

Arithmetic (Level 2)**MCQ Test, Set 10**

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

1. There are 25 questions. Each has exactly one correct answer: choose A, B, C or D.
2. Each correct answer carries 1 mark. There is no negative marking.
3. The key sheet and worked solutions are at the end of this test.

1. A can finish a piece of work in 12 days. What part of the work does A finish in 2 days?
A. $\frac{1}{6}$ **B.** 6 **C.** $\frac{5}{6}$ **D.** $\frac{1}{12}$
2. If the number of men to do a work is changed in the ratio 3 : 1, the time taken by them to finish the work changes in the ratio
A. 3 : 1 **B.** 1 : 9 **C.** 9 : 1 **D.** 1 : 3
3. A can finish a piece of work in 54 days and B can finish it in 36 days. In how many days can they finish it working together?
A. 45 days **B.** 90 days **C.** $21\frac{3}{5}$ days **D.** 18 days
4. A and B together can finish a piece of work in 34 days. A alone can do it in 51 days. In how many days can B alone do it?
A. $20\frac{2}{5}$ days **B.** 102 days **C.** $42\frac{1}{2}$ days **D.** 17 days
5. A, B and C together can finish a piece of work in 9 days. A and B together can finish it in 12 days. In how many days can C alone finish it?
A. $5\frac{1}{7}$ days **B.** 3 days **C.** $10\frac{1}{2}$ days **D.** 36 days
6. A can do a piece of work in 44 days and B can finish it in 24 days. They work together for 12 days and then B goes away. In how many days will A finish the remaining work?
A. $5\frac{5}{11}$ days **B.** 32 days **C.** $41\frac{1}{6}$ days **D.** 10 days
7. A can do a piece of work in 51 days and B can finish it in 15 days. They work together for 5 days and then B goes away. In how many days will A finish the remaining work?
A. $46\frac{3}{5}$ days **B.** 46 days **C.** 29 days **D.** 23 days
8. A can do a piece of work in 20 days and B in 15 days. They work together for 6 days. The rest of the work is finished by C in 7 days. If they get ₹2100 for the whole work, what is A's share?
A. ₹840 **B.** ₹700 **C.** ₹630 **D.** ₹105
9. A is thrice as good a workman as B and is therefore able to finish a piece of work in 52 days less than B. How many days does A take to finish it alone?
A. 156 days **B.** 78 days **C.** $17\frac{1}{3}$ days **D.** 26 days

10. A can do a piece of work in 30 days, B in 10 days and C in 27 days. All begin together, but A leaves the work after 2 days and B leaves 3 days before the work is finished. How long did the work last?
- A. 6 days B. 9 days C. 12 days D. 4 days
-
11. A can do a piece of work in 80 days and B can do it in 96 days. They work together for 4 days. Then B leaves and A alone continues the work. 10 days after that, C joins A and the work is completed in 36 days more. In how many days can C do the work alone?
- A. 188 days B. 216 days C. 108 days D. 72 days
-
12. A and B together can do a piece of work in 33 days. B and C together can do it in 44 days. If A is twice as good a workman as C, C alone can do it in
- A. 264 days B. 132 days C. 11 days D. 66 days
-
13. A and B working alone can finish a piece of work in 14 and 17 days respectively. If they work at it alternately for a day, A beginning, in how many days will the work be finished?
- A. $15\frac{2}{7}$ days B. $16\frac{2}{7}$ days C. 15 days D. 16 days
-
14. A certain number of men complete a piece of work in 60 days. If there were 22 men more, the work could be finished in 24 days less. How many men were there originally?
- A. 11 B. 33 C. 55 D. 77
-
15. If 7 men or 15 boys can finish a piece of work in 12 days, in how many days can 7 men and 3 boys finish it?
- A. 18 days B. $14\frac{2}{5}$ days C. $8\frac{2}{5}$ days D. 10 days
-
16. 7 men and 6 women working 10 hours a day finish a piece of work in 3 days; 8 men and 8 women working 6 hours a day do the same work in 4 days. Find the number of days in which the work is done by 4 men only, working 6 hours a day.
- A. $16\frac{1}{4}$ days B. 20 days C. $13\frac{3}{4}$ days D. 12 days
-
17. If 6 men with 5 boys can earn ₹4680 in 4 days and 12 men with 6 boys can earn ₹16800 in 8 days, in what time will 9 men with 9 boys earn ₹16605?
- A. $4\frac{1}{2}$ days B. 9 days C. 11 days D. 7 days
-
18. 15 men are employed to do a piece of work which they could finish in 28 days, but the men drop off by 3 at the end of every 15 days. In what time will the work be completed?
- A. 45 days B. 35 days C. $31\frac{2}{3}$ days D. 28 days
-
19. A can do half as much again as B can do in the same time. A alone can do a piece of work in 40 days. In how many days can both together finish it?
- A. 24 days B. 36 days C. 30 days D. 50 days
-
20. The speed of a boat in still water is 5.5 km/hr and the speed of the stream is 2.5 km/hr. The speed of the boat upstream is
- A. 3 km/hr B. 5.5 km/hr C. 8 km/hr D. 4 km/hr
-

21. A man rows upstream 23 km and downstream 39 km, taking 5 hours each time. The velocity of the current is
- A. 6.2 km/hr B. 3.2 km/hr C. 1.6 km/hr D. 4.2 km/hr
-
22. A man can row 12 km/hr in still water and he finds that it takes him twice as long to row up as to row down the river. The rate of the stream is
- A. 8 km/hr B. 10 km/hr C. 4 km/hr D. 6 km/hr
-
23. A man can row 12.5 km/hr in still water. If the river is running at 6 km/hr, it takes him 1 hour 30 minutes to row to a place and back. The place is at a distance of
- A. 14.43 km B. 9.75 km C. 9.375 km D. 7.215 km
-
24. The current of a stream runs at the rate of 1 km/hr. A motor boat goes 8 km upstream and back again to the starting point in 2 hours 20 minutes. The speed of the motor boat in still water is
- A. 7 km/hr B. 6 km/hr C. 8 km/hr D. 9 km/hr
-
25. A man can row 6 km upstream and 24 km downstream in 9 hours, while he can row 12 km upstream and 12 km downstream in 9 hours. The rate of the current is
- A. 1 km/hr B. 4 km/hr C. 3 km/hr D. 2 km/hr
-

Key sheet

1. A	2. D	3. C	4. B	5. D
6. D	7. C	8. C	9. D	10. B
11. C	12. B	13. A	14. B	15. D
16. B	17. B	18. C	19. A	20. A
21. C	22. C	23. D	24. A	25. A

Solutions

1. A can finish a piece of work in 12 days. What part of the work does A finish in 2 days?

$$\text{A's 1 day's work} = \frac{1}{12}$$

$$\text{A's 2 days' work} = 2 \times \frac{1}{12} = \frac{2}{12} = \frac{1}{6}$$

Ans: (A) $\frac{1}{6}$

2. If the number of men to do a work is changed in the ratio 3 : 1, the time taken by them to finish the work changes in the ratio

$$\text{No. of men} \propto \frac{1}{\text{Time taken}}$$

$$\frac{T_1}{T_2} = \frac{M_2}{M_1} = \frac{1}{3}$$

$$\therefore T_1 : T_2 = 1 : 3$$

Ans: (D) 1 : 3

3. A can finish a piece of work in 54 days and B can finish it in 36 days. In how many days can they finish it working together?

$$\text{A's 1 day's work} = \frac{1}{54}$$

$$\text{B's 1 day's work} = \frac{1}{36}$$

$$\therefore (\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{54} + \frac{1}{36} = \frac{2+3}{108} = \frac{5}{108}$$

$$\therefore \text{Both together can finish the work in } \frac{108}{5} \text{ days} = 21\frac{3}{5} \text{ days}$$

Ans: (C) $21\frac{3}{5}$ days

4. A and B together can finish a piece of work in 34 days. A alone can do it in 51 days. In how many days can B alone do it?

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{34}$$

$$\text{A's 1 day's work} = \frac{1}{51}$$

$$\Rightarrow \text{B's 1 day's work} = \frac{1}{34} - \frac{1}{51} = \frac{3-2}{102} = \frac{1}{102}$$

$$\therefore \text{B alone can finish the work in 102 days.}$$

Ans: (B) 102 days

5. A, B and C together can finish a piece of work in 9 days. A and B together can finish it in 12 days. In how many days can C alone finish it?

$$(\text{A} + \text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{9}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{12}$$

$$\text{C's 1 day's work} = (\text{A} + \text{B} + \text{C})\text{'s 1 day's work} - (\text{A} + \text{B})\text{'s 1 day's work}$$

$$= \frac{1}{9} - \frac{1}{12} = \frac{4-3}{36} = \frac{1}{36}$$

$$\therefore \text{C alone can finish the work in 36 days}$$

Ans: (D) 36 days

6. A can do a piece of work in 44 days and B can finish it in 24 days. They work together for 12 days and then B goes away. In how many days will A finish the remaining work?

$$\text{A's 1 day's work} = \frac{1}{44}$$

$$\text{B's 1 day's work} = \frac{1}{24}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{44} + \frac{1}{24} = \frac{6+11}{264} = \frac{17}{264}$$

$$(\text{A} + \text{B})\text{'s 12 days' work} = 12 \times \frac{17}{264} = \frac{17}{22}$$

$$\text{Remaining work} = 1 - \frac{17}{22} = \frac{5}{22}$$

$$\text{This work is done by A in } \frac{5}{22} \times 44 = 10 \text{ days}$$

Ans: (D) 10 days

7. A can do a piece of work in 51 days and B can finish it in 15 days. They work together for 5 days and then B goes away. In how many days will A finish the remaining work?

$$\text{A's 1 day's work} = \frac{1}{51}$$

$$\text{B's 1 day's work} = \frac{1}{15}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{51} + \frac{1}{15} = \frac{5+17}{255} = \frac{22}{255}$$

$$(\text{A} + \text{B})\text{'s 5 days' work} = 5 \times \frac{22}{255} = \frac{22}{51}$$

$$\text{Remaining work} = 1 - \frac{22}{51} = \frac{29}{51}$$

$$\text{This work is done by A in } \frac{29}{51} \times 51 = 29 \text{ days}$$

Ans: (C) 29 days

8. A can do a piece of work in 20 days and B in 15 days. They work together for 6 days. The rest of the work is finished by C in 7 days. If they get ₹2100 for the whole work, what is A's share?

$$\text{A's 1 day's work} = \frac{1}{20}, \text{ B's 1 day's work} = \frac{1}{15}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{20} + \frac{1}{15} = \frac{3+4}{60} = \frac{7}{60}$$

$$(\text{A} + \text{B})\text{'s 6 days' work} = \frac{7}{10}$$

$$\text{Remaining work} = 1 - \frac{7}{10} = \frac{3}{10}, \text{ done by C in 7 days}$$

$$\text{A's 6 days' work} = \frac{6}{20} = \frac{3}{10}, \text{ B's 6 days' work} = \frac{6}{15} = \frac{2}{5}, \text{ C's 7 days' work} = \frac{3}{10}$$

$$\text{Consider } \frac{3}{10} : \frac{2}{5} : \frac{3}{10} = 3 : 4 : 3$$

$$\text{A's share} = 3 \times \frac{2100}{10} = 630, \text{ i.e. ₹630}$$

Ans: (C) ₹630

9. A is thrice as good a workman as B and is therefore able to finish a piece of work in 52 days less than B. How many days does A take to finish it alone?

Suppose B finishes the work in x days

$\Rightarrow$ A is able to finish it in $(x - 52)$ days

Time taken by A = $\frac{1}{3}$ (Time taken by B)

$$\therefore x - 52 = \frac{1}{3}x$$

$$\Rightarrow 3x - 156 = x \Rightarrow 2x = 156 \Rightarrow x = 78$$

$\therefore$ Time taken by B = 78 days, time taken by A = 26 days

Ans: (D) 26 days

10. A can do a piece of work in 30 days, B in 10 days and C in 27 days. All begin together, but A leaves the work after 2 days and B leaves 3 days before the work is finished. How long did the work last?

$$\text{A's 1 day's work} = \frac{1}{30}, \text{ B's} = \frac{1}{10}, \text{ C's} = \frac{1}{27}$$

A, B, C together work for 2 days; C alone works for the last 3 days; B and C work together in between.

$$(\text{A} + \text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{30} + \frac{1}{10} + \frac{1}{27} = \frac{9+27+10}{270} = \frac{46}{270} = \frac{23}{135}$$

$$(\text{A} + \text{B} + \text{C})\text{'s 2 days' work} = 2 \times \frac{23}{135} = \frac{46}{135}$$

$$\text{C's 3 days' work} = 3 \times \frac{1}{27} = \frac{1}{9}$$

$$\text{Remaining work} = 1 - \left(\frac{46}{135} + \frac{1}{9} \right) = \frac{74}{135}$$

$$(\text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{10} + \frac{1}{27} = \frac{27+10}{270} = \frac{37}{270}$$

$$\text{Remaining work is done by (B + C) in } \frac{74}{135} \div \frac{37}{270} = 4 \text{ days}$$

$$\text{Total time} = 2 + 4 + 3 = 9 \text{ days}$$

Ans: (B) 9 days

11. A can do a piece of work in 80 days and B can do it in 96 days. They work together for 4 days. Then B leaves and A alone continues the work. 10 days after that, C joins A and the work is completed in 36 days more. In how many days can C do the work alone?

$$\text{A's 1 day's work} = \frac{1}{80}, \text{ B's 1 day's work} = \frac{1}{96}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{80} + \frac{1}{96} = \frac{6+5}{480} = \frac{11}{480}$$

$$(\text{A} + \text{B})\text{'s 4 days' work} = 4 \times \frac{11}{480} = \frac{11}{120}$$

$$\text{A's 10 days' work} = \frac{10}{80} = \frac{1}{8}$$

$$(\text{A} + \text{C})\text{'s 36 days' work} = 1 - \left(\frac{11}{120} + \frac{1}{8} \right) = \frac{47}{60}$$

$$\Rightarrow (\text{A} + \text{C})\text{'s 1 day's work} = \frac{47}{60} \div 36 = \frac{47}{2160}$$

$$\text{C's 1 day's work} = \frac{47}{2160} - \frac{1}{80} = \frac{47-27}{2160} = \frac{20}{2160} = \frac{1}{108}$$

C can finish the work in 108 days

Ans: (C) 108 days

12. A and B together can do a piece of work in 33 days. B and C together can do it in 44 days. If A is twice as good a workman as C, C alone can do it in

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{33}, (\text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{44}$$

$$\text{A's 1 day's work} = \text{C's 2 days' work}$$

$$\text{C's 2 days' work} + \text{B's 1 day's work} = \frac{1}{33}$$

$$\Rightarrow \text{C's 1 day's work} + (\text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{33}$$

$$\Rightarrow \text{C's 1 day's work} + \frac{1}{44} = \frac{1}{33}$$

$$\text{C's 1 day's work} = \frac{1}{33} - \frac{1}{44} = \frac{4-3}{132} = \frac{1}{132}$$

$\therefore$ C alone can finish it in 132 days

Ans: (B) 132 days

13. A and B working alone can finish a piece of work in 14 and 17 days respectively. If they work at it alternately for a day, A beginning, in how many days will the work be finished?

$$\text{A's 1 day's work} = \frac{1}{14}, \text{ B's 1 day's work} = \frac{1}{17}$$

$$\text{Work done in the first 2 days} = \frac{1}{14} + \frac{1}{17} = \frac{17+14}{238} = \frac{31}{238}$$

$$\text{Work done in the first 14 days} = 7 \times \frac{31}{238} = \frac{31}{34}$$

$$\text{On day 15 it is A's turn: work done in the first 15 days} = \frac{31}{34} + \frac{1}{14} = \frac{117}{119}$$

$$\text{Remaining work} = 1 - \frac{117}{119} = \frac{2}{119}$$

$$\text{B does it in } \frac{2}{119} \div \frac{1}{17} = \frac{2}{7} \text{ day}$$

$$\therefore \text{Total no. of days} = 15 + \frac{2}{7} = 15\frac{2}{7} \text{ days}$$

Ans: (A) $15\frac{2}{7}$ days

14. A certain number of men complete a piece of work in 60 days. If there were 22 men more, the work could be finished in 24 days less. How many men were there originally?

Let the original number of men be x

$$\text{No. of men} \propto \frac{1}{\text{No. of days}}$$

$$x \times 60 = (x + 22) \times 36$$

$$60x = 36x + 792$$

$$24x = 792 \Rightarrow x = 33$$

Ans: (B) 33

15. If 7 men or 15 boys can finish a piece of work in 12 days, in how many days can 7 men and 3 boys finish it?

$$7 \text{ men} = 15 \text{ boys}$$

$$7 \text{ men} = \frac{15}{7} \times 7 = 15 \text{ boys}$$

$$7 \text{ men} + 3 \text{ boys} = 15 \text{ boys} + 3 \text{ boys} = 18 \text{ boys}$$

$$\text{No. of boys} \propto \frac{1}{\text{No. of days}}$$

$$15 \times 12 = 18 \times x \Rightarrow x = 10 \text{ days}$$

Ans: (D) 10 days

16. 7 men and 6 women working 10 hours a day finish a piece of work in 3 days; 8 men and 8 women working 6 hours a day do the same work in 4 days. Find the number of days in which the work is done by 4 men only, working 6 hours a day.

Let 1 man do m and 1 woman do w units of work in 1 hour.

$$\text{Case (i): } (7m + 6w) \times 10 \times 3 = 210m + 180w$$

$$\text{Case (ii): } (8m + 8w) \times 6 \times 4 = 192m + 192w$$

$$\text{Same work: } 210m + 180w = 192m + 192w$$

$$\Rightarrow 12w = 18m \Rightarrow 2w = 3m$$

$$\text{So 6 women} = 9 \text{ men, and } 7m + 6w = 16 \text{ men}$$

16 men working 10 hours a day for 3 days do the same work as 4 men working 6 hours a day for x days

$$16 \times 10 \times 3 = 4 \times 6 \times x \Rightarrow x = 20 \text{ days}$$

Ans: (B) 20 days

17. If 6 men with 5 boys can earn ₹4680 in 4 days and 12 men with 6 boys can earn ₹16800 in 8 days, in what time will 9 men with 9 boys earn ₹16605?

Let 1 man earn ₹ x and 1 boy earn ₹ y in 1 day.

$$(6x + 5y) \times 4 = 4680 \Rightarrow 6x + 5y = 1170 \quad \dots (1)$$

$$(12x + 6y) \times 8 = 16800 \Rightarrow 12x + 6y = 2100 \quad \dots (2)$$

$$(1) \times 2 \Rightarrow 12x + 10y = 2340$$

$$(1) \times 2 - (2) \Rightarrow 4y = 240 \Rightarrow y = 60$$

$$\text{From (1): } 6x = 1170 - 300 = 870 \Rightarrow x = 145$$

$$(9x + 9y)n = 16605$$

$$\Rightarrow (1305 + 540)n = 16605 \Rightarrow 1845n = 16605$$

$$\Rightarrow n = 9 \text{ days}$$

Ans: (B) 9 days

18. 15 men are employed to do a piece of work which they could finish in 28 days, but the men drop off by 3 at the end of every 15 days. In what time will the work be completed?

$$\text{Work done by 15 men in 15 days} = 15 \times \frac{1}{28} = \frac{15}{28}$$

$$\text{So 1 man's work in 15 days} = \frac{15}{28} \div 15 = \frac{1}{28}$$

$$\text{Remaining work} = \frac{13}{28}, \text{ remaining men} = 12; \text{ work done by 12 men in 15 days} = 12 \times \frac{1}{28} = \frac{3}{7}$$

$$\text{Remaining work} = \frac{1}{28}, \text{ remaining men} = 9; \text{ work done by 9 men in 15 days} = \frac{9}{28}$$

$$\frac{1}{28} \text{ work is done by 9 men in } \frac{1}{28} \div \frac{9}{28} \times 15 = 1\frac{2}{3} \text{ days}$$

$$\text{Total time} = 15 + 15 + 1\frac{2}{3} = 31\frac{2}{3} \text{ days}$$

Ans: (C) $31\frac{2}{3}$ days

19. A can do half as much again as B can do in the same time. A alone can do a piece of work in 40 days. In how many days can both together finish it?

$$\text{If B does } x, \text{ A does } \frac{x}{2} + x = \frac{3x}{2} \text{ in the same time}$$

$$\text{Ratio of working of A and B} = \frac{3}{2} : 1 = 3 : 2$$

$$\text{Ratio of time taken for the same work} = 2 : 3$$

$$\text{Time taken by A} = 2k = 40 \Rightarrow k = 20$$

$$\text{Time taken by B} = 3k = 60 \text{ days}$$

$$\text{A's 1 day's work} = \frac{1}{40}, \text{ B's 1 day's work} = \frac{1}{60}$$

$$(A + B)\text{'s 1 day's work} = \frac{1}{40} + \frac{1}{60} = \frac{3+2}{120} = \frac{5}{120} = \frac{1}{24}$$

$$\text{Time taken by (A + B) to finish the work} = 24 \text{ days}$$

Ans: (A) 24 days

20. The speed of a boat in still water is 5.5 km/hr and the speed of the stream is 2.5 km/hr. The speed of the boat upstream is

$$\text{Speed upstream} = (x - y) \text{ km/hr}$$

$$= 5.5 - 2.5 = 3 \text{ km/hr}$$

Ans: (A) 3 km/hr

21. A man rows upstream 23 km and downstream 39 km, taking 5 hours each time. The velocity of the current is

$$\text{Speed downstream: } x + y = \frac{39}{5} \text{ km/hr}$$

$$\text{Speed upstream: } x - y = \frac{23}{5} \text{ km/hr}$$

$$\text{Subtracting, } 2y = \frac{39}{5} - \frac{23}{5} = \frac{16}{5}$$

$$y = \frac{16}{10} = 1.6 \text{ km/hr}$$

Ans: (C) 1.6 km/hr

22. A man can row 12 km/hr in still water and he finds that it takes him twice as long to row up as to row down the river. The rate of the stream is

Let the rate of the stream be y km/hr

Same distance, twice the time, so speed down = $2 \times$ speed up

$$\text{Given } 2(12 - y) = 12 + y$$

$$\Rightarrow 24 - 2y = 12 + y \Rightarrow 3y = 12$$

$$\Rightarrow y = 4 \text{ km/hr}$$

Ans: (C) 4 km/hr

23. A man can row 12.5 km/hr in still water. If the river is running at 6 km/hr, it takes him 1 hour 30 minutes to row to a place and back. The place is at a distance of

Let the required distance be d km

$$\text{Speed downstream} = 12.5 + 6 = 18.5 \text{ km/hr}$$

$$\text{Speed upstream} = 12.5 - 6 = 6.5 \text{ km/hr}$$

$$\text{Total time} = 1 \text{ hour } 30 \text{ minutes} = 1.5 \text{ hours}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}, \text{ so } \frac{d}{18.5} + \frac{d}{6.5} = 1.5$$

$$\Rightarrow d \left(\frac{2}{37} + \frac{2}{13} \right) = 1.5$$

$$\Rightarrow d \times \frac{100}{481} = 1.5$$

$$\Rightarrow d = 7.215 \text{ km}$$

Ans: (D) 7.215 km

24. The current of a stream runs at the rate of 1 km/hr. A motor boat goes 8 km upstream and back again to the starting point in 2 hours 20 minutes. The speed of the motor boat in still water is

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

$$\text{Speed upstream} = (x - 1) \text{ km/hr, speed downstream} = (x + 1) \text{ km/hr}$$

$$\text{Total time} = 140 \text{ min} = \frac{140}{60} \text{ hr} = \frac{7}{3} \text{ hr}$$

$$\frac{8}{x-1} + \frac{8}{x+1} = \frac{7}{3}$$

$$\Rightarrow 8 \left(\frac{(x+1)+(x-1)}{(x-1)(x+1)} \right) = \frac{7}{3}$$

$$\Rightarrow \frac{16x}{x^2-1} = \frac{7}{3}$$

$$\Rightarrow 48x = 7x^2 - 7$$

$$\Rightarrow 7x^2 - 48x - 7 = 0$$

$$\Rightarrow (x - 7)(7x + 1) = 0$$

$$\Rightarrow x = 7 \text{ (or) } x = -\frac{1}{7} \text{ (rejected, a speed cannot be negative)}$$

$\therefore$ Speed of the boat in still water = 7 km/hr

Ans: (A) 7 km/hr

25. A man can row 6 km upstream and 24 km downstream in 9 hours, while he can row 12 km upstream and 12 km downstream in 9 hours. The rate of the current is

Let the speed of the man in still water be x km/hr and the rate of the current y km/hr.

Speed upstream = $(x - y)$ km/hr, speed downstream = $(x + y)$ km/hr. Put $p = \frac{1}{x-y}$, $q = \frac{1}{x+y}$

$$\frac{6}{x-y} + \frac{24}{x+y} = 9 \Rightarrow 6p + 24q = 9 \quad \dots (1)$$

$$\frac{12}{x-y} + \frac{12}{x+y} = 9 \Rightarrow 12p + 12q = 9 \quad \dots (2)$$

$$(1) \times 2 \Rightarrow 12p + 48q = 18$$

$$(1) \times 2 - (2) \Rightarrow 36q = 9 \Rightarrow q = \frac{1}{4}$$

$$\text{From (1): } 6p + 6 = 9 \Rightarrow 6p = 3 \Rightarrow p = \frac{1}{2}$$

So $x - y = 2$ and $x + y = 4$

Adding, $2x = 6 \Rightarrow x = 3$; then $y = 4 - 3 = 1$

Ans: (A) 1 km/hr
