Time and Distance Questions for CDS, CLAT & SSC Exams.

Time and distance Quiz 3

Directions: Study the following Questions carefully and choose the right answer:

1. A thief is spotted by a policeman from a distance of 100 m. When the policeman starts the chase, the thief also starts running. If the speed of the thief be 8 km/hr and that of the policeman 10 km/hr. How far the thief will have run before he is overtaken?

A. 100 m B. 150 m C. 200 m D. 400 m

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

A. 5 min. B. 10 min. C. 13 min. D. 19 min.

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3. A motor-cycle covers 40 km with a speed of 20 km/hr. find the speed of the motor-cycle for the next 40 km journey so that the average speed of the whole journey will be 30 km/hr.

A. 70 km/hr B. 52.5 km/hr C. 60 km/hr D. 60.5 km/hr

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4. A man rides at the rate of 18 km/hr, but stops for 6 minutes to change horses at the end of every 7th 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.

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5. Walking at 3 km/hr . Pintu reaches his school 5 minutes late. If he walks at 4 km per hour he will be 5 minutes early. The distance of Pintu's from his house is

A. $1\frac{1}{2}$ km B. 2 km C. $2\frac{1}{2}$ km D. 5 km

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6. A car driver, driving in a fog, passes a pedestrian who was walking at the rate of 2 km/h in the same direction. The pedestrian could see the car for 6 min and it was visible to him up to a distance of 0.6 km. What was the speed of the car?

A. 15 km/hr B. 30 km/hr C. 20 km/hr D. 8 km/hr

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7. A thief is noticed by a police man from a distance of 200m. The thief starts running and the policeman chases him. The thief and the policeman run at the rate of 10 km and 11 km per hour respectively. The distance (in metres) between the, after 6 minutes is

A. 190 B. 200 C. 100 D. 150

8. Alok walks to a viewpoint and returns to the starting point by his car and thus takes a total time of 6 hrs 45 min. He would have gained 2 hrs by driving both ways. How long would it have taken for him to walk both ways?

A. 7 hrs 45 min B. 8 hrs 45 min C. 5 hrs 30 min D. None of these

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9. Walking 6/7 th of his usual speed a man gets late by 12 mins. The usual time taken by him to cover that distance is :

A. 1 hour B. 1 hour 12 minutes C. 1 hour 15 minutes D. 1 hour 20 minutes

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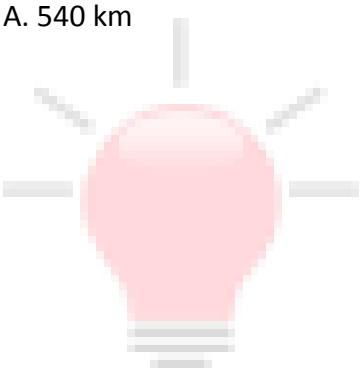
10. A car travels from P to Q at a constant speed. If its speed were increased by 10 km/hr, it would have been taken one hour lesser to cover the distance. It would have taken further 45 minutes lesser if the speed were further increased by 10 km/hr. The distance between the two cities is

A. 540 km B. 420 km C. 600 km D. 620 km



Correct Answers:

1	2	3	4	5	6	7	8	9	10
D	D	C	B	B	D	C	B	B	B

Explanations:

1. Relative speed of policeman = (10 – 8) km/hr = 2 km/hr.

$\text{Time} = \frac{\text{Distance}}{\text{Relative speed}}$

Time taken by policeman to cover 100 m

$= \left(\frac{100}{1000} \times \frac{1}{2}\right)$ hr $= \frac{1}{20}$ hr.

In $\frac{1}{20}$ hrs, the thief covers a distance of

$\left(8 \times \frac{1}{20}\right)$ km $= \frac{2}{5}$ km = 400m.

Hence, option D is correct.

2. Let the distance be x, then,
(Time taken to walk x km) + (Time taken to ride x km) = 37min.
⇒ (Time taken to walk 2x km) + (Time taken to ride 2x km) = 74 min.
But, time taken to walk 2x km = 55 min.
So, Time to ride 2x km = (74 – 55) min ⇒ 19 min.
Hence, option D is correct.

3. To solve this question, we can apply a short trick approach;
If a certain distance is covered at x km/hr and the same distance is covered at y km/hr then the average speed during the whole journey

$= \frac{2xy}{x + y}$ km/hr.

Given,
Average speed of whole journey = 30 km/hr
x = speed of first 40 km = 20 km/hr

$\Rightarrow 30 = \frac{2 \times 20 \times y}{20 + y}$

$\Rightarrow 600 + 30y = 40y \quad \Rightarrow 10y = 600$

$\Rightarrow y = \frac{600}{10} = 60$ km/hr.

Hence, option C is correct.

4. To solve this question, we can apply a short trick approach;

$\frac{\text{Distance to be covered}}{\text{Speed}}$ + No. of stoppages × Time for each rest

Given,

Number of stoppages

$= \frac{90}{7} = 12.8,$

it means there is 12 stoppages.
Distance to be covered = 90 km, Speed = 18,
Time for each stoppage = 6 mins.
By the short trick approach, we get

$= \left(\frac{90}{18}\right) + 12 \times 6$

= 5 hrs + 72 mins
Convert mins to hours then,
= 6 hrs 12 mins.

Hence, option B is correct.

5. To solve this question, we can apply a short trick approach;

$\frac{\text{Product of two speeds}}{\text{Difference of two speeds}}$ × Difference between arrival times

Given,
$Speed_1$ = 3 km/hr, $Speed_2$ = 4 km/hr
$Time_1$ = 5 mins late, $Time_2$ = 5 min early
Reqd. Distance

$= \frac{3 \times 4}{4 - 3} \times \frac{5 + 5}{60} = \frac{12}{1} \times \frac{10}{60} = 2$ km

Hence, option B is correct.

6. **Method 1:**

To solve this question, we can apply a short trick approach;

speed of the car = $(x + \frac{d}{t})$km/hr.

Given,

Where x ⇒ the speed of the man = 2 km/hr

Where t ⇒ the time duration = 6 min

$= \frac{6}{60} = \frac{1}{10}$hours.

Where d ⇒ the visible distance = 0.6 km

By the short trick approach, we get

$= \left(2 + \frac{0.6}{1/10}\right)$ km/hr

= 2 + (0.6 × 10) = 2 + 6 = 8 km/hr.

Method 2:

In 6 minutes, the car goes ahead by 0.6 km.

Hence, the relative speed of the car with respect to the pedestrian = 6 kmph

= Speed of car – Speed of pedestrian

We know that if two objects move in same direction at different speeds and if speed of 1st object = x km/hr and speed of 2nd object = y km/hr, their relative speed = (x – y) km/hr [where x > y],

6 = Speed or car - 2

Therefore, speed of car = 6 + 2 = 8 kmph

Hence, option D is correct.

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7. Relative speed of the thief and policeman = (11 – 10) km/hr = 1 km/hr

Distance covered in 6 minutes = Speed × Time

$= \left(\frac{1}{60 \text{ min}} \times 6 \text{ min}\right)$ km $= \frac{1}{10}$ km = 100m.

Hence, option C is correct.

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8. To solve this question, we can apply a short trick approach

Both ways driving = One way walking and one way driving time + gain in time

Given,

Walking time + driving time = 6 hours 45 min

2 sides driving = 6 hrs 45 min + 2 hrs = 8 hrs 45 min.

Hence, option B is correct.

9. Method I: To solve this question, we can apply a short trick approach

Required time = $\left[\frac{\text{Change in time}}{\left(\frac{b}{a}-1\right)}\right]$ hrs.

Given,

Speed = $\frac{a}{b}=\frac{6}{7}$; so, $\frac{b}{a}=\frac{7}{6}$

Change in time = 12 minutes

By the short trick approach, we get

$= \left[\frac{12}{\left(\frac{7}{6}-1\right)}\right]$ hrs

$= \frac{12 \times 6}{7-6} = 72$ minutes

= 1 hour 12 minutes.

Method II:

New Speed = $\frac{6}{7}$ of the usual speed

∴ New time taken

$= \frac{7}{6}$ of the usual time

So, $\left(\frac{7}{6}\text{ of the usual time}\right)$ – (usual time) = 12 mins

$\Rightarrow \frac{1}{6}$ of the usual time = 12 min

⇒ Usual time = 72 mins = 1 hr 12 mins.

Hence, option B is correct.

10. Traditional Method :

Let distance = x km and usual rate = y kmph. Then,

$\frac{x}{y} - \frac{x}{y+10} = 1$ or $y(y + 10) = 10x$ ..... (i)

Now, in the 2nd scenario with a further increase in speed the driver could have saved another 45 min = 3/4 hr.
Therefore, total time saved

$= 1 + \frac{3}{4} = \frac{7}{4}$ hrs.

Putting it in eq, we get

$\frac{x}{y} - \frac{x}{y+20} = \frac{7}{4}$ or $y(y + 20) = \frac{80x}{7}$ .....(ii)

On dividing (i) by (ii), we get y = 60.
Substituting y = 60 in (i), we get : x = 420 km.

Smart Approach :

Product of Speeds

$\text{Product of speeds} = \frac{\text{Distance} \times \text{Diff. in Speeds}}{\text{Diff. in time}}$

Let initial speed be x km/hr and the distance between P and Q be D.
In the 1st scenario,
Initial speed = x, Increased speed = (x + 10), difference in speeds = 10 kmph and difference in time = 1 hr

$x(x + 10) = \frac{D \times 10}{1}$ **...(i)**

In the 2nd scenario,
Initial speed = x, Increased speed = (x + 20), difference in speeds = 20 kmph and difference in time = 1 hr + 45 min = $1 + \frac{3}{4} = \frac{7}{4}$ hrs.

$x(x + 20) = \frac{D \times 20 \times 4}{7}$ **...(ii)**

Dividing Eq. (ii) by Eq.(i) , we get

$\frac{(x + 20)}{(x + 10)} = \frac{20 \times 4}{7} \times \frac{1}{10}$

$= \frac{8}{7}$

$\Rightarrow$ 140 + 7x = 80 + 8x

$\therefore$ x = initial speed = 60 km/hr

Putting the value of x in eq. (i), we get

$60 \times 70 = D \times 10$

$\therefore$ D = 420 km.

Hence, option B is correct.