EXPRESSWALA ACADEMY

Arithmetic (Level 2)

MCQ Test, Set 02

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 is twice as good a workman as B. A can finish a piece of work in 27 days. How many days will B take to finish it?

A. 29 days **B.** $13\frac{1}{2}$ days **C.** 54 days **D.** 81 days

2. If the number of men to do a work is changed in the ratio $3:4$, the time taken by them to finish the work changes in the ratio

A. $3:4$ **B.** $4:3$ **C.** $9:16$ **D.** $16:9$

3. A can finish a piece of work in 35 days and B can finish it in 15 days. In how many days can they finish it working together?

A. 20 days **B.** $10\frac{1}{2}$ days **C.** 50 days **D.** 25 days

4. A and B together can finish a piece of work in 28 days. A alone can do it in 77 days. In how many days can B alone do it?

A. 44 days **B.** 49 days **C.** 105 days **D.** $52\frac{1}{2}$ days

5. A, B and C together can finish a piece of work in 24 days. B and C together can finish it in 60 days. In how many days can A alone finish it?

A. 36 days **B.** $17\frac{1}{7}$ days **C.** 42 days **D.** 40 days

6. A can do a piece of work in 36 days and B can finish it in 18 days. They work together for 7 days and then B goes away. In how many days will A finish the remaining work?

A. 33 days **B.** 15 days **C.** 29 days **D.** $7\frac{1}{2}$ days

7. A can do a piece of work in 40 days and B in 12 days. They work together for 5 days. The rest of the work is finished by C in 4 days. If they get ₹960 for the whole work, what is C's daily wage?

A. ₹440 **B.** ₹80 **C.** ₹24 **D.** ₹110

8. A is thrice as good a workman as B and is therefore able to finish a piece of work in 20 days less than B. How many days does A take to finish it alone?

A. 10 days **B.** 60 days **C.** 30 days **D.** $6\frac{2}{3}$ days

9. A can do a piece of work in 32 days, B in 24 days and C in 16 days. All begin together, but A leaves the work after 4 days and B leaves 4 days before the work is finished. How long did the work last?

A. 10 days **B.** 14 days **C.** 6 days **D.** 2 days

10. A can do a piece of work in 56 days and B can do it in 160 days. They work together for 12 days. Then B leaves and A alone continues the work. 17 days after that, C joins A and the work is completed in 6 days more. In how many days can C do the work alone?

A. 14 days **B.** 20 days **C.** 76 days **D.** 40 days

11. A and B together can do a piece of work in 27 days. B and C together can do it in 36 days. If A is twice as good a workman as C, A alone can do it in

A. 216 days **B.** 54 days **C.** 9 days **D.** 108 days

12. A and B working alone can finish a piece of work in 16 and 4 days respectively. If they work at it alternately for a day, B beginning, in how many days will the work be finished?

A. 7 days **B.** $6\frac{2}{5}$ days **C.** $6\frac{1}{4}$ days **D.** $3\frac{1}{5}$ days

13. A certain number of men complete a piece of work in 52 days. If there were 12 men more, the work could be finished in 24 days less. How many men were there originally?

A. 38 **B.** 2 **C.** 14 **D.** 26

14. If 2 men or 6 boys can finish a piece of work in 11 days, in how many days can 3 men and 2 boys finish it?

A. 22 days **B.** $20\frac{1}{6}$ days **C.** $13\frac{1}{5}$ days **D.** 6 days

15. 6 men and 6 women working 5 hours a day finish a piece of work in 8 days; 8 men and 6 women working 7 hours a day do the same work in 5 days. Find the number of days in which the work is done by 8 men only, working 5 hours a day.

A. 14 days **B.** 70 days **C.** $10\frac{1}{2}$ days **D.** 12 days

16. If 3 men with 2 boys can earn ₹2240 in 7 days and 6 men with 7 boys can earn ₹8360 in 11 days, in what time will 4 men with 3 boys earn ₹5280?

A. $9\frac{3}{7}$ days **B.** 12 days **C.** $16\frac{1}{2}$ days **D.** 14 days

17. 40 men are employed to do a piece of work which they could finish in 18 days, but the men drop off by 5 at the end of every 6 days. In what time will the work be completed?

A. $21\frac{3}{5}$ days **B.** 24 days **C.** $20\frac{4}{7}$ days **D.** 18 days

18. A can do half as much again as B can do in the same time. B alone can do a piece of work in 30 days. In how many days can A alone finish it?

A. 10 days **B.** 15 days **C.** 45 days **D.** 20 days

19. The speed of a boat in still water is 10.5 km/hr and the speed of the stream is 0.5 km/hr. The speed of the boat downstream is

A. 5 km/hr **B.** 10.5 km/hr **C.** 11 km/hr **D.** 10 km/hr

20. A man can row downstream at the rate of 9 km/hr and upstream at 3 km/hr. The man's rate in still water is

A. 4.5 km/hr **B.** 12 km/hr **C.** 3 km/hr **D.** 6 km/hr

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21. A man rows upstream 32 km and downstream 62 km, taking 4 hours each time. The man's speed in still water is

A. 3.75 km/hr **B.** 23.5 km/hr **C.** 15.5 km/hr **D.** 11.75 km/hr

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22. The rate of a stream is 3.5 km/hr. A man finds that it takes him twice as long to row up the river as to row down. The man's rate in still water is

A. 14 km/hr **B.** 10.5 km/hr **C.** 5.5 km/hr **D.** 7 km/hr

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23. A man can row 20 km/hr in still water. If the river is running at 4 km/hr, it takes him 1 hour 30 minutes to row to a place and back. The place is at a distance of

A. 28.8 km **B.** 24 km **C.** 14.4 km **D.** 15 km

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24. The current of a stream runs at the rate of 5 km/hr. A motor boat goes 14 km upstream and back again to the starting point in 1 hour 35 minutes. The speed of the motor boat in still water is

A. 29 km/hr **B.** 24 km/hr **C.** 19 km/hr **D.** 14 km/hr

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25. A man can row 6 km upstream and 64 km downstream in 5 hours, while he can row 30 km upstream and 16 km downstream in 6 hours. The rate of the current is

A. 5 km/hr **B.** 10 km/hr **C.** 6 km/hr **D.** 11 km/hr

Key sheet

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

Solutions

1. A is twice as good a workman as B. A can finish a piece of work in 27 days. How many days will B take to finish it?

Time taken by A $= \frac{1}{2}\times$ (Time taken by B)
$27 = \frac{1}{2}\times$ (Time taken by B)
$\therefore$ Time taken by B $= 2 \times 27 = 54$ days

Ans: (C) 54 days

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2. If the number of men to do a work is changed in the ratio $3 : 4$, the time taken by them to finish the work changes in the ratio

No. of men $\propto \frac{1}{\text{Time taken}}$
$\frac{T_1}{T_2} = \frac{M_2}{M_1} = \frac{4}{3}$
$\therefore T_1 : T_2 = 4 : 3$

Ans: (B) $4 : 3$

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3. A can finish a piece of work in 35 days and B can finish it in 15 days. In how many days can they finish it working together?

A's 1 day's work $= \frac{1}{35}$
B's 1 day's work $= \frac{1}{15}$
$\therefore$ (A + B)'s 1 day's work $= \frac{1}{35} + \frac{1}{15} = \frac{3+7}{105} = \frac{10}{105} = \frac{2}{21}$
$\therefore$ Both together can finish the work in $\frac{21}{2}$ days $= 10\frac{1}{2}$ days

Ans: (B) $10\frac{1}{2}$ days

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4. A and B together can finish a piece of work in 28 days. A alone can do it in 77 days. In how many days can B alone do it?

(A + B)'s 1 day's work $= \frac{1}{28}$
A's 1 day's work $= \frac{1}{77}$
$\Rightarrow$ B's 1 day's work $= \frac{1}{28} - \frac{1}{77} = \frac{11-4}{308} = \frac{7}{308} = \frac{1}{44}$
$\therefore$ B alone can finish the work in 44 days.

Ans: (A) 44 days

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5. A, B and C together can finish a piece of work in 24 days. B and C together can finish it in 60 days. In how many days can A alone finish it?

(A + B + C)'s 1 day's work $= \frac{1}{24}$
(B + C)'s 1 day's work $= \frac{1}{60}$
A's 1 day's work $=$ (A + B + C)'s 1 day's work $-$ (B + C)'s 1 day's work
$= \frac{1}{24} - \frac{1}{60} = \frac{5-2}{120} = \frac{3}{120} = \frac{1}{40}$
$\therefore$ A alone can finish the work in 40 days

Ans: (D) 40 days

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6. A can do a piece of work in 36 days and B can finish it in 18 days. They work together for 7 days and then B goes away. In how many days will A finish the remaining work?

A's 1 day's work $= \frac{1}{36}$
B's 1 day's work $= \frac{1}{18}$
(A + B)'s 1 day's work $= \frac{1}{36} + \frac{1}{18} = \frac{1+2}{36} = \frac{3}{36} = \frac{1}{12}$
(A + B)'s 7 days' work $= 7 \times \frac{1}{12} = \frac{7}{12}$
Remaining work $= 1 - \frac{7}{12} = \frac{5}{12}$
This work is done by A in $\frac{5}{12} \times 36 = 15$ days

Ans: (B) 15 days

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7. A can do a piece of work in 40 days and B in 12 days. They work together for 5 days. The rest of the work is finished by C in 4 days. If they get ₹960 for the whole work, what is C's daily wage?

A's 1 day's work $= \frac{1}{40}$, B's 1 day's work $= \frac{1}{12}$
(A + B)'s 1 day's work $= \frac{1}{40} + \frac{1}{12} = \frac{3+10}{120} = \frac{13}{120}$
(A + B)'s 5 days' work $= \frac{13}{24}$
Remaining work $= 1 - \frac{13}{24} = \frac{11}{24}$, done by C in 4 days
A's 5 days' work $= \frac{5}{40} = \frac{1}{8}$, B's 5 days' work $= \frac{5}{12}$, C's 4 days' work $= \frac{11}{24}$
Consider $\frac{1}{8} : \frac{5}{12} : \frac{11}{24} = 3 : 10 : 11$
A's share $= 3 \times \frac{960}{24} = 120$, i.e. ₹120
B's share $= 10 \times \frac{960}{24} = 400$, i.e. ₹400
C's share $= 11 \times \frac{960}{24} = 440$, i.e. ₹440
C's daily wage $= \frac{440}{4} = 110$, i.e. ₹110

Ans: (D) ₹110

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8. A is thrice as good a workman as B and is therefore able to finish a piece of work in 20 days less than B. How many days does A take to finish it alone?

Suppose B finishes the work in x days
⇒ A is able to finish it in $(x - 20)$ days
Time taken by A $= \frac{1}{3}$ (Time taken by B)
$\therefore x - 20 = \frac{1}{3}x$
$\Rightarrow 3x - 60 = x \Rightarrow 2x = 60 \Rightarrow x = 30$
$\therefore$ Time taken by B $= 30$ days, time taken by A $= 10$ days

Ans: (A) 10 days

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9. A can do a piece of work in 32 days, B in 24 days and C in 16 days. All begin together, but A leaves the work after 4 days and B leaves 4 days before the work is finished. How long did the work last?

A's 1 day's work $= \frac{1}{32}$, B's $= \frac{1}{24}$, C's $= \frac{1}{16}$
A, B, C together work for 4 days; C alone works for the last 4 days; B and C work together in between.
(A + B + C)'s 1 day's work $= \frac{1}{32} + \frac{1}{24} + \frac{1}{16} = \frac{3+4+6}{96} = \frac{13}{96}$
(A + B + C)'s 4 days' work $= 4 \times \frac{13}{96} = \frac{13}{24}$
C's 4 days' work $= 4 \times \frac{1}{16} = \frac{1}{4}$
Remaining work $= 1 - \left(\frac{13}{24} + \frac{1}{4}\right) = \frac{5}{24}$
(B + C)'s 1 day's work $= \frac{1}{24} + \frac{1}{16} = \frac{2+3}{48} = \frac{5}{48}$
Remaining work is done by (B + C) in $\frac{5}{24} \div \frac{5}{48} = 2$ days
Total time $= 4 + 2 + 4 = 10$ days

Ans: (A) 10 days

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10. A can do a piece of work in 56 days and B can do it in 160 days. They work together for 12 days. Then B leaves and A alone continues the work. 17 days after that, C joins A and the work is completed in 6 days more. In how many days can C do the work alone?

A's 1 day's work $= \frac{1}{56}$, B's 1 day's work $= \frac{1}{160}$
(A + B)'s 1 day's work $= \frac{1}{56} + \frac{1}{160} = \frac{20+7}{1120} = \frac{27}{1120}$
(A + B)'s 12 days' work $= 12 \times \frac{27}{1120} = \frac{81}{280}$
A's 17 days' work $= \frac{17}{56}$
(A + C)'s 6 days' work $= 1 - \left(\frac{81}{280} + \frac{17}{56}\right) = \frac{57}{140}$
$\Rightarrow$ (A + C)'s 1 day's work $= \frac{57}{140} \div 6 = \frac{19}{280}$
C's 1 day's work $= \frac{19}{280} - \frac{1}{56} = \frac{19-5}{280} = \frac{14}{280} = \frac{1}{20}$
C can finish the work in 20 days

Ans: (B) 20 days

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11. A and B together can do a piece of work in 27 days. B and C together can do it in 36 days. If A is twice as good a workman as C, A alone can do it in

(A + B)'s 1 day's work $= \frac{1}{27}$, (B + C)'s 1 day's work $= \frac{1}{36}$
A's 1 day's work $=$ C's 2 days' work
C's 2 days' work + B's 1 day's work $= \frac{1}{27}$
$\Rightarrow$ C's 1 day's work + (B + C)'s 1 day's work $= \frac{1}{27}$
$\Rightarrow$ C's 1 day's work $+ \frac{1}{36} = \frac{1}{27}$
C's 1 day's work $= \frac{1}{27} - \frac{1}{36} = \frac{4-3}{108} = \frac{1}{108}$
A's 1 day's work $= 2 \times \frac{1}{108} = \frac{1}{54}$, so A alone takes 54 days

Ans: (B) 54 days

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12. A and B working alone can finish a piece of work in 16 and 4 days respectively. If they work at it alternately for a day, B beginning, in how many days will the work be finished?

A's 1 day's work $= \frac{1}{16}$, B's 1 day's work $= \frac{1}{4}$
Work done in the first 2 days $= \frac{1}{4} + \frac{1}{16} = \frac{4+1}{16} = \frac{5}{16}$
Work done in the first 6 days $= 3 \times \frac{5}{16} = \frac{15}{16}$
Remaining work $= 1 - \frac{15}{16} = \frac{1}{16}$
On day 7 it is B's turn; B does $\frac{1}{16}$ in $\frac{1}{16} \div \frac{1}{4} = \frac{1}{4}$ day
$\therefore$ Total no. of days $= 6 + \frac{1}{4} = 6\frac{1}{4}$ days

Ans: (C) $6\frac{1}{4}$ days

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13. A certain number of men complete a piece of work in 52 days. If there were 12 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
No. of men $\propto \frac{1}{\text{No. of days}}$
$x \times 52 = (x + 12) \times 28$
$52x = 28x + 336$
$24x = 336 \Rightarrow x = 14$

Ans: (C) 14

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14. If 2 men or 6 boys can finish a piece of work in 11 days, in how many days can 3 men and 2 boys finish it?

2 men $= 6$ boys
3 men $= \frac{6}{2} \times 3 = 9$ boys
3 men + 2 boys $= 9$ boys + 2 boys $= 11$ boys
No. of boys $\propto \frac{1}{\text{No. of days}}$
$6 \times 11 = 11 \times x \Rightarrow x = 6$ days

Ans: (D) 6 days

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15. 6 men and 6 women working 5 hours a day finish a piece of work in 8 days; 8 men and 6 women working 7 hours a day do the same work in 5 days. Find the number of days in which the work is done by 8 men only, working 5 hours a day.

Let 1 man do m and 1 woman do w units of work in 1 hour.
Case (i): $(6m + 6w) \times 5 \times 8 = 240m + 240w$
Case (ii): $(8m + 6w) \times 7 \times 5 = 280m + 210w$
Same work: $240m + 240w = 280m + 210w$
$\Rightarrow 30w = 40m \Rightarrow 3w = 4m$
So 6 women $= 8$ men, and $6m + 6w = 14$ men
14 men working 5 hours a day for 8 days do the same work as 8 men working 5 hours a day for x days
$14 \times 5 \times 8 = 8 \times 5 \times x \Rightarrow x = 14$ days

Ans: (A) 14 days

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16. If 3 men with 2 boys can earn ₹2240 in 7 days and 6 men with 7 boys can earn ₹8360 in 11 days, in what time will 4 men with 3 boys earn ₹5280?

Let 1 man earn ₹x and 1 boy earn ₹y in 1 day.
$(3x + 2y) \times 7 = 2240 \Rightarrow 3x + 2y = 320 \quad \cdots(1)$
$(6x + 7y) \times 11 = 8360 \Rightarrow 6x + 7y = 760 \quad \cdots(2)$
(1) $\times 2 \Rightarrow 6x + 4y = 640$
(2) $-$ (1) $\times 2 \Rightarrow 3y = 120 \Rightarrow y = 40$
From (1): $3x = 320 - 80 = 240 \Rightarrow x = 80$
$(4x + 3y)n = 5280$
$\Rightarrow (320 + 120)n = 5280 \Rightarrow 440n = 5280$
$\Rightarrow n = 12$ days

Ans: (B) 12 days

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17. 40 men are employed to do a piece of work which they could finish in 18 days, but the men drop off by 5 at the end of every 6 days. In what time will the work be completed?

Work done by 40 men in 6 days $= 6 \times \frac{1}{18} = \frac{1}{3}$
So 1 man's work in 6 days $= \frac{1}{3} \div 40 = \frac{1}{120}$
Remaining work $= \frac{2}{3}$, remaining men $= 35$; work done by 35 men in 6 days $= 35 \times \frac{1}{120} = \frac{7}{24}$
Remaining work $= \frac{3}{8}$, remaining men $= 30$; work done by 30 men in 6 days $= 30 \times \frac{1}{120} = \frac{1}{4}$
Remaining work $= \frac{1}{8}$, remaining men $= 25$; work done by 25 men in 6 days $= \frac{5}{24}$
$\frac{1}{8}$ work is done by 25 men in $\frac{1}{8} \div \frac{5}{24} \times 6 = 3\frac{3}{5}$ days
Total time $= 6 + 6 + 6 + 3\frac{3}{5} = 21\frac{3}{5}$ days

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

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18. A can do half as much again as B can do in the same time. B alone can do a piece of work in 30 days. In how many days can A alone finish it?

If B does x, A does $\frac{x}{2} + x = \frac{3x}{2}$ in the same time
Ratio of working of A and B $= \frac{3}{2} : 1 = 3 : 2$
Ratio of time taken for the same work $= 2 : 3$
Time taken by B $= 3k = 30 \Rightarrow k = 10$
Time taken by A $= 2k = 20$ days

Ans: (D) 20 days

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19. The speed of a boat in still water is 10.5 km/hr and the speed of the stream is 0.5 km/hr. The speed of the boat downstream is

Speed downstream $= (x + y)$ km/hr
$= 10.5 + 0.5 = 11$ km/hr

Ans: (C) 11 km/hr

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20. A man can row downstream at the rate of 9 km/hr and upstream at 3 km/hr. The man's rate in still water is

Given $x + y = 9$ and $x - y = 3$
Adding, $2x = 12 \Rightarrow x = 6$ km/hr

Ans: (D) 6 km/hr

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21. A man rows upstream 32 km and downstream 62 km, taking 4 hours each time. The man's speed in still water is

Speed downstream: $x + y = \frac{62}{4}$ km/hr
Speed upstream: $x - y = \frac{32}{4}$ km/hr
Adding, $2x = \frac{62}{4} + \frac{32}{4} = \frac{94}{4}$
$x = \frac{94}{8} = 11.75$ km/hr

Ans: (D) 11.75 km/hr

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22. The rate of a stream is 3.5 km/hr. A man finds that it takes him twice as long to row up the river as to row down. The man's rate in still water is

Let the man's rate in still water be x km/hr
Same distance, twice the time, so speed down $= 2\times$ speed up
Given $2(x - 3.5) = x + 3.5$
$\Rightarrow 2x - 7 = x + 3.5 \Rightarrow x = 10.5$ km/hr

Ans: (B) 10.5 km/hr

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23. A man can row 20 km/hr in still water. If the river is running at 4 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
Speed downstream $= 20 + 4 = 24$ km/hr
Speed upstream $= 20 - 4 = 16$ km/hr
Total time $= 1$ hour 30 minutes $= 1.5$ hours
Time $= \frac{\text{Distance}}{\text{Speed}}$, so $\frac{d}{24} + \frac{d}{16} = 1.5$
$\Rightarrow d\left(\frac{1}{24} + \frac{1}{16}\right) = 1.5$
$\Rightarrow d \times \frac{5}{48} = 1.5$
$\Rightarrow d = 14.4$ km

Ans: (C) 14.4 km

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24. The current of a stream runs at the rate of 5 km/hr. A motor boat goes 14 km upstream and back again to the starting point in 1 hour 35 minutes. The speed of the motor boat in still water is

Let the speed of the boat in still water be x km/hr
Speed upstream $= (x - 5)$ km/hr, speed downstream $= (x + 5)$ km/hr
Total time $= 95$ min $= \frac{95}{60}$ hr $= \frac{19}{12}$ hr
$\frac{14}{x-5} + \frac{14}{x+5} = \frac{19}{12}$
$\Rightarrow 14\left(\frac{(x+5)+(x-5)}{(x-5)(x+5)}\right) = \frac{19}{12}$
$\Rightarrow \frac{28x}{x^2-25} = \frac{19}{12}$
$\Rightarrow 336x = 19x^2 - 475$
$\Rightarrow 19x^2 - 336x - 475 = 0$
$\Rightarrow (x - 19)(19x + 25) = 0$
$\Rightarrow x = 19$ (or) $x = -\frac{25}{19}$ (rejected, a speed cannot be negative)
$\therefore$ Speed of the boat in still water $= 19$ km/hr

Ans: (C) 19 km/hr

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25. A man can row 6 km upstream and 64 km downstream in 5 hours, while he can row 30 km upstream and 16 km downstream in 6 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 $p = \frac{1}{x-y}$, $q = \frac{1}{x+y}$

$\frac{6}{x-y} + \frac{64}{x+y} = 5 \Rightarrow 6p + 64q = 5 \quad \cdots(1)$

$\frac{30}{x-y} + \frac{16}{x+y} = 6 \Rightarrow 30p + 16q = 6 \quad \cdots(2)$

(1) $\times 5 \Rightarrow 30p + 320q = 25$

(1) $\times 5$ − (2) $\Rightarrow 304q = 19 \Rightarrow q = \frac{1}{16}$

From (1): $6p + 4 = 5 \Rightarrow 6p = 1 \Rightarrow p = \frac{1}{6}$

So $x - y = 6$ and $x + y = 16$

Adding, $2x = 22 \Rightarrow x = 11$; then $y = 16 - 11 = 5$

Ans: (A) 5 km/hr