

Arithmetic (Level 2)**MCQ Test, Set 09**

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. If A can finish a piece of work in 9 days, then A's 1 day's work is
A. 9 **B.** $\frac{1}{9}$ **C.** $\frac{1}{8}$ **D.** $\frac{8}{9}$
2. 6 men can finish a piece of work in 40 days. In how many days can 15 men finish the same work?
A. 100 days **B.** 31 days **C.** 49 days **D.** 16 days
3. A can finish a piece of work in 60 days and B can finish it in 12 days. In how many days can they finish it working together?
A. 72 days **B.** 10 days **C.** $\frac{1}{10}$ days **D.** 36 days
4. A and B together can finish a piece of work in 38 days. A alone can do it in 114 days. In how many days can B alone do it?
A. 76 days **B.** 57 days **C.** $28\frac{1}{2}$ days **D.** 152 days
5. A and B can do a piece of work in 70 days; B and C in 84 days; C and A in 60 days. In how many days can A alone finish it?
A. 210 days **B.** 140 days **C.** 105 days **D.** $46\frac{2}{3}$ days
6. A can do a piece of work in 50 days and B can finish it in 16 days. They work together for 8 days and then B goes away. In how many days will A finish the remaining work?
A. 42 days **B.** $45\frac{7}{8}$ days **C.** 17 days **D.** 21 days
7. A can do a piece of work in 22 days while B alone can do it in 44 days. With the help of C they can finish it in 12 days. If they are paid ₹11550 for the whole work, what is B's share?
A. ₹6300 **B.** ₹2100 **C.** ₹3850 **D.** ₹3150
8. A is twice as good a workman as B and is therefore able to finish a piece of work in 30 days less than B. In how many days can they do it working together?
A. 45 days **B.** 30 days **C.** 60 days **D.** 20 days
9. A and B can do a piece of work in 20 and 80 days respectively. They began the work together, but A leaves after some days and B finishes the remaining work in 40 days. After how many days did A leave?
A. 8 days **B.** 48 days **C.** 40 days **D.** 10 days

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21. A man can row 13.5 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. 11.5 km/hr B. 9 km/hr C. 4.5 km/hr D. 6.75 km/hr
-
22. A man can row 14 km/hr in still water and he finds that it takes him thrice as long to row up as to row down the river. The rate of the stream is
- A. 11 km/hr B. 10.5 km/hr C. 7 km/hr D. 3.5 km/hr
-
23. A man can row 9 km/hr in still water. If the river is running at 3 km/hr, it takes him 3 hours to row to a place and back. The place is at a distance of
- A. 18 km B. 13.5 km C. 24 km D. 12 km
-
24. The current of a stream runs at the rate of 4 km/hr. A motor boat goes 36 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. 20 km/hr B. 16 km/hr C. 24 km/hr D. 28 km/hr
-
25. A man can row 8 km upstream and 84 km downstream in 8 hours, while he can row 24 km upstream and 72 km downstream in 9 hours. The speed of the man in still water is
- A. 10 km/hr B. 12 km/hr C. 2 km/hr D. 8 km/hr
-

Key sheet

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

Solutions

1. If A can finish a piece of work in 9 days, then A's 1 day's work is

A finishes the whole work in 9 days.

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

Ans: (B) $\frac{1}{9}$

2. 6 men can finish a piece of work in 40 days. In how many days can 15 men finish the same work?

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

$$6 \times 40 = 15 \times x$$

$$x = \frac{6 \times 40}{15} = 16 \text{ days}$$

Ans: (D) 16 days

3. A can finish a piece of work in 60 days and B can finish it in 12 days. In how many days can they finish it working together?

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

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

$$\therefore (\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{60} + \frac{1}{12} = \frac{1+5}{60} = \frac{6}{60} = \frac{1}{10}$$

$\therefore$ Both together can finish the work in 10 days

Ans: (B) 10 days

4. A and B together can finish a piece of work in 38 days. A alone can do it in 114 days. In how many days can B alone do it?

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{38}$$

$$\text{A's 1 day's work} = \frac{1}{114}$$

$$\Rightarrow \text{B's 1 day's work} = \frac{1}{38} - \frac{1}{114} = \frac{3-1}{114} = \frac{2}{114} = \frac{1}{57}$$

$\therefore$ B alone can finish the work in 57 days.

Ans: (B) 57 days

5. A and B can do a piece of work in 70 days; B and C in 84 days; C and A in 60 days. In how many days can A alone finish it?

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{70}$$

$$(\text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{84}$$

$$(\text{C} + \text{A})\text{'s 1 day's work} = \frac{1}{60}$$

$$\text{Adding, } 2(\text{A} + \text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{70} + \frac{1}{84} + \frac{1}{60} = \frac{6+5+7}{420} = \frac{18}{420} = \frac{3}{70}$$

$$\Rightarrow (\text{A} + \text{B} + \text{C})\text{'s 1 day's work} = \frac{3}{140}$$

$\therefore$ A, B, C together can finish the work in $46\frac{2}{3}$ days.

$$\text{A's 1 day's work} = \frac{3}{140} - \frac{1}{84} = \frac{1}{105}, \text{ so A alone takes 105 days}$$

Ans: (C) 105 days

6. A can do a piece of work in 50 days and B can finish it in 16 days. They work together for 8 days and then B goes away. In how many days will A finish the remaining work?

$$\text{A's 1 day's work} = \frac{1}{50}$$

$$\text{B's 1 day's work} = \frac{1}{16}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{50} + \frac{1}{16} = \frac{8+25}{400} = \frac{33}{400}$$

$$(\text{A} + \text{B})\text{'s 8 days' work} = 8 \times \frac{33}{400} = \frac{33}{50}$$

$$\text{Remaining work} = 1 - \frac{33}{50} = \frac{17}{50}$$

$$\text{This work is done by A in } \frac{17}{50} \times 50 = 17 \text{ days}$$

Ans: (C) 17 days

7. A can do a piece of work in 22 days while B alone can do it in 44 days. With the help of C they can finish it in 12 days. If they are paid ₹11550 for the whole work, what is B's share?

$$\text{A's 1 day's work} = \frac{1}{22}$$

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

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{22} + \frac{1}{44} = \frac{2+1}{44} = \frac{3}{44}$$

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

$$\text{C's 1 day's work} = \frac{1}{12} - \frac{3}{44} = \frac{11-9}{132} = \frac{2}{132} = \frac{1}{66}$$

$$\text{Consider } \frac{1}{22} : \frac{1}{44} : \frac{1}{66} = \frac{6}{132} : \frac{3}{132} : \frac{2}{132} = 6 : 3 : 2$$

∴ ₹11550 must be divided in the ratio 6 : 3 : 2 (6 + 3 + 2 = 11)

$$\text{B's share} = 11550 \times \frac{3}{11} = 3150, \text{ i.e. ₹3150}$$

Ans: (D) ₹3150

8. A is twice as good a workman as B and is therefore able to finish a piece of work in 30 days less than B. In how many days can they do it working together?

Suppose B finishes the work in x days

⇒ A is able to finish it in $(x - 30)$ days

Time taken by A = $\frac{1}{2}$ (Time taken by B)

$$\therefore x - 30 = \frac{1}{2}x$$

$$\Rightarrow 2x - 60 = x \Rightarrow x = 60$$

∴ Time taken by B = 60 days, time taken by A = 30 days

$$\text{A's 1 day's work} = \frac{1}{30}, \text{ B's 1 day's work} = \frac{1}{60}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{30} + \frac{1}{60} = \frac{2+1}{60} = \frac{3}{60} = \frac{1}{20}$$

A and B together can finish the work in 20 days

Ans: (D) 20 days

9. A and B can do a piece of work in 20 and 80 days respectively. They began the work together, but A leaves after some days and B finishes the remaining work in 40 days. After how many days did A leave?

$$\text{A's 1 day's work} = \frac{1}{20}, \text{ B's 1 day's work} = \frac{1}{80}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{20} + \frac{1}{80} = \frac{4+1}{80} = \frac{5}{80} = \frac{1}{16}$$

$$\text{B's 40 days' work} = 40 \times \frac{1}{80} = \frac{1}{2}$$

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

$$(\text{A} + \text{B})\text{'s } x \text{ days' work} = \frac{1}{2} \Rightarrow \frac{1}{16} \times x = \frac{1}{2}$$

$$x = 8, \text{ so A left after 8 days}$$

Ans: (A) 8 days

10. A can do a piece of work in 208 days and B can do it in 130 days. They work together for 10 days. Then B leaves and A alone continues the work. 29 days after that, C joins A and the work is completed in 75 days more. In how many days can C do the work alone?

$$\text{A's 1 day's work} = \frac{1}{208}, \text{ B's 1 day's work} = \frac{1}{130}$$

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{208} + \frac{1}{130} = \frac{5+8}{1040} = \frac{13}{1040} = \frac{1}{80}$$

$$(\text{A} + \text{B})\text{'s 10 days' work} = 10 \times \frac{1}{80} = \frac{1}{8}$$

$$\text{A's 29 days' work} = \frac{29}{208}$$

$$(\text{A} + \text{C})\text{'s 75 days' work} = 1 - \left(\frac{1}{8} + \frac{29}{208}\right) = \frac{153}{208}$$

$$\Rightarrow (\text{A} + \text{C})\text{'s 1 day's work} = \frac{153}{208} \div 75 = \frac{51}{5200}$$

$$\text{C's 1 day's work} = \frac{51}{5200} - \frac{1}{208} = \frac{51-25}{5200} = \frac{26}{5200} = \frac{1}{200}$$

C can finish the work in 200 days

Ans: (A) 200 days

11. A and B together can do a piece of work in 4 days. B and C together can do it in 6 days. If A is twice as good a workman as C, B alone can do it in

$$(\text{A} + \text{B})\text{'s 1 day's work} = \frac{1}{4}, (\text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{6}$$

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

$$\text{C's 2 days' work} + \text{B's 1 day's work} = \frac{1}{4}$$

$$\Rightarrow \text{C's 1 day's work} + (\text{B} + \text{C})\text{'s 1 day's work} = \frac{1}{4}$$

$$\Rightarrow \text{C's 1 day's work} + \frac{1}{6} = \frac{1}{4}$$

$$\text{C's 1 day's work} = \frac{1}{4} - \frac{1}{6} = \frac{3-2}{12} = \frac{1}{12}$$

$$\text{B's 1 day's work} = \frac{1}{6} - \frac{1}{12} = \frac{2-1}{12} = \frac{1}{12}$$

$\therefore$ B alone can finish the work in 12 days

Ans: (D) 12 days

12. A and B working alone can finish a piece of work in 24 and 6 days respectively. If they work at it alternately for a day, A beginning, in how many days will the work be finished?

$$\text{A's 1 day's work} = \frac{1}{24}, \text{ B's 1 day's work} = \frac{1}{6}$$

$$\text{Work done in the first 2 days} = \frac{1}{24} + \frac{1}{6} = \frac{1+4}{24} = \frac{5}{24}$$

$$\text{Work done in the first 8 days} = 4 \times \frac{5}{24} = \frac{5}{6}$$

$$\text{On day 9 it is A's turn: work done in the first 9 days} = \frac{5}{6} + \frac{1}{24} = \frac{7}{8}$$

$$\text{Remaining work} = 1 - \frac{7}{8} = \frac{1}{8}$$

$$\text{B does it in } \frac{1}{8} \div \frac{1}{6} = \frac{3}{4} \text{ day}$$

$$\therefore \text{Total no. of days} = 9 + \frac{3}{4} = 9\frac{3}{4} \text{ days}$$

Ans: (D) $9\frac{3}{4}$ days

13. A certain number of men complete a piece of work in 64 days. If there were 12 men more, the work could be finished in 16 days less. How many men were there originally?

Let the original number of men be x

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

$$x \times 64 = (x + 12) \times 48$$

$$64x = 48x + 576$$

$$16x = 576 \Rightarrow x = 36$$

Ans: (B) 36

14. If 8 men or 12 boys can finish a piece of work in 20 days, in how many days can 2 men and 3 boys finish it?

$$8 \text{ men} = 12 \text{ boys}$$

$$2 \text{ men} = \frac{12}{8} \times 2 = 3 \text{ boys}$$

$$2 \text{ men} + 3 \text{ boys} = 3 \text{ boys} + 3 \text{ boys} = 6 \text{ boys}$$

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

$$12 \times 20 = 6 \times x \Rightarrow x = 40 \text{ days}$$

Ans: (A) 40 days

15. 4 men and 6 women working 8 hours a day finish a piece of work in 5 days; 2 men and 6 women working 7 hours a day do the same work in 8 days. Find the number of days in which the work is done by 7 men only, working 5 hours a day.

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

$$\text{Case (i): } (4m + 6w) \times 8 \times 5 = 160m + 240w$$

$$\text{Case (ii): } (2m + 6w) \times 7 \times 8 = 112m + 336w$$

$$\text{Same work: } 160m + 240w = 112m + 336w$$

$$\Rightarrow 96w = 48m \Rightarrow 2w = m$$

$$\text{So } 6 \text{ women} = 3 \text{ men, and } 4m + 6w = 7 \text{ men}$$

7 men working 8 hours a day for 5 days do the same work as 7 men working 5 hours a day for x days

$$7 \times 8 \times 5 = 7 \times 5 \times x \Rightarrow x = 8 \text{ days}$$

Ans: (C) 8 days

16. If 5 men with 8 boys can earn ₹4455 in 3 days and 10 men with 11 boys can earn ₹14970 in 6 days, in what time will 4 men with 9 boys earn ₹27265?

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

$$(5x + 8y) \times 3 = 4455 \Rightarrow 5x + 8y = 1485 \quad \dots (1)$$

$$(10x + 11y) \times 6 = 14970 \Rightarrow 10x + 11y = 2495 \quad \dots (2)$$

$$(1) \times 2 \Rightarrow 10x + 16y = 2970$$

$$(1) \times 2 - (2) \Rightarrow 5y = 475 \Rightarrow y = 95$$

$$\text{From (1): } 5x = 1485 - 760 = 725 \Rightarrow x = 145$$

$$(4x + 9y)n = 27265$$

$$\Rightarrow (580 + 855)n = 27265 \Rightarrow 1435n = 27265$$

$$\Rightarrow n = 19 \text{ days}$$

Ans: (D) 19 days

17. 40 men are employed to do a piece of work which they could finish in 38 days, but the men drop off by 4 at the end of every 16 days. In what time will the work be completed?

$$\text{Work done by 40 men in 16 days} = 16 \times \frac{1}{38} = \frac{8}{19}$$

$$\text{So 1 man's work in 16 days} = \frac{8}{19} \div 40 = \frac{1}{95}$$

$$\text{Remaining work} = \frac{11}{19}, \text{ remaining men} = 36; \text{ work done by 36 men in 16 days} = 36 \times \frac{1}{95} = \frac{36}{95}$$

$$\text{Remaining work} = \frac{1}{5}, \text{ remaining men} = 32; \text{ work done by 32 men in 16 days} = \frac{32}{95}$$

$$\frac{1}{5} \text{ work is done by 32 men in } \frac{1}{5} \div \frac{32}{95} \times 16 = 9\frac{1}{2} \text{ days}$$

$$\text{Total time} = 16 + 16 + 9\frac{1}{2} = 41\frac{1}{2} \text{ days}$$

Ans: (C) $41\frac{1}{2}$ 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 39 days. In how many days can both together finish it?

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

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

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

$$\text{Time taken by B} = 3k = 39 \Rightarrow k = 13$$

$$\text{Time taken by A} = 2k = 26 \text{ days}$$

$$\text{A's 1 day's work} = \frac{1}{26}, \text{ B's 1 day's work} = \frac{1}{39}$$

$$(A + B)\text{'s 1 day's work} = \frac{1}{26} + \frac{1}{39} = \frac{3+2}{78} = \frac{5}{78}$$

$$\text{Time taken by (A + B) to finish the work} = 15\frac{3}{5} \text{ days}$$

Ans: (B) $15\frac{3}{5}$ days

19. A man can row downstream at the rate of 16 km/hr and upstream at 12 km/hr. The man's rate in still water is

$$\text{Given } x + y = 16 \text{ and } x - y = 12$$

$$\text{Adding, } 2x = 28 \Rightarrow x = 14 \text{ km/hr}$$

Ans: (B) 14 km/hr

20. A man rows upstream 18 km and downstream 23 km, taking 5 hours each time. The velocity of the current is

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

$$\text{Speed upstream: } x - y = \frac{18}{5} \text{ km/hr}$$

$$\text{Subtracting, } 2y = \frac{23}{5} - \frac{18}{5} = \frac{5}{5}$$

$$y = \frac{5}{10} = 0.5 \text{ km/hr}$$

Ans: (A) 0.5 km/hr

21. A man can row 13.5 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

$$\text{Given } 2(13.5 - y) = 13.5 + y$$

$$\Rightarrow 27 - 2y = 13.5 + y \Rightarrow 3y = 13.5$$

$$\Rightarrow y = 4.5 \text{ km/hr}$$

Ans: (C) 4.5 km/hr

22. A man can row 14 km/hr in still water and he finds that it takes him thrice 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, thrice the time, so speed down = $3 \times$ speed up

$$\text{Given } 3(14 - y) = 14 + y$$

$$\Rightarrow 42 - 3y = 14 + y \Rightarrow 4y = 28$$

$$\Rightarrow y = 7 \text{ km/hr}$$

Ans: (C) 7 km/hr

23. A man can row 9 km/hr in still water. If the river is running at 3 km/hr, it takes him 3 hours to row to a place and back. The place is at a distance of

Let the required distance be d km

$$\text{Speed downstream} = 9 + 3 = 12 \text{ km/hr}$$

$$\text{Speed upstream} = 9 - 3 = 6 \text{ km/hr}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}, \text{ so } \frac{d}{12} + \frac{d}{6} = 3$$

$$\Rightarrow d \left(\frac{1}{12} + \frac{1}{6} \right) = 3$$

$$\Rightarrow d \times \frac{1}{4} = 3$$

$$\Rightarrow d = 12 \text{ km}$$

Ans: (D) 12 km

24. The current of a stream runs at the rate of 4 km/hr. A motor boat goes 36 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

$$\frac{36}{x-4} + \frac{36}{x+4} = \frac{15}{4}$$

$$\Rightarrow 36 \left(\frac{(x+4)+(x-4)}{(x-4)(x+4)} \right) = \frac{15}{4}$$

$$\Rightarrow \frac{72x}{x^2-16} = \frac{15}{4}$$

$$\Rightarrow 288x = 15x^2 - 240$$

$$\Rightarrow 5x^2 - 96x - 80 = 0$$

$$\Rightarrow (x - 20)(5x + 4) = 0$$

$$\Rightarrow x = 20 \text{ (or) } x = -\frac{4}{5} \text{ (rejected, a speed cannot be negative)}$$

$\therefore$ Speed of the boat in still water = 20 km/hr

Ans: (A) 20 km/hr

25. A man can row 8 km upstream and 84 km downstream in 8 hours, while he can row 24 km upstream and 72 km downstream in 9 hours. The speed of the man in still water 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 $p = \frac{1}{x-y}$, $q = \frac{1}{x+y}$

$$\frac{8}{x-y} + \frac{84}{x+y} = 8 \Rightarrow 8p + 84q = 8 \quad \dots (1)$$

$$\frac{24}{x-y} + \frac{72}{x+y} = 9 \Rightarrow 24p + 72q = 9 \quad \dots (2)$$

$$(1) \times 3 \Rightarrow 24p + 252q = 24$$

$$(1) \times 3 - (2) \Rightarrow 180q = 15 \Rightarrow q = \frac{1}{12}$$

$$\text{From (1): } 8p + 7 = 8 \Rightarrow 8p = 1 \Rightarrow p = \frac{1}{8}$$

$$\text{So } x - y = 8 \text{ and } x + y = 12$$

$$\text{Adding, } 2x = 20 \Rightarrow x = 10; \text{ then } y = 12 - 10 = 2$$

Ans: (A) 10 km/hr