propto \frac{1}{S}$$

$$T_1 : T_2 = S_2 : S_1$$

$$= 4 : 3$$

Final Answer

4 : 3

Average Speed**MCQ 26**

A car travels from A to B at 60 km/h and returns over the same distance at 40 km/h. Find the average speed.

- A. 45 km/h B. 48 km/h
C. 50 km/h D. 52 km/h

Solution

$$\bar{S} = \frac{2xy}{x+y}$$

$$= \frac{2(60)(40)}{60+40}$$

$$= \frac{4800}{100} = 48 \text{ km/h}$$

Final Answer

48 km/h

MCQ 27

A vehicle runs for equal times at 30 km/h and 60 km/h. Find the average speed.

- A. 40 km/h B. 45 km/h
C. 48 km/h D. 50 km/h

Solution

$$\text{Equal times} \Rightarrow \bar{S} = \frac{30+60}{2}$$

$$= 45 \text{ km/h}$$

Final Answer

45 km/h

MCQ 28

A car covers 120 km at 40 km/h and another 120 km at 60 km/h. Find the average speed.

- A. 45 km/h B. 48 km/h
C. 50 km/h D. 52 km/h

Solution

$$T_1 = \frac{120}{40} = 3 \text{ h}$$

$$T_2 = \frac{120}{60} = 2 \text{ h}$$

$$\bar{S} = \frac{120+120}{3+2} = \frac{240}{5} = 48 \text{ km/h}$$

Final Answer

48 km/h

MCQ 29

A vehicle travels 2 hours at 50 km/h and 3 hours at 70 km/h. Find its average speed.

- A. 58 km/h B. 60 km/h
C. 62 km/h D. 64 km/h

Solution

$$D_1 = 50(2) = 100$$

$$D_2 = 70(3) = 210$$

$$\bar{S} = \frac{100 + 210}{2 + 3} = \frac{310}{5} = 62 \text{ km/h}$$

Final Answer

62 km/h

MCQ 30

Half of a journey is covered at 30 km/h and the other half at 60 km/h. Find the average speed.

- A. 36 km/h B. 40 km/h
C. 45 km/h D. 48 km/h

Solution

$$\bar{S} = \frac{2(30)(60)}{30 + 60}$$

$$= \frac{3600}{90} = 40 \text{ km/h}$$

Final Answer

40 km/h

MCQ 31

Three equal distances are travelled at 30, 40, and 60 km/h. Find the average speed.

- A. 36 km/h B. 40 km/h
C. 42 km/h D. 45 km/h

Solution

$$\bar{S} = \frac{3}{\frac{1}{30} + \frac{1}{40} + \frac{1}{60}}$$

$$= \frac{3}{\frac{4+3+2}{120}}$$

$$= \frac{3}{9/120} = 40 \text{ km/h}$$

Final Answer

40 km/h

MCQ 32

A car travels for equal times at 40, 50, and 60 km/h. Find the average speed.

- A. 48 km/h B. 50 km/h
C. 52 km/h D. 54 km/h

Solution

$$\text{Equal times} \Rightarrow \bar{S} = \frac{40 + 50 + 60}{3}$$

$$= \frac{150}{3} = 50 \text{ km/h}$$

Final Answer

50 km/h

MCQ 33

A car covers 100 km at 50 km/h and 150 km at 75 km/h. Find its average speed.

- A. 60 km/h B. 62.5 km/h
C. 65 km/h D. 67.5 km/h

Solution

$$T_1 = \frac{100}{50} = 2 \text{ h}$$

$$T_2 = \frac{150}{75} = 2 \text{ h}$$

$$\bar{S} = \frac{250}{4} = 62.5 \text{ km/h}$$

Final Answer

62.5 km/h

MCQ 34

A bus covers 90 km in 1.5 hours and 120 km in 2 hours. Find the average speed.

- A. 55 km/h B. 60 km/h
C. 62 km/h D. 65 km/h

Solution

$$D = 90 + 120 = 210 \text{ km}$$

$$T = 1.5 + 2 = 3.5 \text{ h}$$

$$\bar{S} = \frac{210}{3.5} = 60 \text{ km/h}$$

Final Answer

60 km/h

MCQ 35

A traveller spends half the total time at 20 km/h and half at 80 km/h. Find the average speed.

- A. 40 km/h B. 45 km/h
C. 50 km/h D. 55 km/h

Solution

$$\begin{aligned}\text{Equal times} \Rightarrow \bar{S} &= \frac{20 + 80}{2} \\ &= 50 \text{ km/h}\end{aligned}$$

Final Answer

50 km/h

Relative Speed, Meeting & Catch-Up**MCQ 36**

Two cars start 300 km apart and move toward each other at 60 km/h and 40 km/h. When do they meet?

- A. 2 h B. 2.5 h
C. 3 h D. 4 h

Solution

$$S_{rel} = 60 + 40 = 100 \text{ km/h}$$

$$T = \frac{300}{100} = 3 \text{ h}$$

Final Answer

3 h

MCQ 37

A car at 80 km/h is 100 km behind a car moving in the same direction at 60 km/h. How long will it take to catch it?

- A. 4 h B. 5 h
C. 6 h D. 8 h

Solution

$$S_{rel} = 80 - 60 = 20 \text{ km/h}$$

$$T = \frac{100}{20} = 5 \text{ h}$$

Final Answer

5 h

MCQ 38

Two walkers move toward each other at 5 km/h and 7 km/h from points 36 km apart. Find the meeting time.

- A. 2 h B. 2.5 h
C. 3 h D. 4 h

Solution

$$S_{rel} = 5 + 7 = 12 \text{ km/h}$$

$$T = \frac{36}{12} = 3 \text{ h}$$

Final Answer

3 h

MCQ 39

Two vehicles move in the same direction at 72 km/h and 54 km/h. If the faster one is 90 km behind, when will it catch the slower one?

- A. 4 h B. 5 h
C. 6 h D. 7 h

Solution

$$S_{rel} = 72 - 54 = 18 \text{ km/h}$$

$$T = \frac{90}{18} = 5 \text{ h}$$

Final Answer

5 h

MCQ 40

Two cyclists start from the same point in opposite directions at 15 km/h and 18 km/h. How far apart are they after 2 hours?

- A. 60 km B. 64 km
C. 66 km D. 72 km

Solution

$$S_{rel} = 15 + 18 = 33 \text{ km/h}$$

$$D = 33(2) = 66 \text{ km}$$

Final Answer

66 km

MCQ 41

Two cars move in opposite directions at 100 km/h and 80 km/h. How far apart will they be after 2.5 hours?

- A. 400 km B. 420 km
C. 450 km D. 480 km

Solution

$$S_{rel} = 100 + 80 = 180 \text{ km/h}$$

$$D = 180(2.5) = 450 \text{ km}$$

Final Answer

450 km

MCQ 42

A person walks at 6 km/h. One hour later a runner follows at 10 km/h. How long after starting will the runner catch the person?

- A. 1 h B. 1.5 h
C. 2 h D. 2.5 h

Solution

$$\text{Initial gap} = 6(1) = 6 \text{ km}$$

$$S_{rel} = 10 - 6 = 4 \text{ km/h}$$

$$T = \frac{6}{4} = 1.5 \text{ h}$$

Final Answer

1.5 h

MCQ 43

Two persons start 84 km apart and move toward each other at 8 km/h and 6 km/h. Find the meeting time.

- A. 5 h B. 6 h
C. 7 h D. 8 h

Solution

$$S_{rel} = 8 + 6 = 14 \text{ km/h}$$

$$T = \frac{84}{14} = 6 \text{ h}$$

Final Answer

6 h

MCQ 44

A faster cyclist moves at 24 km/h and a slower cyclist at 18 km/h in the same direction. What gap is closed in 2 hours?

- A. 10 km B. 12 km
C. 14 km D. 16 km

Solution

$$S_{rel} = 24 - 18 = 6 \text{ km/h}$$

$$D = 6(2) = 12 \text{ km}$$

Final Answer

12 km

MCQ 45

Two travellers start from opposite ends of a 300 km route at 40 km/h and 60 km/h. How far does the slower traveller cover before they meet?

- A. 100 km B. 120 km
C. 150 km D. 180 km

Solution

$$T = \frac{300}{40 + 60} = 3 \text{ h}$$

$$D_{\text{slow}} = 40(3) = 120 \text{ km}$$

Final Answer

120 km

Trains, Platforms & Overtaking**MCQ 46**

A 120 m long train moves at 54 km/h. How long does it take to pass a pole?

- A. 6 s B. 8 s
C. 10 s D. 12 s

Solution

$$54 \text{ km/h} = 15 \text{ m/s}$$

$$T = \frac{120}{15} = 8 \text{ s}$$

Final Answer

8 s

MCQ 47

A 150 m long train moves at 72 km/h. How long does it take to pass a pole?

- A. 6 s B. 7.5 s
C. 8 s D. 10 s

Solution

$$72 \text{ km/h} = 20 \text{ m/s}$$

$$T = \frac{150}{20} = 7.5 \text{ s}$$

Final Answer

7.5 s

MCQ 48

A 180 m train at 54 km/h crosses a 120 m platform. Find the time.

- A. 15 s B. 18 s
C. 20 s D. 24 s

Solution

$$\text{Total distance} = 180 + 120 = 300 \text{ m}$$

$$54 \text{ km/h} = 15 \text{ m/s}$$

$$T = \frac{300}{15} = 20 \text{ s}$$

Final Answer

20 s

MCQ 49

A 100 m train at 72 km/h crosses a 200 m platform. Find the time.

- A. 12 s B. 15 s
C. 18 s D. 20 s

Solution

$$D = 100 + 200 = 300 \text{ m}$$

$$72 \text{ km/h} = 20 \text{ m/s}$$

$$T = \frac{300}{20} = 15 \text{ s}$$

Final Answer

15 s

MCQ 50

A 150 m train moving at 54 km/h passes a man walking at 6 km/h in the opposite direction. Find the time.

- A. 8 s B. 9 s
C. 10 s D. 12 s

Solution

$$S_{rel} = 54 + 6 = 60 \text{ km/h}$$

$$60 \text{ km/h} = \frac{50}{3} \text{ m/s}$$

$$T = \frac{150}{50/3} = 150 \left(\frac{3}{50} \right) = 9 \text{ s}$$

Final Answer

9 s

MCQ 51

A 150 m train moving at 54 km/h overtakes a man walking at 6 km/h in the same direction. Find the time.

- A. 9 s B. 10 s
C. 11.25 s D. 12.5 s

Solution

$$S_{rel} = 54 - 6 = 48 \text{ km/h}$$

$$48 \text{ km/h} = \frac{40}{3} \text{ m/s}$$

$$T = \frac{150}{40/3} = 150 \left(\frac{3}{40} \right) = 11.25 \text{ s}$$

Final Answer

11.25 s

MCQ 52

Two trains of lengths 120 m and 180 m move in opposite directions at 54 km/h and 36 km/h. Find the crossing time.

- A. 10 s B. 12 s
C. 15 s D. 18 s

Solution

$$D = 120 + 180 = 300 \text{ m}$$

$$S_{rel} = 54 + 36 = 90 \text{ km/h} = 25 \text{ m/s}$$

$$T = \frac{300}{25} = 12 \text{ s}$$

Final Answer

12 s

MCQ 53

Two trains of lengths 150 m and 100 m move in the same direction at 72 km/h and 54 km/h. How long does the faster train take to completely overtake the slower?

- A. 40 s B. 45 s
C. 50 s D. 60 s

Solution

$$D = 150 + 100 = 250 \text{ m}$$

$$S_{rel} = 72 - 54 = 18 \text{ km/h} = 5 \text{ m/s}$$

$$T = \frac{250}{5} = 50 \text{ s}$$

Final Answer

50 s

MCQ 54

Two trains move in opposite directions at 62 km/h and 40 km/h. One train is 260 m long and they cross in 18 s. Find the length of the other train.

- A. 220 m B. 240 m
C. 250 m D. 260 m

Past-paper pattern (adapted).

Solution

$$S_{rel} = 62 + 40 = 102 \text{ km/h}$$

$$102 \left(\frac{5}{18} \right) = \frac{85}{3} \text{ m/s}$$

$$\text{Total length} = \frac{85}{3} (18) = 510 \text{ m}$$

$$L = 510 - 260 = 250 \text{ m}$$

Final Answer

250 m

MCQ 55

A 180 m train moves at 54 km/h and crosses a platform in 24 s. Find the platform length.

- A. 160 m B. 180 m
C. 200 m D. 220 m

Solution

$$54 \text{ km/h} = 15 \text{ m/s}$$

$$\text{Total distance} = 15(24) = 360 \text{ m}$$

$$\text{Platform} = 360 - 180 = 180 \text{ m}$$

Final Answer

180 m

MCQ 56

A train at 54 km/h passes a pole in 12 s. How long will it take to cross a 180 m platform?

- A. 18 s B. 20 s
C. 22 s D. 24 s

Solution

$$54 \text{ km/h} = 15 \text{ m/s}$$

$$L_{\text{train}} = 15(12) = 180 \text{ m}$$

$$D = 180 + 180 = 360 \text{ m}$$

$$T = \frac{360}{15} = 24 \text{ s}$$

Final Answer

24 s

MCQ 57

A train at 72 km/h crosses a 300 m bridge in 25 s. Find the train length.

- A. 180 m B. 200 m
C. 220 m D. 250 m

Solution

$$72 \text{ km/h} = 20 \text{ m/s}$$

$$\text{Total distance} = 20(25) = 500 \text{ m}$$

$$L_{\text{train}} = 500 - 300 = 200 \text{ m}$$

Final Answer

200 m

MCQ 58

Two equal-length trains move in opposite directions at 45 km/h and 63 km/h and cross in 10 s. Find the length of each train.

- A. 120 m B. 135 m
C. 150 m D. 180 m

Solution

$$S_{\text{rel}} = 45 + 63 = 108 \text{ km/h} = 30 \text{ m/s}$$

$$\text{Total length} = 30(10) = 300 \text{ m}$$

$$2L = 300$$

$$L = 150 \text{ m}$$

Final Answer

150 m

MCQ 59

Two trains, 180 m and 220 m long, move in the same direction at 72 km/h and 54 km/h. Find the complete overtaking time.

- A. 60 s B. 70 s
C. 80 s D. 90 s

Solution

$$D = 180 + 220 = 400 \text{ m}$$

$$S_{\text{rel}} = 18 \text{ km/h} = 5 \text{ m/s}$$

$$T = \frac{400}{5} = 80 \text{ s}$$

Final Answer

80 s

MCQ 60

A 250 m train passes a pole in 10 s. Find its speed.

- A. 72 km/h B. 80 km/h
C. 90 km/h D. 100 km/h

Solution

$$S = \frac{250}{10} = 25 \text{ m/s}$$

$$25 \left(\frac{18}{5} \right) = 90 \text{ km/h}$$

Final Answer

90 km/h

Boats & Streams**MCQ 61**

A boat moves downstream at 6 km/h and upstream at 4 km/h. Find the speed of the stream.

- A. 1 km/h B. 2 km/h
C. 3 km/h D. 5 km/h

Past-paper pattern (adapted).

Solution

$$S_{\text{stream}} = \frac{D - U}{2}$$

$$= \frac{6 - 4}{2} = 1 \text{ km/h}$$

Final Answer

1 km/h

MCQ 62

A boat moves downstream at 10 km/h and upstream at 6 km/h. Find its speed in still water.

- A. 7 km/h B. 8 km/h
C. 9 km/h D. 10 km/h

Solution

$$S_{\text{boat}} = \frac{D + U}{2}$$

$$= \frac{10 + 6}{2} = 8 \text{ km/h}$$

Final Answer

8 km/h

MCQ 63

A boat moves at 12 km/h in still water and the stream speed is 3 km/h. Find downstream and upstream speeds.

- A. 15, 9 km/h B. 14, 10 km/h
C. 12, 3 km/h D. 9, 15 km/h

Solution

$$D = 12 + 3 = 15 \text{ km/h}$$

$$U = 12 - 3 = 9 \text{ km/h}$$

Final Answer

15 km/h, 9 km/h

MCQ 64

A boat covers 72 km downstream at 12 km/h. Find the time.

- A. 5 h B. 6 h
C. 7 h D. 8 h

Solution

$$T = \frac{72}{12} = 6 \text{ h}$$

Final Answer

6 h

MCQ 65

A boat covers 48 km upstream at 8 km/h. Find the time.

- A. 4 h B. 5 h
C. 6 h D. 8 h

Solution

$$T = \frac{48}{8} = 6 \text{ h}$$

Final Answer

6 h

MCQ 66

A boat moves at 10 km/h in still water and the stream at 2 km/h. How long does it take to go 36 km downstream and 24 km upstream?

- A. 5 h B. 6 h
C. 7 h D. 8 h

Solution

$$D = 10 + 2 = 12 \text{ km/h}$$

$$U = 10 - 2 = 8 \text{ km/h}$$

$$T = \frac{36}{12} + \frac{24}{8} = 3 + 3 = 6 \text{ h}$$

Final Answer

6 h

MCQ 67

A boat covers 60 km downstream in 5 hours and the same distance upstream in 10 hours. Find the speed in still water.

- A. 8 km/h B. 9 km/h
C. 10 km/h D. 12 km/h

Solution

$$D = \frac{60}{5} = 12 \text{ km/h}$$

$$U = \frac{60}{10} = 6 \text{ km/h}$$

$$S_{\text{boat}} = \frac{12 + 6}{2} = 9 \text{ km/h}$$

Final Answer

9 km/h

MCQ 68

A rower covers 30 km downstream in 2 hours and 30 km upstream in 3 hours. Find the stream speed.

- A. 2 km/h B. 2.5 km/h
C. 3 km/h D. 5 km/h

Solution

$$D = \frac{30}{2} = 15 \text{ km/h}$$

$$U = \frac{30}{3} = 10 \text{ km/h}$$

$$S_{\text{stream}} = \frac{15 - 10}{2} = 2.5 \text{ km/h}$$

Final Answer

2.5 km/h

MCQ 69

A boat has downstream speed 10 km/h and the stream speed is 2 km/h. Find its upstream speed.

- A. 4 km/h B. 6 km/h
C. 8 km/h D. 12 km/h

Solution

$$S_{\text{boat}} = 10 - 2 = 8 \text{ km/h}$$

$$U = 8 - 2 = 6 \text{ km/h}$$

Final Answer

6 km/h

MCQ 70

A boat moves at 15 km/h in still water and the stream at 5 km/h. Find the total time for 80 km downstream and 40 km upstream.

- A. 6 h B. 7 h
C. 8 h D. 9 h

Solution

$$D = 15 + 5 = 20 \text{ km/h}$$

$$U = 15 - 5 = 10 \text{ km/h}$$

$$T = \frac{80}{20} + \frac{40}{10} = 4 + 4 = 8 \text{ h}$$

Final Answer

8 h

Races & Circular Tracks**MCQ 71**

In a 400 m race, A runs at 12 km/h and B at 10 km/h. By how many metres does A beat B?

- A. 50 m B. 60 m
C. $66\frac{2}{3}$ m D. 80 m

Solution

$$12 \text{ km/h} : 10 \text{ km/h} = 6 : 5$$

$$\text{When A runs 400, } B = 400 \left(\frac{5}{6} \right) = \frac{1000}{3} \text{ m}$$

$$\text{Lead} = 400 - \frac{1000}{3} = \frac{200}{3} = 66\frac{2}{3} \text{ m}$$

Final Answer

$$66\frac{2}{3} \text{ m}$$

MCQ 72

In a 100 m race, A runs at 10 m/s and B at 8 m/s. By how many metres does A beat B?

- A. 10 m B. 15 m
C. 20 m D. 25 m

Solution

$$T_A = \frac{100}{10} = 10 \text{ s}$$

$$D_B = 8(10) = 80 \text{ m}$$

$$\text{Lead} = 100 - 80 = 20 \text{ m}$$

Final Answer

$$20 \text{ m}$$

MCQ 73

A gives B a 20 m start in a 100 m race and they finish together. Find the speed ratio A : B.

- A. 4:5 B. 5:4
C. 3:2 D. 2:1

Solution

$$\begin{aligned} \text{Same time} \Rightarrow S_A : S_B &= D_A : D_B \\ &= 100 : 80 = 5 : 4 \end{aligned}$$

Final Answer

$$5 : 4$$

MCQ 74

Two runners move on a 400 m circular track in the same direction at 5 m/s and 3 m/s. After how long will the faster runner gain one complete lap?

- A. 150 s B. 180 s
C. 200 s D. 240 s

Solution

$$S_{rel} = 5 - 3 = 2 \text{ m/s}$$

$$T = \frac{400}{2} = 200 \text{ s}$$

Final Answer

$$200 \text{ s}$$

MCQ 75

Two runners move in opposite directions on a 360 m circular track at 4 m/s and 5 m/s. After how long do they meet?

- A. 36 s B. 40 s
C. 45 s D. 60 s

Solution

$$S_{rel} = 4 + 5 = 9 \text{ m/s}$$

$$T = \frac{360}{9} = 40 \text{ s}$$

Final Answer

$$40 \text{ s}$$

MCQ 76

Two runners move in the same direction on a 600 m track at 6 m/s and 4 m/s. Find the time for the faster runner to gain one lap.

- A. 4 min B. 5 min
C. 6 min D. 7 min

Solution

$$S_{rel} = 6 - 4 = 2 \text{ m/s}$$

$$T = \frac{600}{2} = 300 \text{ s}$$

$$300 \text{ s} = 5 \text{ min}$$

Final Answer

$$5 \text{ min}$$

MCQ 77

A and B run 1 km at 12 km/h and 10 km/h. What is the difference in their finishing times?

- A. 30 s B. 45 s
C. 1 min D. 1.5 min

Solution

$$T_A = \frac{1}{12} \text{ h} = 5 \text{ min}$$

$$T_B = \frac{1}{10} \text{ h} = 6 \text{ min}$$

$$\text{Difference} = 1 \text{ min}$$

Final Answer

1 min

MCQ 78

In an 800 m race, A runs at 8 m/s and B at 6.4 m/s. By how many metres does A beat B?

- A. 120 m B. 140 m
C. 160 m D. 180 m

Solution

$$T_A = \frac{800}{8} = 100 \text{ s}$$

$$D_B = 6.4(100) = 640 \text{ m}$$

$$\text{Lead} = 800 - 640 = 160 \text{ m}$$

Final Answer

160 m

MCQ 79

Two runners move in opposite directions on a 500 m track at 10 m/s and 15 m/s. Find their first meeting time.

- A. 15 s B. 20 s
C. 25 s D. 30 s

Solution

$$S_{rel} = 10 + 15 = 25 \text{ m/s}$$

$$T = \frac{500}{25} = 20 \text{ s}$$

Final Answer

20 s

MCQ 80

Two runners move in the same direction on a 300 m circular track at 5 m/s and 7 m/s. Find the time between successive meetings.

- A. 120 s B. 150 s
C. 180 s D. 210 s

Solution

$$S_{rel} = 7 - 5 = 2 \text{ m/s}$$

$$T = \frac{300}{2} = 150 \text{ s}$$

Final Answer

150 s

Wheels, Revolutions & Distance Applications**MCQ 81**

A wheel has diameter 70 cm. Using $\pi = \frac{22}{7}$, how many revolutions are needed to cover 220 m?

- A. 50 B. 75
C. 100 D. 125

Solution

$$\text{Circumference} = \pi d = \frac{22}{7}(70) = 220 \text{ cm} = 2.2 \text{ m}$$

$$N = \frac{220}{2.2} = 100$$

Final Answer

100 revolutions

MCQ 82

A wheel has diameter 28 cm. Using $\pi = \frac{22}{7}$, how many revolutions are needed to cover 88 m?

- A. 80 B. 90
C. 100 D. 110

Solution

$$C = \frac{22}{7}(28) = 88 \text{ cm} = 0.88 \text{ m}$$

$$N = \frac{88}{0.88} = 100$$

Final Answer

100 revolutions

MCQ 83

A wheel has radius 35 cm. Using $\pi = \frac{22}{7}$, what distance does it cover in 100 revolutions?

- A. 180 m B. 200 m
C. 220 m D. 240 m

Solution

$$C = 2\pi r = 2\left(\frac{22}{7}\right)(35) = 220 \text{ cm} = 2.2 \text{ m}$$

$$D = 100(2.2) = 220 \text{ m}$$

Final Answer

220 m

MCQ 84

A wheel of circumference 2 m rotates at 150 revolutions per minute. Find its linear speed in km/h.

- A. 15 km/h B. 18 km/h
C. 20 km/h D. 24 km/h

Solution

$$D \text{ per min} = 2(150) = 300 \text{ m}$$

$$300 \text{ m/min} = 0.3 \text{ km/min}$$

$$S = 0.3(60) = 18 \text{ km/h}$$

Final Answer

18 km/h

MCQ 85

A wheel has diameter 56 cm and makes 250 revolutions per minute. Using $\pi = \frac{22}{7}$, find the speed in km/h.

- A. 24 km/h B. 26.4 km/h
C. 28.8 km/h D. 30 km/h

Solution

$$C = \frac{22}{7}(56) = 176 \text{ cm} = 1.76 \text{ m}$$

$$D \text{ per min} = 1.76(250) = 440 \text{ m}$$

$$S = 440(60) = 26400 \text{ m/h} = 26.4 \text{ km/h}$$

Final Answer

26.4 km/h

MCQ 86

A car wheel has diameter 70 cm. Using $\pi = \frac{22}{7}$, how many revolutions does it make while travelling 1.1 km?

- A. 400 B. 450
C. 500 D. 550

Solution

$$C = \frac{22}{7}(70) = 220 \text{ cm} = 2.2 \text{ m}$$

$$1.1 \text{ km} = 1100 \text{ m}$$

$$N = \frac{1100}{2.2} = 500$$

Final Answer

500 revolutions

MCQ 87

Two wheels have circumferences 2 m and 2.5 m. Over 100 m, how many more revolutions does the smaller wheel make?

- A. 5 B. 10
C. 15 D. 20

Solution

$$N_1 = \frac{100}{2} = 50$$

$$N_2 = \frac{100}{2.5} = 40$$

$$\text{Difference} = 50 - 40 = 10$$

Final Answer

10 revolutions

MCQ 88

A vehicle moves at 60 km/h. If the wheel circumference is 2 m, approximately how many revolutions per second does the wheel make?

- A. 6.67 B. 8.33
C. 10 D. 12.5

Solution

$$60 \text{ km/h} = \frac{50}{3} \text{ m/s}$$

$$N = \frac{50/3}{2} = \frac{25}{3}$$

$$\approx 8.33 \text{ rev/s}$$

Final Answer

8.33 rev/s (approx.)

MCQ 89

A ball is dropped from a height of 75 m and rebounds each time to $\frac{2}{5}$ of the previous fall. Find the total distance before coming to rest.

- A. 165 m B. 170 m
C. 175 m D. 180 m

Past-paper pattern (adapted).

Solution

$$H = 75, \quad r = \frac{2}{5}$$

$$D = H + 2Hr + 2Hr^2 + \dots$$

$$= H + 2H \left(\frac{r}{1-r} \right)$$

$$= 75 + 150 \left(\frac{2/5}{3/5} \right)$$

$$= 75 + 150 \left(\frac{2}{3} \right) = 175 \text{ m}$$

Final Answer

175 m

MCQ 90

A person walks around a square park of side 200 m in 8 minutes. Find the speed in km/h.

- A. 5 km/h B. 6 km/h
C. 7.5 km/h D. 8 km/h

Solution

$$\text{Perimeter} = 4(200) = 800 \text{ m} = 0.8 \text{ km}$$

$$8 \text{ min} = \frac{8}{60} = \frac{2}{15} \text{ h}$$

$$S = \frac{0.8}{2/15} = 0.8 \left(\frac{15}{2} \right) = 6 \text{ km/h}$$

Final Answer

6 km/h

Mixed High-Yield One-Paper Problems**MCQ 91**

One-third of a journey is covered at 30 km/h and the remaining two-thirds at 60 km/h. Find the average speed.

- A. 40 km/h B. 45 km/h
C. 48 km/h D. 50 km/h

Solution

Take total distance = 90 km

$$30 \text{ km at } 30 \Rightarrow T_1 = 1 \text{ h}$$

$$60 \text{ km at } 60 \Rightarrow T_2 = 1 \text{ h}$$

$$\bar{S} = \frac{90}{2} = 45 \text{ km/h}$$

Final Answer

45 km/h

MCQ 92

A car covers the first 100 km at 50 km/h and the next 100 km at 100 km/h. Find the average speed.

- A. 60 km/h B. $66\frac{2}{3}$ km/h
C. 70 km/h D. 75 km/h

Solution

$$T_1 = \frac{100}{50} = 2 \text{ h}$$

$$T_2 = \frac{100}{100} = 1 \text{ h}$$

$$\bar{S} = \frac{200}{3} = 66\frac{2}{3} \text{ km/h}$$

Final Answer $66\frac{2}{3} \text{ km/h}$ **MCQ 93**

A bus moves at 60 km/h when running, but its average speed including stoppages is 50 km/h. How many minutes does it stop per hour of running time?

- A. 6 min B. 10 min
C. 12 min D. 15 min

Solution

In 1 running hour, distance = 60 km

$$\text{Total elapsed time} = \frac{60}{50} = 1.2 \text{ h}$$

$$\text{Stoppage} = 1.2 - 1 = 0.2 \text{ h}$$

$$0.2(60) = 12 \text{ min}$$

Final Answer

12 min

MCQ 94

A journey of 120 km takes 1 hour longer at 40 km/h than at 60 km/h. Which calculation verifies this?

- A. $3 - 2 = 1 \text{ h}$ B. $4 - 2 = 2 \text{ h}$
C. $3 - 1 = 2 \text{ h}$ D. $2.5 - 2 = 0.5 \text{ h}$

Solution

$$T_{40} = \frac{120}{40} = 3 \text{ h}$$

$$T_{60} = \frac{120}{60} = 2 \text{ h}$$

$$T_{40} - T_{60} = 3 - 2 = 1 \text{ h}$$

Final Answer $3 - 2 = 1 \text{ h}$ **MCQ 95**

A car must travel 300 km. It drives the first 2 hours at 60 km/h, then the rest at 80 km/h. Find the total time.

- A. 4 h B. 4 h 15 min
C. 4 h 30 min D. 5 h

Solution

$$D_1 = 60(2) = 120 \text{ km}$$

$$D_{\text{rem}} = 300 - 120 = 180 \text{ km}$$

$$T_{\text{rem}} = \frac{180}{80} = 2.25 \text{ h} = 2 \text{ h } 15 \text{ min}$$

$$T = 2 + 2.25 = 4.25 \text{ h}$$

Final Answer

4 h 15 min

MCQ 96

A car moves for 2 hours at 50 km/h, stops for 30 minutes, then moves for 2 hours at 75 km/h. Find the average speed for the whole elapsed time.

- A. 50 km/h B. 55.56 km/h
C. 60 km/h D. 62.5 km/h

Solution

$$D = 50(2) + 75(2) = 100 + 150 = 250 \text{ km}$$

$$T = 2 + 0.5 + 2 = 4.5 \text{ h}$$

$$\bar{S} = \frac{250}{4.5} = 55.56 \text{ km/h (approx.)}$$

Final Answer

55.56 km/h (approx.)

MCQ 97

For a 120 km journey, increasing speed by 10 km/h reduces time by 1 hour. Find the original speed.

- A. 20 km/h B. 30 km/h
C. 40 km/h D. 50 km/h

Solution

$$\frac{120}{v} - \frac{120}{v+10} = 1$$

$$\frac{1200}{v(v+10)} = 1$$

$$v(v+10) = 1200$$

$$v^2 + 10v - 1200 = 0$$

$$(v-30)(v+40) = 0$$

$$v = 30 \text{ km/h}$$

Final Answer

30 km/h

MCQ 98

If speed is reduced by 20%, a journey takes 30 minutes longer. What was the original journey time?

- A. 1.5 h B. 2 h
C. 2.5 h D. 3 h

Solution

$$\text{New speed} = 0.8 \times \text{old speed}$$

$$\text{New time} = \frac{100}{80}T = 1.25T$$

$$1.25T - T = 0.5 \text{ h}$$

$$0.25T = 0.5$$

$$T = 2 \text{ h}$$

Final Answer

2 h

MCQ 99

Two-thirds of a journey is covered at 40 km/h and the remaining one-third at 60 km/h. Find the average speed.

- A. 42 km/h B. 45 km/h
C. 48 km/h D. 50 km/h

Solution

Take total distance = 120 km

$$80 \text{ km at } 40 \Rightarrow T_1 = 2 \text{ h}$$

$$40 \text{ km at } 60 \Rightarrow T_2 = \frac{2}{3} \text{ h}$$

$$T = 2 + \frac{2}{3} = \frac{8}{3} \text{ h}$$

$$\bar{S} = \frac{120}{8/3} = 45 \text{ km/h}$$

Final Answer

45 km/h

MCQ 100

A traveller goes from A to B at 72 km/h and returns over the same distance at 48 km/h. Find the average speed for the round trip.

- A. 54 km/h B. 56 km/h
C. 57.6 km/h D. 60 km/h

Solution

$$\bar{S} = \frac{2xy}{x+y}$$

$$= \frac{2(72)(48)}{72+48}$$

$$= \frac{6912}{120} = 57.6 \text{ km/h}$$

Final Answer

57.6 km/h

RAPID REVISION GRID

Core

$$S = \frac{D}{T}, \quad D = ST, \quad T = \frac{D}{S}$$

Train distance

$$\text{Pole: } L \quad \text{Platform: } L + P$$

Boat/stream

$$B = \frac{D + U}{2}, \quad R = \frac{D - U}{2}$$

Quick unit pair

$$18 \text{ km/h} = 5 \text{ m/s}$$

$$36 \text{ km/h} = 10 \text{ m/s}$$

$$72 \text{ km/h} = 20 \text{ m/s}$$

Equal-distance round trip

$$\bar{S} = \frac{2xy}{x + y}$$

Relative speed

$$\text{Opposite: } x + y \quad \text{Same: } |x - y|$$