TIME, SPEED AND DISTANCE-1_CSAT_ANSWER_EXPLANATION

Answer 1: (D)

Average speed = $\frac{2S_1 \times S_2}{S_1 + S_2}$ [where S_1 and S_2 are speeds.]

= $\frac{2 \times 100 \times 150}{(100 + 150)}$ = $\frac{2 \times 100 \times 150}{250}$ = 120 kmph

Answer 2: (C)

Speed $\propto \frac{1}{\text{Time}}$

∴ Required ratio of time

= $1 : \frac{1}{3} : \frac{1}{5}$ = 15 : 5 : 3

Answer 3: (B)

Time taken in covering 5 Km = 5/10 = 1/2 hr

= 30 minutes

That person will take rest for four times.

∴ Required time = (30 + 4 × 5) minutes = 50 minutes

Answer 4: (B)

New speed of car = $\frac{200}{5} \times 2$ = 80 km/h

Now, $\frac{4}{5}\times$ Usual speed = 80

∴ Usual speed = 100 km/h

Answer 5: (A)

Let the required distance be x km.

Difference of time = 15 + 5 = 20 minutes = $\frac{1}{3}$ hour

According to the question,

$\frac{x}{35} - \frac{x}{42} = \frac{1}{3}$

$\Rightarrow \frac{6x - 5x}{210} = \frac{1}{3}$

$\Rightarrow \frac{x}{210} = \frac{1}{3}$

∴ x = 70 km

Answer 6: (D)

Let time taken while walking be x hours and time taken on riding be y hours.

According to question,

$x + y = 12\frac{1}{2}$ hours ..... (i)

Again, 2y = 4 hours

y = 2 hours

From equation (i), we get:

$x = 12\frac{1}{2} - 2 = 10\frac{1}{2}$ hrs

∴ Time required to walk both ways = 21 hours

Answer 7: (B)

Here, S_1 = 6, t_1 = 12

S_2 = 8, t_2 = 12

Distance = $\frac{(S_1 \times S_2)(t_1 + t_2)}{S_2 - S_1}$

= $\frac{(6\times8)(12+12)}{8-6} \times \frac{1}{60} = \frac{48\times24}{2\times60}$ = 9.6 km

Answer 8: (C)

Here, S_1 = 20, t_1 = 9

S_2 = 30, t_2 = 6

∴ Distance = $\frac{(S_1 \times S_2)(t_1 + t_2)}{S_2 - S_1}$

= $\frac{(20\times30)(9+6)}{(30-20)\times60} = \frac{600\times15}{10\times60}$ = 15 km

Answer 9: (D)

Given: 3 hours 36 minutes = 216 minutes

Ratio of the speed of A and B = A : B = 2 : 1 = 6 : 3

B : C = 3 : 1

∴ A : B : C = 6 : 3 : 1

∴ Ratio of their time taken = $\frac{1}{6} : \frac{1}{3} : 1 = 1 : 2 : 6$

∴ Time taken by B = $\frac{2}{6} \times 216 = 72$ minutes

Answer 10: (D)

Time	80	:	60
	4	:	3
Speed	3	:	4

Required speed = $\frac{75}{3} \times 4$ = 100 kmph

Answer 11: (B)

Here, $S_1 = 9$, $t_1 = x$

$S_2 = 10$, $t_2 = x - \frac{36}{60}$

$S_1t_1 = S_2t_2$

$9 \times x = 10\left(x - \frac{36}{60}\right)$

$\Rightarrow 9x = 10x - 6$

$x = 6$

$\therefore$ Distance travelled = 9 × 6 = 54 km

Answer 12: (B)

Total distance = 12 × 4 = 48 km

Total time = $\left(\frac{12}{10} + \frac{12}{20} + \frac{12}{30} + \frac{12}{40}\right)$ hrs = $\frac{5}{2}$ hrs

$\therefore$ Average speed = Total distance ÷ Total time

= $\frac{48}{\frac{5}{2}}$ = 19.2 km/h

Answer 13: (C)

Let speed of car be x km/h.

According to the question,

$600 = 30 \times \frac{x}{4}$

$\therefore x = 80$ kmph

Answer 14: (C)

Speed of person = 9 km/h = $\frac{5}{2}$ m/sec

$\therefore$ Length of the diagonal of square field

= $\frac{5}{2}$ × 60 = 150 m

$\therefore$ Required area = $\frac{1}{2} \times 150 \times 150$ = 11250 sq. m

Answer 15: (C)

If the required distance be x km, then:

$x = \frac{15 \times 12}{15 - 12} \times 2$

$\therefore x = 120$ km

Answer 16: (C)

Here, $\frac{A}{B} = \frac{3}{4}$, time= 2 hours

$\therefore$ Usual time = $\frac{A}{|A - B|} \times |T_1 - T_2|$

= $\frac{3}{4-3} \times 2$ = 6 hours

Answer 17: (A)

Speed with stoppages = 75 km/h

Speed without stoppages = 90 km/h

Difference in speed = 90 – 75 = 15 km/h

Required time = $\frac{\text{Difference in speed}}{\text{Speed without stoppages}} \times 60$

= $\frac{15}{90} \times 60$ = 10 minutes

Answer 18: (A)

Let the speed be a km/h.

Required distance = $\frac{a \times (a+6)}{6} \times \frac{5}{9} = \frac{a \times (a-8)}{8} \times 1$

$\Rightarrow 20a + 120 = 27a - 216$

$\Rightarrow 7a = 336$

$\Rightarrow a = 48$ km/h

$\therefore$ Distance = $\frac{48 \times (48+6)}{6} \times \frac{5}{9} = 240$ km

Answer 19: (C)

Speed = 8 km/h

Distance = 24 km

Time taken by a man to reach at pole y = 24/8 = 3 hours

Speed of parrot = 75 km/hr

$\therefore$ Distance travelled by parrot = 75 × 3 = 225 km

Answer 20: (D)

Let a = 200 and b = 100

Then, x = (40% × a + 70% × b) = 80 + 70 = 150

And y = (50% × a + 50% × b) = 100 + 50 = 150

Here, x = y

Again, let a = 110 and b = 100

Then, x = (40% × a + 70% × b) = 44 + 70 = 114

And y = (50% × a + 50% × b) = 55 + 50 = 105

Here, x > y

Again, let a = 300 and b = 100

Then, x = (40% × a + 70% × b) = 120 + 70 = 190

And y = (50% × a + 50% × b) = 150 + 50 = 200

Here, x < y

Hence, the relation between x and y can't be established.