SPECIAL PRACTICE SET SOLUTION BY ALOK SIR

1. **(a) Let the total distance travelled by $2x$ km.**

Distance travelled by car = x km

Distance travelled by bus = x km

Speed of car = 42 km/h

Speed of bus = 28 km/h

According to question

$$\frac{x}{42} + \frac{x}{28} = 2h\ 5\ \text{min}$$

$$\frac{5x}{84} = \frac{25}{12} = 35$$

Distance = 70

2. **(c)**

3. **(b)** $\textbf{Speed of car} = \dfrac{\text{Distance covered}}{\text{Time taken}}$

$$= \frac{720}{9} = 80 \text{ km/h}$$

$$\textbf{Now, speed of bus} = \frac{3}{4} \times 80 = 60 \text{ km/h}$$

$$\textbf{Speed of train} = \frac{27}{15} \times 60 = 108 \text{ km/h}$$

Distance covered by train in 7 h

$$= 108 \times 7 = 756 \text{ km}$$

4. **(a)**

5. **(b) Distance covered by bike**

$$= 64 \times 8 = 512 \text{ km}$$

$\therefore$ **Required speed**

$$= \frac{\text{Distance}}{\text{Time}} = \frac{512}{6}$$

$= 85.33 \text{ km} \approx 85 \text{ km/h}$

6. (a)

7. (b) Time taken in walking one way + Riding other way

$= 6 \text{ h } 35 \text{ min}$

Time taken in riding both ways

$= 4 \text{ h } 35 \text{ min}$

On multiplying Eq. (ii), we get

2 × Time taken in walking one way

$= 13h\,10 \text{ min} - 4 \text{ h } 35 \text{ min}$

$= 8 \text{ h } 35 \text{ min}$

8. (d)

9. (c) Let the speeds of a car, a train and a bus be $5x$, $9x$ and $4x$, respectively.

According to the question

$$\frac{5x + 9x + 4x}{3} = 72$$

$$\therefore\ 5x + 9x + 4x = 72 \times 3$$

$$18x = 216$$

$$x = 12$$

Average $$\frac{5x + 9x}{2} = 84$$

10. **(b)**

11. $$= \frac{476}{14} = 34$$

Length of platform = Speed × time

$$34 \times 20 = 680 \text{ m}$$

Time taken to cross the platform

$$= 7 \text{ min } 5\text{s}$$

$$= 7 \times 60 + 5$$

$$= 425 \text{ s}$$

$\therefore$ **Speed of man** $= \dfrac{\text{Length of Platform}}{\text{Time taken}}$

$= \dfrac{680}{425} = 1.6 \text{ m/s}$

12. (c)

13. (b) Speed of train = 108 km

$= 108 \times \dfrac{5}{18}$

$= 30 \text{ m/s}$

$\dfrac{x + 280}{12} = 30$

$x = 80$

Man speed $= \dfrac{80}{10} = 8$

14. (a)

15. (c) Let the speed of the stream be y km/h.

Then, boat's downstream speed

$$= 14 + y \text{ km/h}$$

Boat's upstream speed $= 14 - y$ **km/h**

According to the question,

Difference between the time = Time taken by boat to travel upstream – Time taken by boat to travel downstream

$$\frac{28}{14-y} - \frac{28}{14+y} = \frac{35}{60}$$

$$28\frac{(14+y-14+y)}{(14)^2-(y)^2} = \frac{35}{60}$$

$$\frac{56y}{196-y^2} = \frac{35}{60}$$

$$96y = 196 - y^2$$

$$y^2 + 96y - 196 = 0$$

$$y^2 + 98y - 2y - 196 = 0$$

$$y\,(y+98) - 2(y + 98) = 0$$

$$(y - 2)\,(y + 98) = 0$$

$$\therefore \quad y = 2 \text{ or } -98$$

Hence, speed of the stream is 2 km/h.

16. (a)

17. (b) Let the speed of the boat in still water be x km/h.

Given, speed of the stream = 4 km/h

Now, speed of the boat in upstream

$$= (x + 4) \text{ km/h}$$

and speed of the boat in downstream

$$= (x + 4) \text{ km/h}$$

$\therefore$ **Time taken to cover 6 km at**

$(x-4)$ km/h in upstream $= \frac{6}{(x-4)}$ h..... (i)

Time taken to cover 6 km at $(x+4)$

km/h in downstream $= \frac{6}{(x+4)}$ h ..... (ii)

$$\frac{6}{x+4}+\frac{6}{x-4}=2$$

$$x^2-6x-16=0$$

$$(x+2)(x-8)=0$$

$$x=8 \text{ km/h}$$

18. (c)

19. (b) By Short Trick 6.4

Let the length of train B = x m

$\therefore$ Length of train $A = \frac{3x}{4}$ m

Speed of train $A = \frac{4}{33}$ m/s

Speed of train $B = \frac{x}{55}$ m/s

$\therefore$ **Required ratio** $= \frac{3x}{4 \times 33} : \frac{x}{55} = 5 : 4$

20. (c)