EXPRESSWALA ACADEMY

Arithmetic (Level 2)

MCQ Test, Set 07

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 21 days. What part of the work does A finish in 12 days?

A. $\frac{3}{7}$ **B.** $\frac{7}{4}$ **C.** $\frac{4}{7}$ **D.** $\frac{1}{21}$

2. 20 men can do a piece of work in 15 days. How many men are needed to finish it in 30 days?

A. 10 men **B.** 35 men **C.** 40 men **D.** 5 men

3. A can do a piece of work in 9 days and B alone can do it in 45 days. How much time will both take to finish the work?

A. 54 days **B.** 27 days **C.** $7\frac{1}{2}$ days **D.** 36 days

4. A and B together can do a piece of work in 8 days. B alone can finish it in 12 days. In how many days can A alone finish the work?

A. 24 days **B.** 10 days **C.** 4 days **D.** $4\frac{4}{5}$ days

5. A and B can do a piece of work in 30 days; B and C in 55 days; C and A in 22 days. In how many days will they finish it working together?

A. $20\frac{5}{8}$ days **B.** $35\frac{2}{3}$ days **C.** $41\frac{1}{4}$ days **D.** 107 days

6. A can do a piece of work in 30 days and B can finish it in 25 days. They work together for 12 days and then A goes away. In how many days will B finish the remaining work?

A. 13 days **B.** $3\frac{3}{5}$ days **C.** 3 days **D.** $23\frac{1}{6}$ days

7. A can do a piece of work in 15 days while B alone can do it in 45 days. With the help of C they can finish it in 3 days. If they are paid ₹3600 for the whole work, what is C's share?

A. ₹2640 **B.** ₹1200 **C.** ₹720 **D.** ₹240

8. A is thrice as good a workman as B and is therefore able to finish a piece of work in 28 days less than B. In how many days can they do it working together?

A. $10\frac{1}{2}$ days **B.** 42 days **C.** 28 days **D.** 14 days

9. A and B can do a piece of work in 65 and 60 days respectively. They began the work together, but A leaves after some days and B finishes the remaining work in 35 days. After how many days did A leave?

A. $27\frac{1}{12}$ days **B.** 48 days **C.** 25 days **D.** 13 days

10. A can do a piece of work in 55 days and B can do it in 36 days. They work together for 12 days. Then B leaves and A alone continues the work. 2 days after that, C joins A and the work is completed in 16 days more. In how many days can C do the work alone?

A. 132 days **B.** 264 days **C.** 116 days **D.** 187 days

11. A and B together can do a piece of work in 42 days. B and C together can do it in 48 days. If A is twice as good a workman as C, A alone can do it in

A. 336 days **B.** 168 days **C.** 56 days **D.** 672 days

12. A and B working alone can finish a piece of work in 10 and 11 days respectively. If they work at it alternately for a day, B beginning, in how many days will the work be finished?

A. 10 days **B.** 11 days **C.** $11\frac{1}{2}$ days **D.** $10\frac{1}{2}$ days

13. A certain number of men complete a piece of work in 27 days. If there were 21 men more, the work could be finished in 9 days less. How many men were there originally?

A. 84 **B.** 42 **C.** 21 **D.** 63

14. If 4 men or 8 boys can finish a piece of work in 22 days, in how many days can 6 men and 10 boys finish it?

A. $60\frac{1}{2}$ days **B.** $5\frac{1}{2}$ days **C.** 8 days **D.** 11 days

15. 3 men and 6 women working 10 hours a day finish a piece of work in 7 days; 2 men and 6 women working 7 hours a day do the same work in 11 days. Find the number of days in which the work is done by 10 men only, working 7 hours a day.

A. $7\frac{7}{10}$ days **B.** $7\frac{1}{2}$ days **C.** 11 days **D.** 9 days

16. If 5 men with 8 boys can earn ₹3210 in 6 days and 10 men with 9 boys can earn ₹4650 in 5 days, how much does 1 man earn in a day?

A. ₹107 **B.** ₹75 **C.** ₹20 **D.** ₹95

17. 42 men are employed to do a piece of work which they could finish in 33 days, but the men drop off by 6 at the end of every 11 days. In what time will the work be completed?

A. 33 days **B.** $38\frac{1}{2}$ days **C.** 44 days **D.** $41\frac{1}{4}$ days

18. A can do half as much again as B can do in the same time. A alone can do a piece of work in 58 days. In how many days can B alone finish it?

A. 87 days **B.** $38\frac{2}{3}$ days **C.** 116 days **D.** 29 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 22 days. In how many days can both together finish it?

A. $27\frac{1}{2}$ days **B.** $13\frac{1}{5}$ days **C.** $16\frac{1}{2}$ days **D.** $19\frac{4}{5}$ days

20. A man can row downstream at the rate of 14 km/hr and upstream at 7 km/hr. The man's rate in still water is

A. 7 km/hr **B.** 10.5 km/hr **C.** 3.5 km/hr **D.** 21 km/hr

21. A man rows upstream 36 km and downstream 79 km, taking 5 hours each time. The velocity of the current is

A. 11.5 km/hr **B.** 8.6 km/hr **C.** 9.6 km/hr **D.** 4.3 km/hr

22. A man can row 7.5 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. 3.75 km/hr **B.** 5 km/hr **C.** 5.5 km/hr **D.** 2.5 km/hr

23. A man can row 9 km/hr in still water. If the river is running at 1.5 km/hr, it takes him 2 hours to row to a place and back. The place is at a distance of

A. 9 km **B.** 8.75 km **C.** 15 km **D.** 17.5 km

24. The current of a stream runs at the rate of 4 km/hr. A motor boat goes 20 km upstream and back again to the starting point in 3 hours 45 minutes. The speed of the motor boat in still water is

A. 16 km/hr **B.** 8 km/hr **C.** 12 km/hr **D.** 20 km/hr

25. A man can row 5 km upstream and 18 km downstream in 3 hours, while he can row 10 km upstream and 45 km downstream in 7 hours. The rate of the current is

A. 7 km/hr **B.** 5 km/hr **C.** 4 km/hr **D.** 2 km/hr

Key sheet

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

Solutions

1. A can finish a piece of work in 21 days. What part of the work does A finish in 12 days?

A's 1 day's work $= \frac{1}{21}$

A's 12 days' work $= 12 \times \frac{1}{21} = \frac{12}{21} = \frac{4}{7}$

Ans: (C) $\frac{4}{7}$

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2. 20 men can do a piece of work in 15 days. How many men are needed to finish it in 30 days?

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

$20 \times 15 = x \times 30$

$x = \frac{20 \times 15}{30} = 10$ men

Ans: (A) 10 **men**

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3. A can do a piece of work in 9 days and B alone can do it in 45 days. How much time will both take to finish the work?

A's 1 day's work $= \frac{1}{9}$

B's 1 day's work $= \frac{1}{45}$

$\therefore$ (A + B)'s 1 day's work $= \frac{1}{9} + \frac{1}{45} = \frac{5+1}{45} = \frac{6}{45} = \frac{2}{15}$

$\therefore$ Both together can finish the work in $\frac{15}{2}$ days $= 7\frac{1}{2}$ days

Ans: (C) $7\frac{1}{2}$ **days**

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4. A and B together can do a piece of work in 8 days. B alone can finish it in 12 days. In how many days can A alone finish the work?

(A + B)'s 1 day's work $= \frac{1}{8}$

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

$\Rightarrow$ A's 1 day's work $= \frac{1}{8} - \frac{1}{12} = \frac{3-2}{24} = \frac{1}{24}$

$\therefore$ A alone can finish the work in 24 days.

Ans: (A) 24 **days**

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5. A and B can do a piece of work in 30 days; B and C in 55 days; C and A in 22 days. In how many days will they finish it working together?

(A + B)'s 1 day's work $= \frac{1}{30}$

(B + C)'s 1 day's work $= \frac{1}{55}$

(C + A)'s 1 day's work $= \frac{1}{22}$

Adding, 2(A + B + C)'s 1 day's work $= \frac{1}{30} + \frac{1}{55} + \frac{1}{22} = \frac{11+6+15}{330} = \frac{32}{330} = \frac{16}{165}$

$\Rightarrow$ (A + B + C)'s 1 day's work $= \frac{8}{165}$

$\therefore$ A, B, C together can finish the work in $20\frac{5}{8}$ days.

Ans: (A) $20\frac{5}{8}$ **days**

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6. A can do a piece of work in 30 days and B can finish it in 25 days. They work together for 12 days and then A goes away. In how many days will B finish the remaining work?

A's 1 day's work $= \frac{1}{30}$
B's 1 day's work $= \frac{1}{25}$
(A + B)'s 1 day's work $= \frac{1}{30} + \frac{1}{25} = \frac{5+6}{150} = \frac{11}{150}$
(A + B)'s 12 days' work $= 12 \times \frac{11}{150} = \frac{22}{25}$
Remaining work $= 1 - \frac{22}{25} = \frac{3}{25}$
This work is done by B in $\frac{3}{25} \times 25 = 3$ days

Ans: (C) 3 days

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7. A can do a piece of work in 15 days while B alone can do it in 45 days. With the help of C they can finish it in 3 days. If they are paid ₹3600 for the whole work, what is C's share?

A's 1 day's work $= \frac{1}{15}$
B's 1 day's work $= \frac{1}{45}$
(A + B)'s 1 day's work $= \frac{1}{15} + \frac{1}{45} = \frac{3+1}{45} = \frac{4}{45}$
Given (A + B + C)'s 1 day's work $= \frac{1}{3}$
C's 1 day's work $= \frac{1}{3} - \frac{4}{45} = \frac{15-4}{45} = \frac{11}{45}$
Consider $\frac{1}{15} : \frac{1}{45} : \frac{11}{45} = \frac{3}{45} : \frac{1}{45} : \frac{11}{45} = 3 : 1 : 11$
$\therefore$ ₹3600 must be divided in the ratio $3 : 1 : 11$ $(3 + 1 + 11 = 15)$
C's share $= 3600 \times \frac{11}{15} = 2640$, i.e. ₹2640

Ans: (A) ₹2640

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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 28 days less than B. In how many days can they do it working together?

Suppose B finishes the work in x days
$\Rightarrow$ A is able to finish it in $(x - 28)$ days
Time taken by A $= \frac{1}{3}$ (Time taken by B)
$\therefore x - 28 = \frac{1}{3}x$
$\Rightarrow 3x - 84 = x \Rightarrow 2x = 84 \Rightarrow x = 42$
$\therefore$ Time taken by B $= 42$ days, time taken by A $= 14$ days
A's 1 day's work $= \frac{1}{14}$, B's 1 day's work $= \frac{1}{42}$
(A + B)'s 1 day's work $= \frac{1}{14} + \frac{1}{42} = \frac{3+1}{42} = \frac{4}{42} = \frac{2}{21}$
A and B together can finish the work in $10\frac{1}{2}$ days

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

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9. A and B can do a piece of work in 65 and 60 days respectively. They began the work together, but A leaves after some days and B finishes the remaining work in 35 days. After how many days did A leave?

A's 1 day's work $= \frac{1}{65}$, B's 1 day's work $= \frac{1}{60}$
(A + B)'s 1 day's work $= \frac{1}{65} + \frac{1}{60} = \frac{12+13}{780} = \frac{25}{780} = \frac{5}{156}$
B's 35 days' work $= 35 \times \frac{1}{60} = \frac{7}{12}$
Remaining work $= 1 - \frac{7}{12} = \frac{5}{12}$
(A + B)'s x days' work $= \frac{5}{12} \Rightarrow \frac{5}{156} \times x = \frac{5}{12}$
$x = 13$, so A left after 13 days

Ans: (D) 13 days

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10. A can do a piece of work in 55 days and B can do it in 36 days. They work together for 12 days. Then B leaves and A alone continues the work. 2 days after that, C joins A and the work is completed in 16 days more. In how many days can C do the work alone?

A's 1 day's work $= \frac{1}{55}$, B's 1 day's work $= \frac{1}{36}$
(A + B)'s 1 day's work $= \frac{1}{55} + \frac{1}{36} = \frac{36+55}{1980} = \frac{91}{1980}$
(A + B)'s 12 days' work $= 12 \times \frac{91}{1980} = \frac{91}{165}$
A's 2 days' work $= \frac{2}{55}$
(A + C)'s 16 days' work $= 1 - \left(\frac{91}{165} + \frac{2}{55}\right) = \frac{68}{165}$
$\Rightarrow$ (A + C)'s 1 day's work $= \frac{68}{165} \div 16 = \frac{17}{660}$
C's 1 day's work $= \frac{17}{660} - \frac{1}{55} = \frac{17-12}{660} = \frac{5}{660} = \frac{1}{132}$
C can finish the work in 132 days

Ans: (A) 132 days

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11. A and B together can do a piece of work in 42 days. B and C together can do it in 48 days. If A is twice as good a workman as C, A alone can do it in

(A + B)'s 1 day's work $= \frac{1}{42}$, (B + C)'s 1 day's work $= \frac{1}{48}$
A's 1 day's work $=$ C's 2 days' work
C's 2 days' work + B's 1 day's work $= \frac{1}{42}$
$\Rightarrow$ C's 1 day's work + (B + C)'s 1 day's work $= \frac{1}{42}$
$\Rightarrow$ C's 1 day's work $+ \frac{1}{48} = \frac{1}{42}$
C's 1 day's work $= \frac{1}{42} - \frac{1}{48} = \frac{8-7}{336} = \frac{1}{336}$
A's 1 day's work $= 2 \times \frac{1}{336} = \frac{1}{168}$, so A alone takes 168 days

Ans: (B) 168 days

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12. A and B working alone can finish a piece of work in 10 and 11 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 $= \frac{1}{10}$, B's 1 day's work $= \frac{1}{11}$
Work done in the first 2 days $= \frac{1}{11} + \frac{1}{10} = \frac{10+11}{110} = \frac{21}{110}$
Work done in the first 10 days $= 5 \times \frac{21}{110} = \frac{21}{22}$
Remaining work $= 1 - \frac{21}{22} = \frac{1}{22}$
On day 11 it is B's turn; B does $\frac{1}{22}$ in $\frac{1}{22} \div \frac{1}{11} = \frac{1}{2}$ day
$\therefore$ Total no. of days $= 10 + \frac{1}{2} = 10\frac{1}{2}$ days

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

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13. A certain number of men complete a piece of work in 27 days. If there were 21 men more, the work could be finished in 9 days less. How many men were there originally?

Let the original number of men be x

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

$x \times 27 = (x + 21) \times 18$

$27x = 18x + 378$

$9x = 378 \Rightarrow x = 42$

Ans: (B) 42

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14. If 4 men or 8 boys can finish a piece of work in 22 days, in how many days can 6 men and 10 boys finish it?

4 men $= 8$ boys

6 men $= \frac{8}{4} \times 6 = 12$ boys

6 men + 10 boys $= 12$ boys + 10 boys $= 22$ boys

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

$8 \times 22 = 22 \times x \Rightarrow x = 8$ days

Ans: (C) 8 **days**

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15. 3 men and 6 women working 10 hours a day finish a piece of work in 7 days; 2 men and 6 women working 7 hours a day do the same work in 11 days. Find the number of days in which the work is done by 10 men only, working 7 hours a day.

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

Case (i): $(3m + 6w) \times 10 \times 7 = 210m + 420w$

Case (ii): $(2m + 6w) \times 7 \times 11 = 154m + 462w$

Same work: $210m + 420w = 154m + 462w$

$\Rightarrow 42w = 56m \Rightarrow 3w = 4m$

So 6 women $= 8$ men, and $3m + 6w = 11$ men

11 men working 10 hours a day for 7 days do the same work as 10 men working 7 hours a day for x days

$11 \times 10 \times 7 = 10 \times 7 \times x \Rightarrow x = 11$ days

Ans: (C) 11 **days**

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16. If 5 men with 8 boys can earn ₹3210 in 6 days and 10 men with 9 boys can earn ₹4650 in 5 days, how much does 1 man earn in a day?

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

$(5x + 8y) \times 6 = 3210 \Rightarrow 5x + 8y = 535 \quad \cdots (1)$

$(10x + 9y) \times 5 = 4650 \Rightarrow 10x + 9y = 930 \quad \cdots (2)$

(1) $\times 2 \Rightarrow 10x + 16y = 1070$

(1) $\times 2$ − (2) $\Rightarrow 7y = 140 \Rightarrow y = 20$

From (1): $5x = 535 - 160 = 375 \Rightarrow x = 75$

Ans: (B) ₹75

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17. 42 men are employed to do a piece of work which they could finish in 33 days, but the men drop off by 6 at the end of every 11 days. In what time will the work be completed?

Work done by 42 men in 11 days $= 11 \times \frac{1}{33} = \frac{1}{3}$
So 1 man's work in 11 days $= \frac{1}{3} \div 42 = \frac{1}{126}$
Remaining work $= \frac{2}{3}$, remaining men $= 36$; work done by 36 men in 11 days $= 36 \times \frac{1}{126} = \frac{2}{7}$
Remaining work $= \frac{8}{21}$, remaining men $= 30$; work done by 30 men in 11 days $= 30 \times \frac{1}{126} = \frac{5}{21}$
Remaining work $= \frac{1}{7}$, remaining men $= 24$; work done by 24 men in 11 days $= \frac{4}{21}$
$\frac{1}{7}$ work is done by 24 men in $\frac{1}{7} \div \frac{4}{21} \times 11 = 8\frac{1}{4}$ days
Total time $= 11 + 11 + 11 + 8\frac{1}{4} = 41\frac{1}{4}$ days

Ans: (D) $41\frac{1}{4}$ days

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18. A can do half as much again as B can do in the same time. A alone can do a piece of work in 58 days. In how many days can B 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 A $= 2k = 58 \Rightarrow k = 29$
Time taken by B $= 3k = 87$ days

Ans: (A) 87 days

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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 22 days. In how many days can both together 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 A $= 2k = 22 \Rightarrow k = 11$
Time taken by B $= 3k = 33$ days
A's 1 day's work $= \frac{1}{22}$, B's 1 day's work $= \frac{1}{33}$
(A + B)'s 1 day's work $= \frac{1}{22} + \frac{1}{33} = \frac{3+2}{66} = \frac{5}{66}$
Time taken by (A + B) to finish the work $= 13\frac{1}{5}$ days

Ans: (B) $13\frac{1}{5}$ days

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20. A man can row downstream at the rate of 14 km/hr and upstream at 7 km/hr. The man's rate in still water is

Given $x + y = 14$ and $x - y = 7$
Adding, $2x = 21 \Rightarrow x = 10.5$ km/hr

Ans: (B) 10.5 km/hr

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21. A man rows upstream 36 km and downstream 79 km, taking 5 hours each time. The velocity of the current is

Speed downstream: $x + y = \frac{79}{5}$ km/hr
Speed upstream: $x - y = \frac{36}{5}$ km/hr
Subtracting, $2y = \frac{79}{5} - \frac{36}{5} = \frac{43}{5}$
$y = \frac{43}{10} = 4.3$ km/hr

Ans: (D) 4.3 km/hr

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22. A man can row 7.5 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
Given $2(7.5 - y) = 7.5 + y$
$\Rightarrow 15 - 2y = 7.5 + y \Rightarrow 3y = 7.5$
$\Rightarrow y = 2.5$ km/hr

Ans: (D) 2.5 km/hr

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23. A man can row 9 km/hr in still water. If the river is running at 1.5 km/hr, it takes him 2 hours to row to a place and back. The place is at a distance of

Let the required distance be d km
Speed downstream $= 9 + 1.5 = 10.5$ km/hr
Speed upstream $= 9 - 1.5 = 7.5$ km/hr
Time $= \frac{\text{Distance}}{\text{Speed}}$, so $\frac{d}{10.5} + \frac{d}{7.5} = 2$
$\Rightarrow d\left(\frac{2}{21} + \frac{2}{15}\right) = 2$
$\Rightarrow d \times \frac{8}{35} = 2$
$\Rightarrow d = 8.75$ km

Ans: (B) 8.75 km

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24. The current of a stream runs at the rate of 4 km/hr. A motor boat goes 20 km upstream and back again to the starting point in 3 hours 45 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 $= (x - 4)$ km/hr, speed downstream $= (x + 4)$ km/hr
Total time $= 225$ min $= \frac{225}{60}$ hr $= \frac{15}{4}$ hr
$\frac{20}{x-4} + \frac{20}{x+4} = \frac{15}{4}$
$\Rightarrow 20\left(\frac{(x+4)+(x-4)}{(x-4)(x+4)}\right) = \frac{15}{4}$
$\Rightarrow \frac{40x}{x^2-16} = \frac{15}{4}$
$\Rightarrow 160x = 15x^2 - 240$
$\Rightarrow 3x^2 - 32x - 48 = 0$
$\Rightarrow (x - 12)(3x + 4) = 0$
$\Rightarrow x = 12$ (or) $x = -\frac{4}{3}$ (rejected, a speed cannot be negative)
$\therefore$ Speed of the boat in still water $= 12$ km/hr

Ans: (C) 12 km/hr

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25. A man can row 5 km upstream and 18 km downstream in 3 hours, while he can row 10 km upstream and 45 km downstream in 7 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 $p = \frac{1}{x-y}$, $q = \frac{1}{x+y}$
$\frac{5}{x-y} + \frac{18}{x+y} = 3 \Rightarrow 5p + 18q = 3 \quad \cdots(1)$
$\frac{10}{x-y} + \frac{45}{x+y} = 7 \Rightarrow 10p + 45q = 7 \quad \cdots(2)$
(1) $\times 2 \Rightarrow 10p + 36q = 6$
(2) $-$ (1) $\times 2 \Rightarrow 9q = 1 \Rightarrow q = \frac{1}{9}$
From (1): $5p + 2 = 3 \Rightarrow 5p = 1 \Rightarrow p = \frac{1}{5}$
So $x - y = 5$ and $x + y = 9$
Adding, $2x = 14 \Rightarrow x = 7$; then $y = 9 - 7 = 2$

Ans: (D) 2 km/hr