53.3; Let first train also starts at 3: 20pm and add 40 km. to the total distance
Total distance = 490 km.
Total speed = 140 km./hr.

$$\text{Total time} = \frac{D}{S} = \frac{490}{140} = 3.5 \text{ hr.}$$

$\therefore$ They will meet at 3 : 20 p.m. + 3.5 hr.
= 6 : 50 p.m.

54.1; The first train will be far from second train $25 \times 5 = 125$ km.
and second train gains

$$\underbrace{(35-25)}_{\text{Relative speed}} = 10 \text{ km. per hour.}$$

$\therefore$ Time $= \frac{125}{10} = 12.5$ hours.
The required distance from Delhi

$$= 12.5 \times 35 = 437\frac{1}{2} \text{ km.}$$

55.1; The distance travelled by the man in 4 minutes = S × T

$$= 3 \times \frac{5}{18} \times 4 \times 60 = 200 \text{ m.}$$

(3 is multiplied by $\frac{5}{18}$ to change it into m./sec. and 4 multiplied by 60 to change it into seconds)
$\therefore$ distance travelled by the carriage in 4 minutes = (200 + 100) = 300 metres.

$\therefore$ Speed of carriage $= \frac{D}{T} = \frac{300 \text{ m.}}{4 \text{ min.}}$

$$= \frac{\frac{300}{1000}}{\frac{4}{60}} \text{ km./hr.} = 4\frac{1}{2} \text{ km her hour}$$

55.1; **Paramount concept** :-
100 m. = 4 min.

$$\therefore \text{ Speed} = \frac{\frac{300}{1000}}{\frac{4}{60}} \text{ km./hr} = 1.5 \text{ km/hr.}$$

So, speed of carriage = 1.5 km./hr. + speed of man = 4.5 km./hr.

56.1; **Short cut :-**
They will meet at

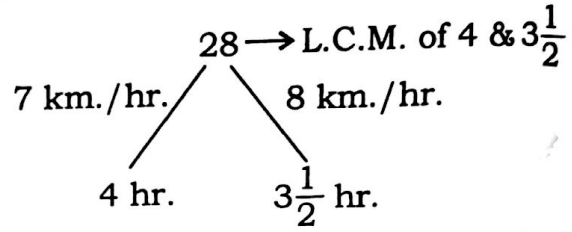
$$= 5 \text{ a.m.} + \frac{(9.00-5.00)(10.00-5.00)}{(9.00-5.00)+(10.00-6.30)}$$

$$= 5 \text{ am.} + \frac{(4)(5)}{(4)+(3.30)} \Rightarrow \frac{20}{7.30}$$

$$= 5 \text{ am.} + \frac{20}{7\frac{1}{2} \text{ hrs.}} \Rightarrow \frac{20 \times 2}{15} \Rightarrow \frac{40}{15} = 2.67$$

= 5am + 2.67
= 7 : 67am
= 7:67 ≈ 7: 40 am

56.1; **Paramount concept** :-



Distance travelled by train A till 6 : 30 a.m.

i.e. in $1\frac{1}{2}$ hrs. at 7 km./hr.

$= 10\frac{1}{2}$ km.

Distance left = $28 - 10\frac{1}{2} = 17\frac{1}{2}$ km.
Total speed = 7 + 8 = 15 km./hr.

$$\text{Time} = \frac{17\frac{1}{2}}{15} = 1 \text{ hr. , 10 min.}$$

$\therefore$ They will meet at 6.30 + 1 hr. 10 min.
= 7 : 40 am.

57.4;Pick up the option
Distance given = 36 km.
If speed = 36 km./hr.
Time = 1 hr.
If speed is increased by 4 km./hr.
then speed = 40 km./hr.

Time = $\frac{D}{S} = \frac{36}{40} \times 60 = 54$ min.

$\therefore$ time saved = 6 min.

58.4; Speed of train A = $\frac{150}{15}$ = 10m./sec.

Total length of both trains = 300 m.
Total = 12 sec.

$\therefore$ Total speed = $\frac{300}{12}$

= 25 m./sec.

$\therefore$ Speed of B = Total speed - Speed of A

= 25 - 10

= 15 m./sec.

or $15 \times \frac{18}{5}$ = 54 km/hr.

58.4; **Other method:-**

Speed of train = $\frac{150}{15}$ m./sec

= 10m/sec.

Now, Let x be the speed of second train

So, $(10 + x)$m./sec. = $\frac{(150+150)m.}{12 \text{ sec.}}$

or, $(10 + x)$ m./sec. = 25m./sec.

$\Rightarrow x = 15$ m/sec.

$= 15 \times \frac{18}{5}$ km./hr. = 54 km./hr.

59. 1; Difference in speed = 5 km./hr.
Difference in distance covered = 80 km.
Time taken to cover 80 km. more

= $\frac{D}{S} = \frac{80}{5}$ = 16 hr.

Distance between two stations
= (16 × 20)+ (16 ×25)
= 320 + 400 = 720 km.

59.1; **Other method:-**

Required distance

= $\frac{80 \text{ km}}{(25-20)\text{km./hr.}} \times (25 + 20)$ km./hr.

= 16 × 45 km. = 720 km.

60.3; Speed = 45 km./hr.
Distance travelled in 4 hr. = 180 km. or 180000 m.
Gap between two poles = 50m.

$\therefore$ Number of poles = $\frac{18000}{50} + 1$

= 3601 poles

(1 pole will be at the starting point)

60.3; **Other method:-**

No. of poles = $\frac{(45 \times 1000) \times 4}{50} + 1$

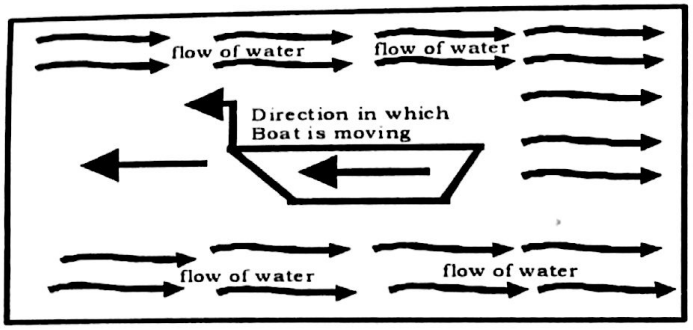
= 3600 + 1
= 3601 poles

5 BOATS AND STREAM

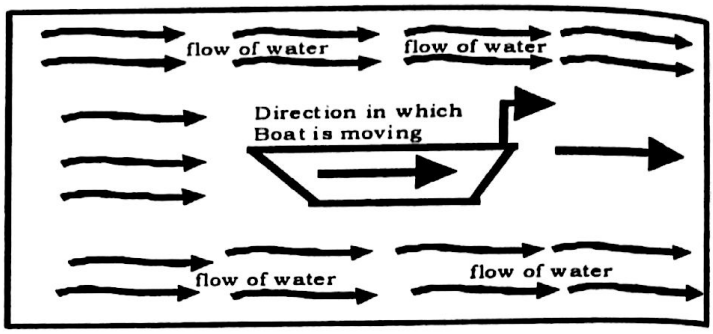
CHAPTER

IMPORTANT FORMULAE

Upstream



Downstream



Where,

S_b = Speed of boat in still water

S_c = Velocity of the stream

y = Speed Upstream

x = Speed Downstream

Important formulae:-

(i) $S_b = \frac{1}{2}(x+y)$ (ii) $S_c = \frac{1}{2}(x-y)$ (iii) $x = S_b + S_c$ (iv) $y = S_b - S_c$

1. A boat rowed down a river at 21 km/hr. and rowed up the river at 9 km/hr. What is the velocity of the stream?
   (1) 4 km/hr (2) 5 km/hr
   (3) 6 km/hr (4) 6.5 km/hr
   (5) None of these
2. A swimmer can swim downstream at 14 km/hr and upstream at 6 km/hr. What is the speed of the swimmer in still water?
   (1) 10 km/hr (2) 9.5 km/hr
   (3) 11 km/hr (4) 12 km/hr
   (5) None of these
3. The speed of a boat in still water is 4 km/hr while its speed against the stream is 2 km/hr. What is the velocity of the stream?
   (1) 3 km/hr (2) 3.5 km/hr
   (3) 2.5 km/hr (4) 1 km/hr
   (5) None of these
4. The speed of a boatman in the direction of stream is 15 km/hr while the velocity of the stream is 1.5 km/hr. What is the velocity of the boatman against the stream?
   (1) 11 km/hr (2) 12 km/hr
   (3) 16.30 km/hr (4) 14.75 km/hr
   (5) None of these
5. If the speed of a boat in still water is 7 km/hr and its speed against the stream is 2.5 km/hr, then what is its speed in the direction of the current?
   (1) 14.5 km/hr (2) 13 km/hr
   (3) 14 km/hr (4) 11.5 km/hr
   (5) None of these

6. The speed of a boat in still water is 9 km/hr and the speed of the stream is 2.5 km/hr. How much time will the boat take to go 9.1 km against the stream?
(1) 1 hr.20 min. (2) 1 hr.24 min.
(3) 1 hr.30 min. (4) 2 hrs.24 min.
(5) None of these

7. A swimmer swims a distance of 36 km in 6 hours downstream and a distance of 40 km upstream in 8 hours. What is his speed in still water?
(1) 5.5 km/hr (2) 6 km/hr
(3) 7 km/hr (4) 11km/hr
(5) None of these

8. A man rows a distance of 16 km upstream in 4 hour while a distance of 36 km downstream in 6 hours. What is the velocity of the stream?
(1) 7.5 km/hr (2) 2.5 km/hr
(3) 1.5 km/hr (4) 3.5 km/hr
(5) None of these

9. If a boat takes 4 hours to cover a distance of 8 km upstream while the speed of the stream is 1.5 km/hr. What is the speed of the boat in still water?
(1) 4 km/hr (2) 6.5 km/hr
(3) 3.5 km/hr (4) 2.5 km/hr
(5) None of these

10. A boat travels upstream from Q to P and downstream from P to Q in 3 hours. If the distance between P to Q is 4 km and the speed of the stream is 1 km/hr, then what is the speed of the boat in still water?
(1) 4.5 km/hr (2) 5.2 km/hr
(3) 2.5 km/hr (4) 3 km/hr
(5) None of these

11. The speed of the stream is 5 km/hr. A Motorboat goes 10 km upstream and back again to the starting point in 50 minutes. What is the speed of the motorboat in still water?
(1) 20 km/hr (2) 25 km/hr
(3) 28 km/hr (4) 30 km/hr
(5) None of these

12. A boat travels upstream from P to Q and downstream from Q to P in 3 hours. If the speed of the boat in still water is 9 km/hr and the velocity of the stream is 3 km/hr, then what is the distance from P to Q?
(1) 14 km (2) 8 km
(3) 12 km (4) 6 km
(5) None of these

13. A man can row 5 km/hr in still water and the velocity of the stream is 1.5 km/hr. He takes an hour when he travels upstream to a place and back again to the starting point. How far is the place from the starting point?
(1) 2.5 km (2) 6.5 km
(3) 3.5 km (4) 2.275 km
(5) None of these

14. A boat goes 11 km in an hour along the stream and 5 km an hour against the stream. The speed of the boat (in km./hr.) in still water is -
(1) 5 (2) 6
(3) 8 (4) 9
(5) None of these

15. A boat travels from P to Q along the stream and from Q to P against the stream in 3 hours. If the speed of the boat in still water is 4 km/hr, then what is the distance between P and Q?
(1) 8 km (2) 6 km
(3) 12 km
(4) Data insufficient
(5) None of these

16. In 3 hours Anshu can go 21 km along the stream and 15 km against the current in the same time. What is the velocity of the stream?
(1) 1 km./hr. (2) 2 km./hr.
(3) 2.5 km./hr. (4) 4 km./hr.
(5) None of these

17. A man can row $9\frac{1}{3}$ km/hr in still water and he finds that it takes him thrice as much time to row upstream as to row downstream (same distance). The speed of the current is-

(1) $3\frac{1}{3}$ km/hr (2) $3\frac{1}{9}$ km/hr

(3) $1\frac{1}{4}$ km/hr (4) $4\frac{2}{3}$ km/hr

(5) None of these

18. A boatman can row a certain distance down the stream in 2 hours and up the stream the same distance in 3 hours. If the stream flows at the rate of 4 km/hr, what is the speed of the boat in still water?

(1) 20 km/hr (2) 8 km/hr
(3) 16 km/hr (4) 15 km/hr
(5) None of these

19. A boat goes 6 km upstream and back again to the starting point in 2 hours. If the velocity of the stream is 4 km/hr, what is the speed of the boat in still water?

(1) 6.5 km/hr (2) 7.5 km/hr
(3) 8 km/hr (4) 8.5 km/hr
(5) None of these

20. A boat covers 12 km. upstream and 18 km downstream in 3 hours while it covers 36 km upstream and 24 km downstream in $6\frac{1}{2}$ hours, what is the velocity of the stream?

(1) 1.5 km/hr (2) 1 km/hr
(3) 2 km/hr (4) 2.5 km/hr
(5) None of these

Answers with explanations:

1;3 Speed of the boat along the stream (x) = 21 km./hr.
and speed of the boat against the stream (y) = 9 km./hr.

$\therefore$ velocity of the stream $(S_c) = \frac{1}{2}(x - y)$

$= \frac{1}{2} \times (21 - 9) = \frac{12}{2} = 6$ km./hr.

Direct formula:-

$x = 21$ km./hr.
$y = 9$ km./hr.

$S_c = \frac{1}{2} \times (21 - 9) = 6$ km./hr.

2.1; Speed of the swimmer down the stream = 14 km./hr.
and speed of the swimmer up the stream = 6 km./hr.

$\therefore$ Speed of the swimmer in still water

$= \frac{1}{2}(14 + 6) = \frac{20}{2} = 10$ km./hr.

Direct formula:-

$x = 14$ km./hr.
$y = 6$ km./hr.

$S_c = \frac{1}{2} \times (14 + 6) = 10$ km./hr.

3.5; Speed of the boat in still water = 4 km./hr.
and speed of the boat against the stream = 2 km./hr.

$\therefore 4 = \frac{1}{2}$ (2+ speed of the boat down the stream)

or, Speed of the boat down the stream
$= 4 \times 2 - 2 = 6$ km./hr.

$\therefore$ Velocity of the stream $= \frac{1}{2}(6 - 2)$
$= 2$ km./hr.

Direct formula:-

$S_b = 4$ km./hr.
$y = 2$ km./hr.
$S_c = ?$
$y = S_b - S_c$
or, $S_c = S_b - y = 4 - 2 = 2$ km./hr.

4.2; Let the speed of the boatman against the stream be a km./hr,

then $\frac{1}{2}(15 - a) = 1.5$

or, $15 - a = 3$

$\therefore a = 15 - 3 = 12$ km./hr.

Direct formula:-

$x = 15$ km./hr.
$S_c = 1.5$ km./hr.
$y = ?$

$S_c = \frac{1}{2}(x - y)$

$\Rightarrow 1.5 \times 2 = 15 - y$

$\Rightarrow y = 15 - 3 = 12$ km./hr.

5.4 Speed of the boat in still water

$= \frac{1}{2}$ (speed of the boat along the stream + speed of the boat against the stream)

$\therefore 7 = \frac{1}{2}(x + 2.5)$

or, $x = 14 - 2.5 = 11.5$ km./hr.

Direct formula:-

$S_b = 7$ km/hr.
$y = 2.5$ km/hr.
$x = ?$

$S_b = \frac{1}{2}(x + y)$

$\Rightarrow 7 \times 2 = x + 2.5$

$\Rightarrow x = 11.5$ km./hr.

6.2; Speed of the boat against the stream
$= S_b - S_c$
$= 9 - 2.5 = 6.5$ km./hr.

$\therefore$ Time taken by the boat to go 9.1 km. against thestream

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

$= \frac{9.1}{6.5} = \frac{7}{5} \Rightarrow$ 1 hour 24 minutes

Direct formula:-

S_b = 9 km./hr.
S_c = 2.5 km./hr.
D = 9.1 km.
$y = S_b - S_c = (9 - 2.5) = 6.5$km./hr.

$\therefore$ Required time $= \dfrac{9.1\ km}{6.5\ km/hrs}$

$= \dfrac{7}{5} hr$

= 1 hr. 24 min.

7.1; Speed of the swimmer along the stream $(x) = \dfrac{36}{6} = 6$ km/hr

and speed of the swimmer against the stream $(y) = \dfrac{40}{8} = 5$ km./hr.

$\therefore$ His speed in still water $= \dfrac{1}{2}(x + y)$

$= \dfrac{1}{2}(6+5) = 5.5$ km./hr.

Direct formula:-

D = 36 km. is 6hr. downstream
= 40 km. is 8 hr. upstream

$x = \dfrac{36}{6} = 6$ km/hr.

$y = \dfrac{40}{8} = 5$ km/hr.

$S_b = \dfrac{x+y}{2} = 5.5$ km/hr.

8.5; Speed of the man against the stream $= \dfrac{16}{4} = 4$ km./hr. and speed of the man along the stream $= \dfrac{36}{6} = 6$ km./hr.

$\therefore$ Speed of the stream $= \dfrac{1}{2}(x - y)$

$= \dfrac{1}{2}(6 - 4) = 1$ km./hr.

Direct formula:-

$y = \dfrac{16\ km}{4\ hr} = 4$ km/hr.

$x = \dfrac{36\ km}{6\ hr} = 6$ km /hr.

$S_c = \dfrac{1}{2}(x - y) = 1$ km/hr

9.3; Speed of the boat against the stream

$y = \dfrac{8\ km}{4\ hr} = 2$ kms/hr.

$S_c = 1.5$ km/hr., $S_b = ?$

$y = S_b - S_c \Rightarrow S_b = y + S_c = 2 + 1.5$

$S_b = 3.5$ kms/hr

10.4; Let the speed of the boat in still water be x km./hr.

$\therefore$ The speed of the boat along the stream = $(x + 1)$ km./hr.
and the speed of the boat against the stream = $(x - 1)$ km/hr.

$\therefore \quad \dfrac{4}{x+1} + \dfrac{4}{x-1} = 3$ hrs.

(because time $= \dfrac{\text{Dist.}}{\text{speed}}$)

[Note:- Go through the given options to get the answer quickly **]**

or, $\dfrac{4(x+1+x-1)}{(x+1)(x-1)} = 3$

or, $8x = 3x^2 - 3$

or, $3x^2 - 8x - 3 = 0$

or, $3x^2 - 9x + x - 3 = 0$

or, $(x - 3)(3x + 1) = 0$

$\therefore x = 3$ or, $-\dfrac{1}{3}$ (Speed cannot be in -ve)

Hence, the speed of the boat in still water is 3 km./hr.

11.2; Let the speed of the motorboat in still water be x km./hr.

$\therefore$ The speed of the motorboat along the stream = $(x + 5)$ km./hr.

and the speed of the motorboat against the stream = $(x - 5)$ km./hr.

$$\therefore \frac{10}{x+5}+\frac{10}{x-5}=\frac{50}{60}\text{ hrs.}$$

[Note:- Go through the given option to get the answer quickly **]**

$$\text{or, } \frac{10(x-5+x+5)}{(x+5)(x-5)}=\frac{5}{6}$$

$$\text{or, } 20x \times 6 = 5(x^2-25)$$

$$\Rightarrow 5x^2 - 125 = 120x$$

$$\Rightarrow 5(x^2-25) = 5(24x)$$

$$\Rightarrow x^2 - 25 - 24x = 0$$

$$\text{or, } x^2 - 24x - 25 = 0$$

$$\text{or, } x^2 - 25x + x - 25 = 0$$

$$x(x - 25) + 1(x - 25)$$

$$(x - 25)(x + 1) = 0$$

$x - 25 = 0$ **or** $x + 1 = 0$

$x = 25$ **or** -1

Now, ignore the - ve value of x

$\therefore$ $x = 25$ km./hr.

12.3; Distance between P and Q

[Here, t = 3, u = 9 and v = 3]

$$= \frac{t(u^2-v^2)}{2u} = \frac{3\times(9^2-3^2)}{18} = 12 \text{ km.}$$

12.3; **Other Method:-**

D = Distance in km.

$$\frac{D}{(9+3)}+\frac{D}{(9-3)}=3$$

$$\frac{D}{12}+\frac{D}{6}=3$$

$$\therefore D = \frac{3\times12\times6}{(6+12)} = 12 \text{ km.}$$

13;4 Let the distance of the place from the starting point be x km

$\therefore$ The speed of the man along the stream = 5 + 1.5 = 6.5 km./hr.

and the speed of the man against the stream = 5 - 1.5 = 3.5 km./hr.

$$\therefore \frac{x}{6.5}+\frac{x}{3.5}=1$$

$$\text{or, } 10x = 6.5 \times 3.5$$

$$\therefore x = \frac{22.75}{10} = 2.275 \text{ km.}$$

14.3; Speed of the boat along the stream $= x = 11$ km./hr.

andspeed of the boat against the stream = $y = 5$ km./hr.

$$\therefore \text{Speed of the boat in still water} = \frac{1}{2}(x+y)$$

$$= \frac{1}{2}(11+5)$$

$$S_b = \frac{16}{2} = 8 \text{ km/hr.}$$

15.4; Let the distance from P to Q be x km. and the velocity of the stream be y km./hr.

$$\therefore \frac{x}{4+y}+\frac{x}{4-y}=3$$

$\therefore$ Since equation is one and two expressions (x and y) are unknown. Hence the data is inadequate.

16.5; Speed of Anshu along the stream

$$= \frac{21}{3} = 7 \text{ km./hr.}$$

and the speed of Anshu against the stream $= \frac{15}{3} = 5$ km./hr.

$$\text{velocity of the stream} = \frac{1}{2}(7 - 5)$$

$$= 1 \text{ km/hr.}$$

17.4; $S_b = \frac{28}{3}$ km/hr.

$$\frac{\text{Time taken in upstream}}{\text{Time taken in downstream}} = \frac{3}{1}$$

$$\frac{\text{Speed upstream}}{\text{Speed downstream}} = \frac{1}{3} = \frac{y}{x}$$

$\left(\because\ t \propto \frac{1}{s}\right)$

Say $x = 3k$, $y = k$

$S_b = \frac{1}{2}(x + y) = 2k = \frac{28}{3}$

$\Rightarrow k = \frac{14}{3}$

Thus, $x = 14$ km./hr., $y = \frac{14}{3}$ km/hr.

$Sc = \frac{1}{2}[x - y] = \frac{1}{2}\left[14 - \frac{14}{3}\right]$

$= \frac{1}{2} \times 14 \times \frac{2}{3} = \frac{14}{3}$ km/hr.

$= 4\frac{2}{3}$ km./hr.

17.4; **Other Method:-**

	Down stream		**Upstream**
Time	1	:	3
Speed	3	:	1

Now, the ratio of the speed of boat in still water : Velocity of stream

$\frac{(3+1)}{2} : \frac{(3-1)}{2}$

$2 : 1$

$\downarrow \qquad \downarrow$

$\frac{28}{3} : \frac{28}{3} \times \frac{1}{2}$

$\therefore$ Velocity of stream $= \frac{14}{3} = 4\frac{2}{3}$ km.hr.

18;1 $S_c = 4$km/hr., $S_b = ?$

$D = 2 \times x$

$D = 3y$

$\Rightarrow 2x = 3y$

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

Now, $S_b = \frac{1}{2}(x + y)$

$= \frac{1}{2}\left[\frac{3}{2}y + y\right] = \frac{5}{4}y$

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

$\Rightarrow y = 4S_c = 16$ km/hr.

$S_b = 20$ km/hr.

18.1; **Other Method:-**

	Down stream		**Upstream**
Time	2	:	3
Speed	3	:	2

Now, the ratio of the speed of boat in still water : Velocity of stream

$\frac{(3+2)}{2} : \frac{(3-2)}{2}$

$5 : 1$

$\downarrow \qquad \downarrow$

$4 \times 5 = 20$ km./hr. 4 km./hr.

$\therefore S_b = 20$ km./hr.

19.3; $\left[\frac{6}{y} + \frac{6}{x}\right] = 2$

Sc = 4 km./hr.

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

$\Rightarrow \frac{S_b - 4 + S_b + 4}{S_b^2 - 16} = \frac{2}{6} = \frac{1}{3}$

$\Rightarrow 2S_b \times 3 = S_b^2 - 16$

$\Rightarrow S_b^2 - 6S_b - 16$

$\Rightarrow S_b^2 - 8S_b + 2S_b - 16 = 0$

$\Rightarrow (S_b - 8)\ (S_b + 2) = 0$

$\Rightarrow S_b = 8$ km/hr.(since $S_b = -2$ is not possible)

20.3; $\frac{12}{y} + \frac{18}{x} = 3$ _____(i)

$\frac{36}{y} + \frac{24}{x} = \frac{13}{2}$ _____(ii)

To equate (i) & (ii)
Multiply (i) by 3 first

$\frac{36}{y} + \frac{54}{x} = 9$ _____(iii)

$\frac{36}{y} + \frac{24}{x} = \frac{13}{2}$ _____(iv)

Substracting (iv) from (iii)

$\frac{30}{x} = 9 - \frac{13}{2} = \frac{5}{2}$

$\Rightarrow x = 12$ km/hr.

Now, put value of x in eqn. (i), we get y = 8 km./hr.

$\therefore S_c = \frac{12-8}{2} = 2$km./hr.

6 TIME AND DISTANCE

CHAPTER

1. A person covers a certain distance at the speed of 60km/hr and returns to the starting point at a speed of 40km/hr. Find the average speed of the person for the whole journey.
   (1) 50 km (2) 48 km
   (3) 45 km (4) 42.5 km
2. A bus travels for 7 hours, the first half at 30km/hr and the second half at 40km/hr. Find the distance.
   (1) 240 km (2) 230 km
   (3) 250 km (4) 260 km
3. Two person *x* and *y* walk from a place P at 5 km/hr. and 6 km/hr. respectively. How much distance will they be apart(in kms) after 4 hours.
   (i) If they walk in the same direction.
   (ii) If they walk in opposite direction.
   (1) 4, 44 (2) 5, 55
   (3) 4, 34 (4) 5, 44
4. A thief runs at a speed of 10m/s. A Policeman runs behind him at a speed of 12.5m/sec but after10 seconds the Policeman had started running. After how many meters, will the Policeman catch the thief?
   (1) 600 mtr. (2) 500 mtr.
   (3) 400 mtr. (4) 300 mtr.
5. Two persons cover the same distance at speed of 25 km/hr. and 30km/hr. respectively. Find the distance travelled if one person takes 25min. more than the other.
   (1) 62.5 km. (2) 63.9 km.
   (3) 60 km. (4) 72 km.
6. A person covers certain distance at a speed of 60km/hr and with stoppages he travels the same distance at a speed of 40km/hr. How many minutes/hour does he stop?
   (1) 30 min. (2) 26 min.
   (3) 20 min. (4) 35 min.
7. A bus running at a speed of 30km/hr. leaves Trivandrum at 10am and another bus running at a speed of 40km/hr. leaves the same place at 3pm in the same direction. How many kilometers from Trivandrum will they be together?
   (1) 600 km (2) 500 km
   (3) 300 km (4) 700 km
8. Two persons A and B walk from P to Q, which are at a distance of 21km, at 3km/hr. and 4km/hr. respectively, B reaches Q returns immediately and meets A at R. Find the distance from P to R.
   (1) 12 km (2) 16 km
   (3) 28 km (4) 18 km
9. A person starts by a car from Trivandrum to Kollam and at the same time another person starts from Kollam by a car to Trivandrum. After passing each other they complete their Journey in 2 hours and ½ hour respectively. At what rate does the second person drives the car if the first car runs at a speed of 40km/hr.?
   (1) 65km/hr. (2) 60km/hr.
   (3) 80km/hr. (4) 75km/hr.

10. A person covers a distance in 40 min. if he runs at a speed of 45 km/hr on an average. Find the speed at which he must run to reduce the time of Journey to 30min.
(1) 50 km (2) 35 km
(3) 60 km (4) 36 km

11. At what speed does a man walk who passes through a street 600 metre long in 5 minutes ?
(1) 9/5 km/hr.
(2) 18/5 km/hr.
(3) 27/5 km/hr.
(4) 36/5 km/hr.

12. A man takes 6 hours and 30 mins in walking to a certain place and riding back. He would have gained 2 hours 10minutes by riding both ways. How long would he take to walk both ways?
(1) 480 min. (2) 520 mins.
(3) 560 mins. (4) 600 mins.

13. A motor car finishes a journey in 10hrs. the first half at 21km/hr. and the rest at 24km/hr. Find the distance?
(1) 220 km (2) 224 km
(3) 220 km (4) 232 km

14. A person has to reach a certain place at a certain time and he finds that he will be 15 minutes late if he walks at 4km/hr. and 10 min earlier, if he walks at 6kms/hr. Find the distance he has to cover?
(1) 3 km (2) 4 km
(4) 5 km (4) 6 km

15. Two buses start at the same time from two bus stations and proceed towards each other at the rate of 20km/hr. and 25km/hr. respectively. When they meet one bus may have travelled 80kms more than the other. Find the distance between the two bus stations.
(1) 680 km (2) 700 km
(3) 710 km (4) 720 km

16. A person travelled a certain distance by train at a speed of 25km/hr and walked back at a speed of 4km/hr. The whole journey took 5 hour 48 minutes. What distance did he travel ?
(1) 29 km (2) 25 km
(3) 20 km (4) 14 km

17. A thief is spotted by a policeman from a distance of 200 metres. When the policeman started running after the thief, the thief also started running. Assuming the speed of the thief to be 10km/hr. and that of policeman 12km/hr, how far will the thief have run before he is overtaken by the policeman ?
(1) 1 km (2) 2 km
(3) 3 km (4) 4 km

18. Two trains start from P and Q respectively and travel towards each other at a speed of 50km/hr. and 40km/hr. respectively. By the time they met the first train had travelled 100km more than the second. Find the distance between P and Q ?
(1) 500 km (2) 630 km
(3) 660 km (4) 900 km

19. A thief steals a car at 2:30pm and drives it at 60km/hr. The theft is discovered at 3pm. and the owner sets off in another car at 75km/hr to catch the thief.When will he overtake the thief ?
(1) 4:30 pm (2) 4:45 pm
(3) 5 pm (4) 5:15 pm

20. With a uniform speed a car covers a certain distance in 8 hours. If speed been increased by 4km/hr. the same distance could have been covered in $7\frac{1}{2}$ hrs. what distance did he cover ?
(1) 420 km (2) 480 km
(3) 640 km
(4) Cannot be determined