TIME & DISTANCE

✓ Speed, Time and Distance

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

$$\text{Distance} = \text{Speed} \times \text{Time}$$

✓ km/hr to m/sec conversion:

$$a \text{ km/hr} = a \times \frac{5}{18} \text{ m/sec}$$

✓ m/sec to km/hr conversion:

$$a \text{ m/sec} = a \times \frac{18}{5} \text{ km/hr}$$

- ✓ If the ratio of speeds of A and B is a : b, then the ratio of the time taken by them to cover the same distance will be $\frac{1}{a} : \frac{1}{b}$ or b : a

- ✓ Suppose a man covers a certain distance at x km/hr and an equal distance at y km/hr, then the average speed of whole journey $= \frac{2xy}{x+y}$ km/hr

Question

A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

A. 3.6

B. 7.2

C. 8.4

D. 10

Answer: Option **B**

Explanation:

Speed = $\frac{600}{5\ x\ 60}$ = 2 m/sec

Converting to km/hr:

$$2 \times \frac{18}{5} = 7.2 \text{ km/hr}$$

Question

If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:

A. 50 km

B. 56 km

C. 70 km

D. 80 km

Answer: Option A

Explanation:

Let the actual distance travelled is x km

Then, $\frac{x}{10} = \frac{x+20}{14}$

$14x = 10x + 200$

$x = 50$ km

Question

Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?

A. 9
B. 10
C. 12
D. 20

Answer: Option B

Explanation:

Due to stoppages, it covers 9 km less.

Time taken to cover 9 km = $\frac{9}{54}$ x 60 = 10 min

Question

A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:

A. 100 kmph

B. 110 kmph

C. 120 kmph

D. 130 kmph

Answer: Option C

Explanation:

Let the speed of car is x kmph.

Then, speed of train = $\frac{150}{100}$ x = $\frac{3}{2}$x kmph

$\frac{75}{x} - \frac{75}{\left(\frac{3}{2}\right)x} = \frac{125}{10\ x\ 60}$ or $\frac{75}{x} - \frac{50}{x} = \frac{5}{24}$

X = $\frac{25\ x\ 24}{5}$ = 120 kmph

Question

A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

A. 220 km
B. 224 km
C. 230 km
D. 234 km

Answer: Option **B**

Explanation:

$$\frac{(1/2)x}{21} + \frac{(1/2)x}{24} = 10$$

$$\Rightarrow \frac{x}{21} + \frac{x}{24} = 20$$

$$\Rightarrow 15x = 168 \text{ x } 20$$

$$\Rightarrow x = \left(\frac{168 \text{ x } 20}{15}\right) = 224 \text{ km.}$$

Question

A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is:

A. 35.55 km/hr
B. 36 km/hr
C. 71.11 km/hr
D. 71 km/hr

Answer: Option **C**

Explanation:

$$\text{Total time taken} = \left(\frac{160}{64} + \frac{160}{80}\right)\text{hrs.} = \frac{9}{2}\text{ hrs.}$$

$$\therefore \text{ Average speed} = \left(320 \times \frac{2}{9}\right)\text{km/hr} = 71.11\text{ km/hr.}$$

Question

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 is:

A. 5 kmph
B. 6 kmph
C. 6.25 kmph
D. 7.5 kmph

Answer: Option **A**

Explanation:

Let Abhay's speed be x km/hr.

Then, $\frac{30}{x} - \frac{30}{2x} = 3$

$\Rightarrow 6x = 30$

$\Rightarrow x = 5$ km/hr.

Question

A man covers a certain distance between his house and office by scooter. At an average speed of 30Km/hr, he is late by 10min. However at a speed of 40 km/hr, he reaches is office 5 min earlier. Find the distance between his house and office.

A. 30 km

B. 35 km

C. 40 km

D. 45 km

Answer : Option A

Question

A monkey tries to ascend a greased pole 14 meters high. He ascends 2 meters in first minute and slips down 1 meter in the alternate minute. If he continues to ascend in this fashion, how long does he take to reach the top?

A. 20 min
B. 22 min
C. 25 min
D. 30 min

Answer : Option C

Next Class: PROBLEM ON TRAINS