

Target RBI Grade B 2023

Top 150 Questions

Quant

Most Important

Lecture 5 – Time & Work



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What we have to cover in Time & Work, Pipes & Cistern

- Concept 1 – When timing is given *↗ Work Assume*
- Concept 2 – Comparison between efficiency or time
- Concept 3 – Comparison between work
- Concept 4 – Chain Rule ✓
- Data sufficiency and Data Interpretation on Time & Work



$$\checkmark \text{ Work} = \text{Time} \times \checkmark \text{ Efficiency}$$

↳ Work done in Per unit time

$$\text{Time} = \frac{\text{Work}}{\text{Effy}}$$

$$\text{Effy} = \frac{\text{Work}}{\text{Time}}$$

10 fays → 1 day

10 fays / day



①
Time Given
↓
Work - Amount

✓ A → 10 days ✓	30 unit ✓
✓ B → 15 days ✓	3 unit/day ✓
✓ C → 30 days ✓	2 unit/day ✓
	1 unit/day

$$A+B \rightarrow 3 \text{ days} \rightarrow 5 \times 3 = 15$$

$$C(\text{Remain}) = ?$$

$$30 - 15 = 15$$

$$\frac{15}{1} = 15 \text{ days}$$

$$A+B+C \rightarrow \frac{30}{3+2+1} = \frac{30}{6} = 5 \text{ days}$$

$$(A+B)(70\%) + C(\text{Remain}) = ?$$

$$\frac{21}{3+2} + \frac{9}{1} = 4\frac{1}{5} + 9 = 13\frac{1}{5} \text{ days}$$

$$30 \times 70\% = 21$$

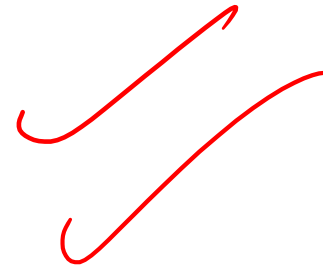


②

Work Constant

$$\text{Time} \propto \frac{1}{\text{Efficiency}}$$

	A	B
Time	$P = Q$	
Effy	$Q = P$	



Q.1) A can do a piece of work in 40 days. He worked at it for 5 days then B finished it in 21 days. In how many days can A, and B together finish the work?

- A) 12 days
- B) 15 days
- C) 18 days
- D) 24 days
- E) 32 days

$$A \rightarrow 40 \text{ days} \quad \left| \begin{array}{l} 40 \text{ unit} \\ \hline 1 \text{ unit/day} \end{array} \right. \checkmark$$

$$A+B \rightarrow \frac{40}{1+\frac{5}{3}} = \frac{40 \cdot 3}{8} = 15 \text{ days}$$

$$A \rightarrow 5 \text{ days} \times 1 = 5 \text{ unit}$$

$$\text{Remaining work} = 40 - 5 = 35 \text{ unit}$$

$$B = \frac{35}{7} = \frac{5}{1} \text{ unit/day} \checkmark$$



Q.2) Aman can do some work in 20 days, Vikas can do it in 40 days and Sudhir can do it in 80 days. They start the working in turns with Aman starting to work on first day. Followed by Vikas on the second day and by the Sudhir on third day and again by Aman on the Fourth Day and so on till the work is completed. Find the time taken to complete the work.

- A) $34\frac{1}{3}$ days
- B) $31\frac{2}{3}$ days
- C) $34\frac{1}{2}$ days
- D) $33\frac{3}{4}$ days
- E) None of these

	(80) unit
Aman → 20 days	4
Vikas → 40 days	2
Sudhir → 80 days	1

$$\begin{array}{r} 7 \overline{) 80} \quad (11) \\ \underline{77} \\ 30 \\ \underline{27} \\ 30 \\ \underline{27} \\ 30 \end{array}$$

I day Aman → 4
 II day Vikas → 2
 III day Sudhir → 1
 IV Aman

3 days → 7 unit ✓
 x 11
 33 days → 77 unit
 34th day → $\frac{3 \text{ unit}}{4}$
 $33 + \frac{3}{4} = 33\frac{3}{4} \text{ days}$



Q.3) A can do a piece of work in 10 days, B can do it in 15 days and C can do it in 20 days. They start the work together. But, after 2 days, A leaves off and after 3 days, C leaves off. B will do the remaining work. In how many days will the work get complete?

- A) 8 days
- B) 4 days
- C) $9\frac{3}{4}$ days
- D) $8\frac{4}{5}$ days

		60 unit
A \rightarrow 10 days		6 ✓
B \rightarrow 15 days		4 ✓
C \rightarrow 20 days		3 ✓

$A+B+C \rightarrow 2 \text{ days} \times 13 = 26 \text{ unit}$
 $B+C \rightarrow 1 \text{ day} \times 7 = 7 \text{ unit}$
33 unit

$R_{work} = 60 - 33 = 27 \text{ unit}$
 $B = \frac{27}{4} = 6\frac{3}{4} \text{ days}$
 $2 + 6\frac{3}{4} = 8\frac{3}{4} \text{ days}$



Q.4) The rates of working of P and Q are in the ratio $7 : 5$. The numbers of days taken by them to finish the work are in the ratio:

- A) 7:5
- B) 9:16
- C) 5:7
- D) None

	P	Q
Efficiency	7	5
Time	5	7

Work Constant
Time $\propto \frac{1}{\text{Effy}}$



Q.5) A is thrice as good a workman as B and therefore A is able to finish a job in 40 days less than B. Working together, they can do it in –

- A) 20 days
- B) $22 \frac{1}{2}$ days
- C) 15 days
- D) 30 days

$$\begin{array}{c} \text{Efficiency} \\ A \quad B \\ 3 \quad 1 \end{array}$$

$$\begin{array}{c} \text{Time} \\ 1 \quad 3 \\ \swarrow \quad \searrow \\ 20 \text{ days} \quad 60 \text{ days} \\ 2 \rightarrow 40 \\ 1 \rightarrow 20 \end{array}$$

$$\begin{array}{l} \text{Work} = \text{Time} \times \text{Efficiency} \\ = \begin{array}{cc} \downarrow & \downarrow \\ A & A \\ \downarrow & \downarrow \\ A+B & A+B \end{array} \end{array}$$

$$\begin{array}{l} \text{Work} = 3 \times 20 = 60 \text{ unit} \\ 1 \times 60 = 60 \text{ unit} \end{array}$$

$$A+B = \frac{60}{3+1} = \frac{60}{4} = 15 \text{ days}$$



Q.6) To do a certain work B would take three times as long as A and C together and C twice as long as A and B together. The three men together complete the work in 10 days. How long would A take separately?

- A) 30 days
- B) 24 days
- C) 25 days
- D) 28 days

$$A+B+C = 10 \text{ days}$$

$$\text{Work} = \text{Time} \times \text{Effy}$$

$$10 \times 12 = 120 \text{ unit}$$

$$\frac{B}{3} = \frac{A+C}{1}$$

$$(1 = 3) \times 3$$

$$\textcircled{3} = \textcircled{9}$$

$$\frac{C}{2} = \frac{A+B}{1}$$

$$(1 = 2) \times 4$$

$$4 = 8$$

$$A = 5 \checkmark$$

$$B = 3 \checkmark$$

$$C = 4 \checkmark$$

$$12$$

$$A(\text{Time}) = \frac{120}{5} = \textcircled{24 \text{ days}}$$



Q.7) 3 men or 5 women can do a work in 12 days. How long will 6 men and 5 women take to finish work?

- A) 4 days
B) 10 days
C) 5 days
D) 2 days

Work Work

$$3M \times 12 \text{ days} = 5W \times 12 \text{ days}$$

$$3M = 5W$$
$$\frac{M}{W} = \frac{5}{3}$$

Work = $3 \times 5 \times 12 = 180 \text{ unit}$
 $5 \times 3 \times 12 = 180 \text{ unit}$

Work Combination

$$6 \text{ men} + 5 \text{ Women} = ?$$

↓ × 5 ↓ × 3

$$30 + 15 = 45 \text{ unit/day}$$
$$\frac{180}{45} = 4 \text{ days}$$



Q.8) If 12 men and 16 boys can do a piece of work in 5 days and 13 men and 24 boys can do it in 4 days, how long will 7 men and 10 boys take to do it?

- A) $9\frac{1}{3}$ days
B) $8\frac{1}{3}$ days
C) $8\frac{2}{3}$ days
D) 8 days

$$(12M + 16B) \times 5 \text{ days} = (13M + 24B) \times 4 \text{ days}$$

$$60M + 80B = 52M + 96B$$

$$60M - 52M = 96B - 80B$$

$$8M = 16B$$

$$\frac{M}{B} = \frac{16}{8} = 2$$

$$\begin{aligned} \text{Work} &= (12 \times 2 + 16 \times 1) \times 5 \\ &= \boxed{200 \text{ unit}} \end{aligned}$$

$$\begin{aligned} &\boxed{7M + 10B = ?} \\ &\downarrow \times 2 \quad \downarrow \times 1 \\ &14 \quad 10 = \underline{\underline{24 \text{ unit/day}}} \end{aligned}$$

$$\frac{200}{24} = \frac{25}{3} = \underline{\underline{8\frac{1}{3} \text{ days}}}$$



Q.9) 10 men can do a piece of work in 12 days. 5 women can do it in 36 days and 8 children can do it in 30 days. In how many days can 6 men, 9 women and 6 children together complete the piece of work?

- A) 8 days
- B) 12 days
- C) 14 days
- D) 6 days

Home Work



Comment



Q.10) A alone would take $6\frac{3}{4}$ days more to complete the job than if both A and B worked together. If B worked alone, he took 12 days more to complete the job than A and B worked together. What time would they take if both A and B worked together?

- A) 7 days
- B) 9 days
- C) 11 days
- D) None of these

$$A+B = x \text{ days}$$

$$A = x + 6\frac{3}{4} \text{ days}$$

$$B = x + 12 \text{ days}$$

Trik

$$A+B = \sqrt{6\frac{3}{4} \times 12}$$

$$= \sqrt{\frac{27}{4} \times 12} = \sqrt{81} = 9 \text{ days}$$

x^2
 x^2



Q.11) Pipes A and B can fill a tank in 20 hrs and 30 hrs resp. and pipe C can empty the full tank in 15 hrs. If all the pipes are opened together, how much time will be needed to make the tank full.

- A) 30 hrs.
- B) 120 hrs
- C) 60 hrs
- D) 45 hrs

$$\begin{array}{r|l} & 60 \text{ ltr.} \\ A \rightarrow (+20) & +3 \\ B \rightarrow (+30) & +2 \\ C \rightarrow (-15) & -4 \end{array}$$

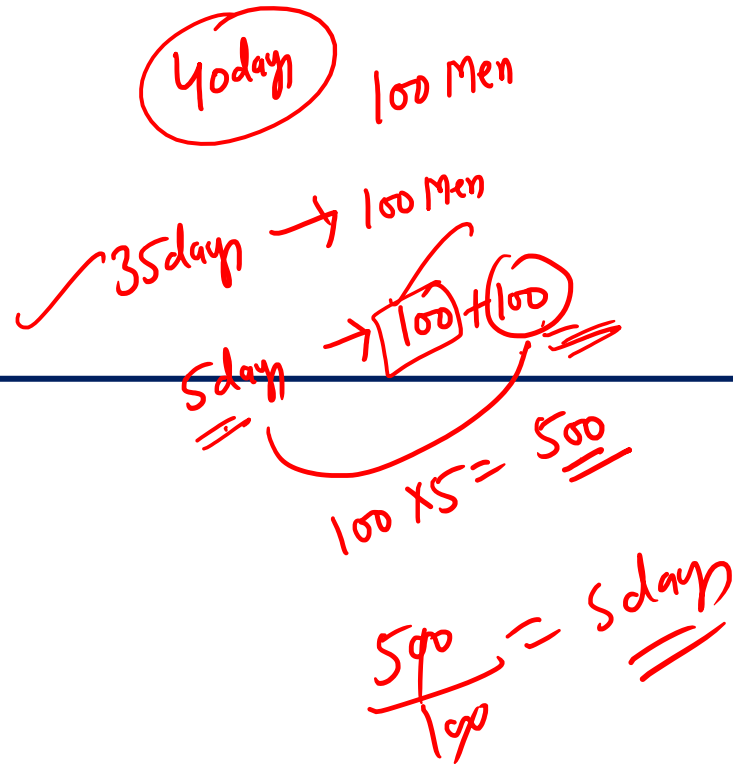
$$A+B+C = +3 + 2 - 4 = 1 \text{ ltr/h}$$

$$\frac{60}{1} = 60 \text{ hours}$$



Q.12) A builder decided to build a farmhouse in 40 days. He employed 100 men in the beginning and 100 more after 35 days and completed the construction in stipulated time. If he had not employed the additional men, how many days behind schedule would it have been finished?

- A) 5 days
- B) 6 days
- C) 8 days
- D) 10 days
- E) None of these



Chain Rule

Work - Two parts

$$\frac{M_1 T_1}{W_1} = \frac{M_2 T_2}{W_2}$$



Q.13) A contractor undertakes to dig a canal 12 km long in 350 days and employs 45 men. After 200 days he find that only 4.5 km of the canal has been completed. Find the number of extra men he must employ to finish the work in time?

- A) 45 men
- B) 55 men
- C) 65 men
- D) 75 men
- E) None of these

200 days
45 Men
4.5 KM

150 days
45 + ? = x Men → 100 - 45
= 55 Men
12 - 4.5 = 7.5 KM

$$\frac{M_1 T_1}{W_1} = \frac{M_2 T_2}{W_2}$$

$$\frac{45 \times 200}{4.5} = \frac{x \times 150}{7.5}$$

$$x = 100$$



Q.14) A, B, C and D can finish a task in 24, 30, 40 and 60 days respectively. If 30 percent of the total work is already completed, then which of the following options is possible to complete the work?

- [1] ~~Each of them worked for 5 days = $14 \times 5 = 70$~~
- [2] A worked for 6 days, B worked for 6 days, C worked for 6 days and D worked for 5 days $12 \times 6 + 2 \times 5 = 82$
- [3] ~~A and D worked for 5 days, B and C worked for 5 days~~ $7 \times 5 + 7 \times 5 = 70$
- [4] A and C worked for 4 days, B worked for 9 days and D worked for 6 days $8 \times 4 + 4 \times 9 + 2 \times 6 = 80$
- [5] A and B worked for 4 days, C worked for 10 days and D worked for 9 days

	120 unit
A → 24	5 ✓
B → 30	4 ✓
C → 40	3 ✓
D → 60	2 ✓

$$120 \times 30\% = 36$$

$$120 - 36 = \boxed{84 \text{ unit}}$$

$$(9 \times 4) + (3 \times 10) + (2 \times 9)$$

$$36 + 30 + 18$$

$$= \underline{\underline{84}}$$

Q.15) If A, B and C together can complete a work in 8 days. In how many days, A alone can complete the whole work?

Statement I: C alone can complete the work in 24 days.

Statement II: A and B can complete the work in 16 days. B and C can complete the same work in $9\frac{3}{5}$ days.

- [1] Only statement I is sufficient to answer the question
- [2] Only statement II is sufficient to answer the question
- [3] Both statements are sufficient to answer the question
- [4] Either statement I or II is sufficient to answer the question
- [5] Neither statement I nor II is sufficient to answer the question

①

$$\begin{array}{l} A+B+C \rightarrow 8 \text{ day} \\ C \rightarrow 24 \text{ day} \end{array}$$

②

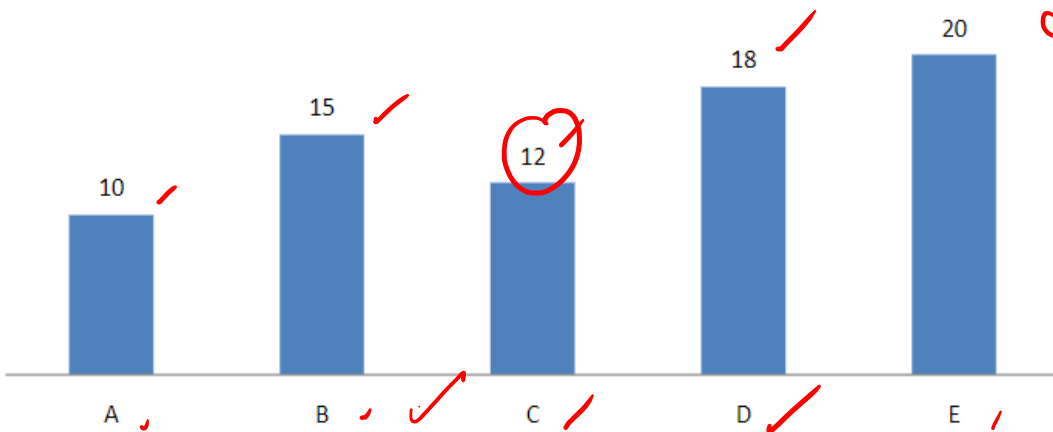
1	2	3	48
↑	↑	↑	6
$A+B+C \rightarrow 8 \text{ day}$			
$A+B \rightarrow 16 \text{ day}$			3
$B+C \rightarrow 9\frac{3}{5} \text{ day}$			5
2 3			

$$\frac{48}{1} = 48 \text{ day}$$



Study the following information carefully and answer the given questions. The following bar graph shows the number of days taken by 5 different persons to complete a work and the table shows the ratio of total number of days taken by another 5 different persons to complete the work.

Number of days taken by different persons to complete the work



Persons	Ratio
A : P	5 : 8
B : Q	3 : 4
C : R	1 : 2 12 = 24
D : S	6 : 7
E : T	5 : 3

Q16. A and R started the work and after 5 days A left the job, R and M complete the remaining work in $3\frac{1}{2}$ days. Find the total number of days taken by M alone to complete the work?

- a) 24 days
- b) 20 days
- c) 18 days
- d) 16 days
- e) None of these

$$\begin{array}{r|l}
 & 120 \\
 A \rightarrow 10 \text{ days} & 12 \\
 R \rightarrow 24 \text{ days} & 5 \\
 \hline
 & 5
 \end{array}
 \quad
 M = \frac{120}{5} = 24 \text{ days}$$

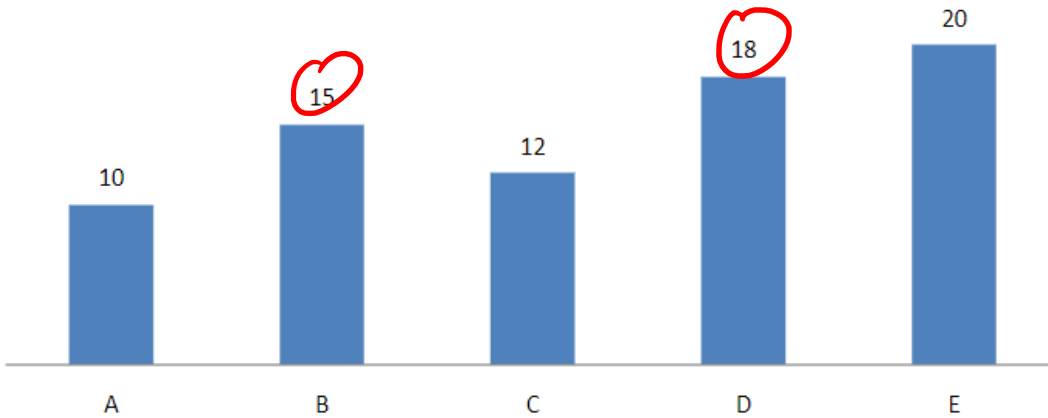
$$A + R \rightarrow 5 \text{ days} \times 17 = 85 \text{ unit}$$

$$R_{\text{work}} = 120 - 85 = 35 \text{ unit}$$

$$\begin{array}{r}
 R + M = \frac{35}{7} \times 2 = 10 \text{ unit/day} \\
 \downarrow \quad \downarrow \\
 5 \quad 5
 \end{array}$$

Study the following information carefully and answer the given questions. The following bar graph shows the number of days taken by 5 different persons to complete a work and the table shows the ratio of total number of days taken by another 5 different persons to complete the work.

Number of days taken by different persons to complete the work



Persons	Ratio
A : P	5 : 8
B : Q	3 : 4
C : R	1 : 2
D : S ✓	6 : 7 18 : 21
E : T	5 : 3

Q17. B and S started the work and after some days B left the job. S completed the remaining work in 9 days. The number of days after which B left the job?

- a) 7 days
- b) 4 days
- c) 6 days
- d) 5 days
- e) None of these

$$\begin{array}{r}
 105 \text{ unit} \\
 \hline
 B \rightarrow 15 \text{ days} \quad | \quad 7 \checkmark \\
 S \rightarrow 21 \text{ days} \quad | \quad 5 \checkmark \\
 \hline
 \end{array}$$

$$S \rightarrow 9 \times 5 = 45 \text{ unit}$$

$$105 - 45 = 60 \text{ unit}$$

$$B + S = \frac{60 \text{ unit}}{12} = 5 \text{ days}$$

Q18. A can complete a project in 20 days and B can complete the same project in 30 days. If A and B start working on the project together and A quits 10 days before the project is completed, in how many days will the project be completed?

- A. 18 days
- B. 27 days
- C. 26.67 days
- D. 16 days
- E. 12 days

60 unit	
A → 20 days	3
B → 30 days	2

n days

T_{ncb}

$$(n-10)3 + n(2) = 60$$

$$3n - 30 + 2n = 60$$

$$5n = 60 + 30 = 90$$

$$n = \frac{90}{5} = 18 \text{ days}$$

$$\frac{60 + 10(3)}{3+2} = \frac{90}{5} = 18 \text{ days}$$



Q19. Alekh and Alia can together do a piece of work in 5 days which Alia and Aman together can do in 15 days. After Alekh has been working at it for 4 days and Alia for 5 days, Aman then takes up and completes the work alone in 4 days. In how many days can Alia do the work alone?

- A. 30 days
- B. 45 days
- C. 50 days
- D. 25 days
- E. None of these

	15 unit
Alekh + Alia → 5 days	3
Alia + Aman → 15 days	1

$$\text{Alia} = 1 - \frac{2}{3} = \frac{1}{3}$$

$$\frac{15}{\frac{1}{3}} \times 3 = 45 \text{ days}$$

$$\text{Alekh (4 days)} + \text{Alia (5 days)} + \text{Aman (4 days)}$$

$$(\text{Alekh} + \text{Alia}) (4 \text{ days}) + (\text{Alia} + \text{Aman}) 1 \text{ day} + \text{Aman (3 days)} = 15$$

$$(3 \times 4) + (1)1 + \text{Aman (3 days)} = 15$$

$$= 15 - 13 = 2$$

$$\text{Aman} = \frac{2}{3} \text{ unit/day}$$



Q.20) Aman and Suman alone can do $\frac{3}{4}$ th and $\frac{2}{3}$ rd of a work in 36 days individually. If Suman and Gagan together can do the same work in ___ days and they have together their efficiency 12 units per day. Then in ___ days Aman, Suman and Gagan will complete the whole work, if they work in alternate days, starting with Gagan, after that Suman and then Aman respectively?

[1] 58 days, 62 days

[2] 36 days, 62 days

[3] 65 days, 36 days

[4] 44 days, 54 days

[5] None of these

Homework
↓
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Thank You

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