

## Examrace

## Aptitude Logical Reasoning Time and Distance 2021 Competitive Exams Part 7

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1. The ratio between the speeds of two trains is 7: 8. If the second train runs 400km in 5 hours. The speed of the first train is:

- A. 70km/hr
- B. 200km/hr
- C. 250km/hr
- D. 350km/hr

Ans: A

2. If a student walks from his house to school at 5km/hr he is late by 30 minutes. However, if he walks at 6km/hr he is late by 5 minutes only. The distance of his school from his house

- A. 2.5 km
- B. 3.6 km
- C. 5.5 km
- D. 12.5 km

Ans: D

Explanation:

Let the required distance be x km.

$$\text{Then } \frac{x}{5} - \frac{x}{6} = \frac{25}{60}$$

$$\Rightarrow 12x - 10x = 25$$

$$\Rightarrow 2x = 25$$

$$\Rightarrow x = 12.5 \text{ km}$$

3. A plane left 30 minutes later than the scheduled time and in order to reach the destination 1500km away it had to increase the speed by 250km/hr from the usual speed is

- A. 720km/hr
- B. 730km/hr
- C. 740km/hr
- D. 750km/hr

Ans: D

Explanation:

Let the usual be x km/hr

$$\frac{1500}{x} - \frac{1500}{x + 250} = \frac{1}{2}$$

$$= \frac{1}{x} - \frac{1}{x + 250} = \frac{1}{3000}$$

$$= -\frac{(x + 250) - x}{x(x + 250)} = \frac{1}{3000}$$

$$\Rightarrow x(x + 250) = 750000$$

$$\Rightarrow x^2 + 250x - 750x - 750000 = 0$$

$$\Rightarrow x(x + 1000) - 750(x + 1000) = 0$$

$$\Rightarrow (x + 1000)(x - 750) = 0$$

$$\Rightarrow x = 750.$$

4. Walking with  $\frac{3}{4}$  of his usual speed a man covers a certain distance in 2 hours more than the time he took to cover the distance with usual speed is

A.  $4\frac{1}{2}$  Hours

B.  $5\frac{1}{2}$  hours

C. 5 Hours

D. 6 Hours

Ans: D

Explanation:

Let the distance be x km and usual speed be y km/hr

Then

$$\frac{x}{\left(\frac{3}{4}y\right)} - \frac{x}{y} = 2$$

$$\Rightarrow \frac{x}{y} \left[ \frac{4}{3} - 1 \right] = 2$$

$$\Rightarrow \frac{x}{y} \cdot \frac{1}{3} = 2$$

$$\Rightarrow \frac{x}{y} = 6$$

5. A certain distance covered at a certain speed. If half of this distance is covered in double the time the ratio of the two speeds is

A. 4 : 1

B. 1 : 4

C. 2 : 1

D. 1 : 2

Ans: A

Explanation:

Let x kms be covered in y hours, then first speed =  $\frac{x}{y}$  km/hr

Again  $\frac{x}{2}$  km is covered in 2y hrs

Therefore, new speed =  $\left(\frac{x}{2} \frac{1}{2y}\right)$  km/hr

$$= \left(\frac{x}{4y}\right) \text{ km/hr}$$

$$\text{Ratio of speeds} = \frac{x}{y} : \frac{x}{4y} = 1 : \frac{1}{4}$$

$$= 4 : 1$$

6. Two cars start at the same time from one point and move along two roads at right angles to each other. Their speeds are 36km/hr and 48km/hr respectively after 15seconds the distance between them will be

A. 150m

B. 250m

C. 300m

D. 400m

Ans: B

Explanation:

$$\frac{36 \text{ km}}{\text{hr}} = \left(36 \times \frac{5}{18}\right) \text{ m/sec} = 10 \text{ m/sec}$$

$$\text{Distance covered in 15sec} = OA = (10 \times 15) \text{ m} = 150 \text{ m} \quad 48 \text{ km/hr} = \left(48 \times \frac{5}{18}\right) \text{ m/sec} = \frac{40}{3} \text{ m/sec}$$

$$\text{Distance covered in 15 sec} = OB = \left(\frac{40}{3} \times 15\right) \text{ m} = 200 \text{ m}$$

Distance between A and B

$$AB = \sqrt{(150)^2 + (200)^2} = \sqrt{62500} \text{ m} = 250 \text{ m}$$

7. A train covered a certain distance at a uniform speed. IF the train had been 6km/hr faster, it would have taken 4 hours less. Then the scheduled time and if the train were slower by 6km/hr. The train would have taken 6 hours more than the scheduled time. The length of Journey is

- A. 700km
- B. 720km
- C. 740km
- D. 760km

Ans: B

Explanation:

Let the distance be x km and uniform speed by y

$$\frac{x}{y} - \frac{x}{y+6} = 4 \dots (i)$$

$$\frac{x}{y-6} - \frac{x}{y} = 6 \dots (ii)$$

$$\Rightarrow xy + 6x - xy = 4y(y+6) \text{ and } xy - xy + 6x = 6y(y-6)$$

$$\Rightarrow 4y^2 + 24y - 6x = 0 \text{ and } 6y^2 - 36y - 6x = 0$$

$$\Rightarrow 2y^2 - 60y = 0$$

$$\Rightarrow 2y(y-30) = 0$$

$$\Rightarrow Y = 30 \frac{x}{30} - \frac{x}{36} = 4$$

$$\Rightarrow 6x - 5x = 720$$

$$\Rightarrow X = 720 \text{ km}$$

8. Bombay express left Delhi for Bombay at 14.30 hours. Travelling at a speed of 60kmph and Rajdhani express left Delhi for Bombay on the same day at 16.30 hours travelling speed of 80kmph. How far away from Delhi will the two trains meet?

- A. 120km
- B. 360km
- C. 480km
- D. 500km

Ans: C

Explanation:

Let the train meet at a distance of x km from Delhi.

$$\text{Then } \frac{x}{60} - \frac{x}{80} = 2$$

$$\Rightarrow 4x - 3x$$

$$\Rightarrow x = 480$$

Therefore, Required distance = 480 km

9. A and B start simultaneously from a certain point in north and south direction motor cycles. The Speed of A is 80 km/hr and that of B is 65km/hr. What is the distance between A and B after 12 minutes?

- A. 14.5km
- B. 29km
- C. 36.2km

D. 39km

Ans: B

Explanation:

Required distance = sum of distance covered by A and B

$$= \left[ \left( 80 \times \frac{12}{60} \right) + \left( 65 \times \frac{12}{60} \right) \right] \text{ km}$$

$$= (16 + 13) \text{ km} = 29 \text{ km}$$

10. R and S start walking towards each other at 10 am at speeds of 3km/hr and 4km/hr respectively. They were initially 17.5km apart at what time do they meet?

A. 11.30am

B. 12: 30pm

C. 1: 30pm

D. 2: 30pm

Ans: B

Explanation:

Suppose they meet x hours, then  $3x + 4x = 17.5$

$$= 7x = 17.5$$

$$= x = 2.5 \text{ hours}$$

$$x = 2.5 \text{ hours}$$

So they meet at 12: 30 p. m.

11. A boy is running at a speed of P km/hr to cover a distance of 1km but due to the slippery ground, his speed is reduced by Q km/hr ( $P > Q$ ). If he takes R hours to cover the distance then,

A.  $\frac{1}{R} = (P - Q)$

B.  $R = (P - Q)$

C.  $\frac{1}{R} = (P + Q)$

D.  $R = (P + Q)$

Ans: A

Explanation:

Actual speed =  $(P - Q) \frac{\text{km}}{\text{hr}}$ , time taken = R hrs

$$\text{Distance} = (\text{Speed} \times \text{time})$$

$$\text{Therefore, } 1 = (P - Q) R \Rightarrow \frac{1}{R} = (P - Q)$$

12. A star is  $8.1 \times 10^{13}$  km away from the earth. Suppose light travels at the speed of  $3.0 \times 10^5$  km per second. How long will it take light from the star to reach the earth?

A.  $7.5 \times 10^3$  hrs

B.  $7.5 \times 10^4$  hrs

C.  $2.7 \times 10^{10}$  sec

D.  $2.7 \times 10^{11}$  sec

Ans: B

Explanation:

$(3 \times 10^5)$  km is covered in 1sec

$(8.1 \times 10^{13})$  km covered in

$$\begin{aligned}
&= \left( \frac{1}{3 \times 10^5} \times 8.1 \times 10^{13} \right) \\
&= \left( \frac{2.7 \times 10^{16}}{36} \right) \text{ hrs} \\
&= \left( 2.7 \times 108 \times \frac{1}{60} \times \frac{1}{60} \right) \text{ hrs} \\
&= \left( \frac{2.7 \times 100 \times 104}{36} \right) \text{ hrs} \\
&= (7.5 \times 104) \text{ hrs}
\end{aligned}$$

13. The speeds of the three cars are in the ratio 2 : 3 : 4 . The ratio of the time taken by these cars to travel the same distance is

- A. 2 : 3 : 4
- B. 4 : 3 : 2
- C. 4 : 3 : 6
- D. 6 : 4 : 3

Ans: D

Explanation:

$$\begin{aligned}
\text{Ratio of time taken} &= \frac{1}{2} : \frac{1}{3} : \frac{1}{4} \\
&= 6 : 4 : 3
\end{aligned}$$

14. Sunil covers a distance by walking for 6 hours while returning his speed decreases by 1km/hr and he takes 9 hours to covers the same distance what was his speed in turns journey?

- A. 2km/hr
- B. 3km/hr
- C. 5km/hr
- D. cannot be determined

Ans: A

Explanation:

Let the speed in return journey be x km/hr, then

$$\begin{aligned}
6(x + 1) &= 9x \\
\Rightarrow 3x &= 6 \\
\Rightarrow x &= 2
\end{aligned}$$

Hence the speed in return journey is 2km/hr

15. A takes 2 hours more than B to walk D km. If A doubles his speed then he can make it in 1 hour less than B. How much time does B require for walking D km?

- A. D/2 km
- B. 3hrs
- C. 4hrs
- D. 2D/3hrs

Ans: C

Explanation:

Suppose B takes x hours to walk d km

Then A takes (x + 2) hours to walk d km

With double of the speed.

$$\text{A will take } \frac{1}{2}(x + 2) \text{ hours}$$

$$\text{Therefore, } x - 1/2(x + 2) = 1$$

$$2x - (x + 2)$$

$$X = 4$$

Hence B takes 4 hours to walk d km

16. A walks at a uniform rate of 4km an hour and 4 hours after his start, B cycles after his at the uniform rate of 10km an hour. How far from than starting point will B catch A?

- A. 16.7 km
- B. 18.6 km
- C. 21.5 km
- D. 26.7 km

Ans: D

Explanation:

Suppose B catches A after x hours then,

Distance between travel by A in (x + 4) hours = Distance travelled by B in x hours

$$\Rightarrow 4(x + 4) = 10x$$

$$\Rightarrow 6x = 16$$

$$\Rightarrow 3x = 8$$

$$\Rightarrow X = \frac{8}{3} \text{ hrs}$$

Distance travelled by B in  $\frac{8}{3}$  hrs

$$= \left( \frac{8}{3} \times 10 \right) \text{ km} = \frac{80}{3} \text{ km} = 26.7 \text{ km}$$

17. Two trains start from stations. A and B and travel toward each other at 50km/hr and 60km/hr respectively at the time of their meeting, the second train has travelled 120km more than the first train. The distance between A and B is?

- A. 990km
- B. 1200km
- C. 1320km
- D. 1440km

Ans: C

Explanation:

Let the trains meet after x hours, then  $60x - 50x = 120$

$$\Rightarrow 10x = 120$$

$$\Rightarrow x = 12 \text{ hrs}$$

Distance AB = (Distance covered by slow train) + (Distance covered by fast train)

$$= [(50 \times 12) + (60 \times 12)] \text{ km}$$

$$= (600 + 720) \text{ km}$$

$$= 1320 \text{ km}$$

18. A fast train takes 3 hours less than the slow train for a journey of 600km. IF the speed of the slow train is 10km/hr less than the fast train the speed of the slow train is

- A. 30km/hr
- B. 35km/hr
- C. 40km/hr
- D. 45km/hr

Ans: C

Explanation:

Let the speed of the train be  $x$  km/hr and  $(x + 10)$  km/hr, then

$$\begin{aligned} &= \frac{600}{x} - \frac{600}{x+10} = 3 \\ &= \frac{1}{x} - \frac{1}{x+10} = \frac{1}{200} \\ &= \frac{(x+10) - x}{x(x+10)} = \frac{1}{200} \\ &= x^2 + 10x - 2000 = 0 \\ &= (x+50)(x-40) = 0 \\ &= x = 40 \end{aligned}$$

Speed of a slow train = 40 km/hr

19. A constable is 114m behind a thief. The constable runs 21m and the thief 15m in a minute. In what time will the constable catch the thief?

- A. 16 min
- B. 17min
- C. 18min
- D. 19 min

Ans: D

Explanation:

$$(21 - 15) \text{ m i.e. is covered in 1 min } 114\text{m will be covered in } \left(\frac{1}{6} \times 114\right) \text{ min} = 19\text{min}$$

20. An express train travelled at an average speed of 100km/hr stopping for 3 minutes after 75km. A local after travelled at a speed of 50 km/hr, stopping for 1 minute after every 25km. If the trains began travelling at the same time how many km and did the local train travel in the time it took the express train to travel 60 km?

- A. 307.5 km
- B. 900km
- C. 1000km
- D. 1200km

Ans: A

Explanation:

$$\text{Time taken by express train to cover 75km plus stoppage} = \left(\frac{60}{100} \times 75\right) \text{ min} + 3 \text{ min} = 48 \text{ min}$$

Time taken by express train to cover 600km

$$\text{Time taken by it to cover 525km} + \text{Time taken by into cover 75km} = \left(\frac{48}{75} \times 525\right) \text{ min} + \left(\frac{60}{100} \times 75\right) \text{ min} = (336 + 45) \text{ min}$$

$$\text{Time taken by local train to cover 25km plus stoppage} = \left(\frac{60}{50} \times 25\right) \text{ min} + 1 \text{ min} = 31 \text{ min}$$

In 31 min distance covered by = 25km

$$\text{In } (31 \times 12) \text{ min distance covered} = \left(\frac{25}{31} \times 31 \times 12\right) \text{ km} = 300\text{km}$$

$$\text{In last 9 min distance covered} = \left(\frac{25}{30} \times 9\right) \text{ km} = 7.5 \text{ km}$$

Total distance covered = 307.5 km