



TIME and WORK

LCM Method

This can be understood in terms of the above example in the following way:

Let us assume that total work to be equal to the LCM of the days taken by Amit and Vinit (i.e., of 10 and 15).

Assume work = 60 units

Work done by Amit in one day = 5 units

Work done by Vinit in one day = 4 units

Work done by both of them in one day when working together = 9 units

So, the number of days taken by both of them when

working together = $60/9 = 6\frac{2}{3}$ days

Application of STD table (LCM Method)

Speed (S) or Efficiency	Time (T)	Distance (D) Total work (LCM)
LCM/T	LCM/S	LCM

Example

A can finish a work in 24 days, B in 9 days and C in 12 days. B & C start the work but are forced to leave after 3 days. The remaining work done by A in ?

Solution:

LCM of 24,12,9 = 72 (total work)

Find speed column (follow red arrow)

Given →

B+C work for 3 days

(follow 2nd table)

So combined speed of B+C=8+6=14

D = 14×3=42

Remaining work = 72-42=30

A's speed =3

Time taken by A to do remaining work = 30/3 = 10

	S	T	D (LCM)
A	?	24	72
B	?	9	72
C	?	12	72

Divide

	S	T	D (LCM)
B+C	8+6 =14	3	42
A	3	?	30

Divide

Previous year questions

Q1.

12 men can complete a piece of work In 36 days. 18 women can complete the same piece of work in 60 days. 8 men and 20 women work together for 20 days.

If only women were to complete the remaining piece of work In 4 days, how many women would be required?

(a)70

(b)28

(c)66

(d)40

(e) None of these

Q2.

9 children can complete a piece of work in 360 days.

18 men can complete the same piece of work in 72

days and 12 women can complete the piece of work in

162 days in how many days can 4 men12 women and

10 children together complete the piece of work?

(a)12

(b)36

(c)48

(d)24

(e) None of these

Q3.

Fifty six men can complete a piece of work in 24 days.

In how many days can 42 men complete the same

piece of work?

(a) 18 days

(b) 32 days

(c) 98 days

(d) 48 days

(e)None of these

Q4.

42 women can do a piece of work in 18 days. How

many women would be required to do the same work

in 21 days?

(a)36

(b)24

(c)30

(d)44

(e) None of these

Q5.

30 men can do a piece of work in 16 days. How many

men would be required to do the same work in 20

days?

(a)12

(b)36

(c)48

(d)24

(e) None of these

Q6.

8 men can complete a piece of work in 4 days. 12

women can complete the same piece of work in 4 days

whereas 8 children can complete the same piece of

work in 8 days. 2 men, 8 children and 3 women work

together for 2 days. If only women were to finish the

remaining work in 2 days, how many total women

would be required?

(a)12

(b)18

(c)24

(d)20



(e) None of these

Q7.

18 children can do a piece of work in 12 days. How many children would be required to do the same work in 8 days ?

(a) 12

(b) 18

(c) 24

(d) 27

(e) None of these

Q8.

8 men and 4 women together can complete a piece of work in 6 days. Work done by a man in one day is double the work done by a woman in one day. If 8 men and 4 women started working and after 2 days, 4 men left and 4 new women joined, in how many more days will the work be completed?

(a) 5 days

(b) 8 days

(c) 6 days

(d) 4 days

(e) 9 days

Q9.

B and C together can complete a work in 8 days. A and B together can complete the same work in 12 days and A and C together can complete the same work in 16 days. In how many days can A, B and C together complete the same work ?

(a) 48/13 days

(b) 96/13 days

(c) 89/12 days

(d) 41/12 days

(e) None of these

Q10.

10 men can complete a piece of work in 8 days. 20 women can complete the same piece of work in 6 days. In how many days. 16 men and 18 women together can complete the same piece of work?

(a) 19/5 days

(b) 27 days

(c) 24/7 days

(d) $2 + \frac{17}{7}$ days

(e) None of these

Q11.

Ayesha can complete a piece of work in 16 days. Amita can complete the same piece of work in 8 days. If both of them work together in how many days can they complete the same piece of work ?

(a) 6 days

(b) 22/5 days

(c) 16/3 days

(d) 12 days

(e) None of these

Q12.

6 men can complete a piece of work in 12 days. 8 women can complete the same piece of work, in 18 days whereas 18 children can complete the piece of work in 10 days, 4 men, 12 women and 20 children work together for 2 days. If only men were to complete the remaining work in 1 day how many men would be required totally ?

(a) 36

(b) 24

(c) 18

(d) Cannot be determined

(e) None of these

Q13.

3 men can complete a piece of work in 6 days. 5 women can complete the same work in 18 days. In how many days will 4 men and 10 women together complete the same work ?

(a) 3 days

(b) 5 days

(c) 2 days

(d) 4 days

(e) None of these

Q14.

8 men can complete a piece of work in 20 days. 8 women can complete the same work in 32 days. In how many days will 5 men and 8 women together complete the same work ?

(a) 16 days

(b) 12 days

(c) 14 days

(d) 10 days

(e) None of these

Q15.

2 men can complete a piece of work in 6 days. 2 women can complete the same piece of work in 9 days, whereas 3 children can complete the same piece of work in 8 days. 3 women and 4 children worked together for 1 day. If only men were to finish the remaining work in 1 day, how many total men would be required?

(a) 4

(b) 8

(c) 6

(d) Cannot be determined

(e) None of these

Q16.

Vikas gets rs. 350 for every day that he works. If he earns rs. 9,800 in a month of 31 days, for how many days did he work?

(a) 25 days

(b) 30 days

(c) 24 days

(d) 28 days

(e) None of these

**Q17.**

A water tank has three taps A, B and C. Tap A, when opened, can fill the water tank alone in 4 hours. Tap B, when opened, can fill the water tank alone in 6 hours and tap C, when opened, can empty the water tank alone in 3 hours. If taps A, B and C are opened simultaneously how long will it take to fill the tank completely?

- (a) 10 hours
- (b) 8 hours
- (c) 18 hours
- (d) 12 hours
- (e) None of these

Q18.

4 girls can do a piece of work in 8 days, 3 boys can do the same piece of work in 9 days, 7 men do the same piece of work in 2 days and 5 women can do the same piece of work in 4 days. Who is least efficient?

- (a) Boys
- (b) Girls
- (c) Women
- (d) Men
- (e) Boys and Men both

Q19.

Two men alone or three women alone can complete a piece of work in 4 days. In how many days can 1 woman and one man together complete the same piece of work?

- (a) 6 days
- (b) $24/5$ days
- (c) $12/1.75$ days
- (d) Cannot be determined
- (e) None of these

Q20.

Four examiners can examine a certain number of answer papers in 10 days by working for 5 hours a day. For how many hours in a day would 2 examiners have to work in order to examine twice the number of answer papers in 20 days?

- (a) 8 hours
- (b) $15/2$ hours
- (c) 10 hours
- (d) $17/2$ hours
- (e) None of these

Q21.

6 women and 6 men together can complete a piece of work in 6 days. In how many days can 15 men alone complete the piece of work if 9 women alone can complete the work in 10 days?

- (a) 6 days
- (b) 5 days
- (c) 7.2 days
- (d) Cannot be determined
- (e) None of these

Q22.

A and B together can complete a task in 20 days. B and C together can complete the same task in 30 days. A and C together can complete the same task in 40 days. What is the respective ratio of the number of days taken by A when completing the same task alone to the number of days taken by C when completing the same task alone?

- (a) 2:05
- (b) 2 : 7
- (c) 3:7
- (d) 1 : 5
- (e) 3: 5

Q23.

3 men can do a work in 12 days, 5 women can do the same work in 8 days and 20 children in 3 days. If all the men, women and children work together, in how many days will the work be completed?

- (a) $25/13$
- (b) $24/13$
- (c) 8
- (d) 3
- (e) none of these

Q24.

The part of work done by 9 boys and 3 men together in one day is four times the work done by a boy and a man together. What is the respective ratio of work done by a boy and a man?

- (a) 5 : 1
- (b) 1 : 5
- (c) 4:1
- (d) 1 : 4
- (e) None of these

Q25.

In a tank there are three inlet pipes P, Q and R and one outlet pipe S. Pipe R fills the tank two times faster than pipe P and three times faster than pipe Q. Outlet S takes 10 minutes to empty the full tank. Time taken by inlet R to fill the empty tank is $2/5$ th of the time taken by S to empty the full tank. In what time will the inlets P and Q together fill the empty tank?

- (a) $24/5$ minutes
- (b) $22/5$ minutes
- (c) $19/5$ minutes
- (d) $17/5$ minutes
- (e) None of these

Q26.

24 workers working 13 hours daily make a wall of dimensions 224 m x 16 m x 52 m in 32 days. In how many days will 36 workers working 18 hours daily make a wall of dimensions 432 m x 21 m x 64 m?

- (a) 58 days
- (b) 42 days
- (c) 48 days



- (d) 60 days
- (e) None of these

Q27.

Two pipes A and B can fill an empty tank in 18 minutes and 27 minutes respectively. There is a leakage in the bottom of the tank, due to which 14.4 minutes more time is taken by both the pipes in filling the tank. What time will the leak take in emptying the completely full tank ?

- (a) 16.9 minutes
- (b) 20 minutes
- (c) 17.9 minutes
- (d) 18.9 minutes
- (e) None of these

Q28.

Sixteen men and twelve women can complete a work in 8 days, if 20 men can complete the same work in 16 days, in how many days 16 women can complete the same piece of work ?

- (a) 12
- (b) 8
- (c) 10
- (d) 15
- (e) 20

Q29.

If 36 persons are engaged on a piece of work, the work can be completed in 40 days. After 32 days, only $\frac{3}{4}$ th of the work was completed. How many more persons are required to complete the work on time ?

- (a) 10
- (b) 8
- (c) 9
- (d) 12
- (e) None of these

Q30.

12 men can finish a project in 20 days. 18 women can finish the same project in 16 days and 24 children can finish it in 18 days. 8 women and 16 children worked for 9 days and then left. In how many days will 10 men complete the remaining project ?

- (a) $21\frac{1}{2}$
- (b) 10
- (c) 9
- (d) $23\frac{1}{2}$
- (e) $19\frac{1}{2}$

Q31.

28 men can complete a piece of work in 15 days and 15 women can complete the same piece of work in 24 days. What is the respective ratio between the amount of work done by 30 men in 1 day and the amount of work done by 18 women in 1 day ?

- (a) 10 : 7
- (b) 3 : 5
- (c) 5 : 4

- (d) 9 : 5

- (e) None of these

Q32.

24 men can complete a piece of work in 18 days while 12 women can complete the same piece of work in 28 days. 27 men start working and are replaced by 14 women after 8 days. In how many days will 14 women finish the remaining work ?

- (a) 12 days
- (b) 14 days
- (c) 13 days
- (d) $25\frac{1}{2}$ days
- (e) 15 days

Q33.

18 men can complete a project in 30 days and 16 women can complete the same project in 36 days. 15 men start working and after 9 days they are replaced by 18 women. In how many days will 18 women complete the remaining work ?

- (a) 20
- (b) 30
- (c) 26
- (d) 28
- (e) 24

Q34.

A project requires 12 women to complete it in 16 days. 12 women started working and after a few days from the start of the project, 4 women left. If the remaining project was completed in 18 days, in how many days the whole project was completed ?

- (a) $49\frac{1}{2}$
- (b) 26
- (c) 22
- (d) $43\frac{1}{2}$
- (e) 20

Q35.

15 men and 16 women together can complete a piece of work in 6 days. If 12 women can complete the same project in 32 days, in how many days will 10 men complete the same project ?

- (a) 12
- (b) 20
- (c) 16
- (d) 8
- (e) 14

Q36.

Three men, four women and six children can complete a work in 7 days. A woman does double the work a man does and a child does half the work a man does. How many women alone can complete this work in 7 days ?

- (a) 8
- (b) 7
- (c) 12



(d) Cannot be determined

(e) None of these

Q37.

12 men take 36 days to do a work while 12 women complete $\frac{3}{4}$ in of the same work in 36 days. In how many days 10 men and 8 women together will complete the same work?

(a) 6 days

(b) 27 days

(c) 12 days

(d) Data inadequate

(e) None of these

Q38.

A' can complete a piece of work in 12 days. 'A' and 'B' together can complete the same piece of work in 8 days. In how many days can 'B' alone complete the same piece of work?

(a) 15 days

(b) 18 days

(c) 24 days

(d) 28 days

(e) None of these

Q39.

12 men can do a piece of work in 10 days. How many men would be required to do the same work in 8 days ?

(a) 14

(b) 18

(c) 16

(d) 12

(e) None of these

Q40.

A and B together complete a piece of work in T days. If A alone completes the work in T +3 days and B alone completes the piece of work in T+12 days, what is T?

(a) 3 days

(b) 12 days

(c) 9 days

(d) Cannot be determined

(e) None of these

Q41.

4 men can complete a piece of work in 2 days. 4 women can complete the same piece of work in 4 days whereas 5 children can complete the same piece of work in 4 days. If, 2 men, 4 women and 10 children work together, in how many days can the work be completed ?

(a) 1 day

(b) 3 days

(c) 2 days

(d) 4 days

(e) None of these

Q42.

Amit and Sujit together can complete an assignment of data entry in 5 days. Sujit's speed is 80% of Amit's speed and the total key depressions in the assignment are 5,76,0 What is Amit's speed in key depressions per hour if they work for 8 hours a day ?

(a) 4800

(b) 6400

(c) 8000

(d) 7200

(e) None of these

Q43.

Shruti takes 10 days to finish a piece of work while Shankar takes 15 days to finish the same piece of work. Harish works twice as fast as Shruti. How many days will all three of them together take to finish the same piece of work ?

(a) $\frac{42}{11}$ days

(b) $\frac{32}{11}$ day

(c) $\frac{30}{11}$ days

(d) $\frac{29}{11}$

(e) None of these

Q44.

A and B together can complete a piece of work in $\frac{72}{7}$ days while B and C together can complete the same work in $\frac{40}{3}$ days. B is 25% more efficient than C. In how many days will A and C together complete the same work ?

(a) $\frac{45}{4}$

(b) $\frac{49}{4}$

(c) $\frac{34}{3}$

(d) $\frac{37}{3}$

(e) None of these

Q45.

10 men can finish a piece of work in 15 days 8 women can finish the same piece of work in 25 days. Only 10 women started working and in few days completed certain amount of work. After that 3 men joined them. The remaining work was completed by 10 women and 3 men together in 5 days. After how many days 3 men joined 10 women ?

(a) 11

(b) 13

(c) 15

(d) 10

(e) 12

Q46.

A project manager hired 16 men to complete a project in 38 days. However, after 30 days, he realized that only $\frac{5}{9}$ of the work is, complete. How many more men does he need to hire to complete the project on time ?

(a) 48

(b) 24

(c) 32



(d) 16

(e) 36

Q47.

9 Men working for 7 hours a day can complete a piece of work in 15 days. In how many days can 6 men working for 9 hours a day, complete the same piece of work ?

(a) 35/2 days

(b) 67/4 days

(c) 16 days

(d) 63 days

(e) None of these

Q48.

If 12 boys or 15 girls can do a work in 48 days. In what time will 24 boys and 6 girls do twice the work?

(a) 42 days

(b) 40 days

(c) 45 days

(d) 30 days

(e) None of these

Q49.

Three typists P, Q and R have to type 368-pages. P types one page in 8 minutes, Q in 18 minutes and R in 24 minutes. In what time will these pages be typed if they work together?

(a) 25 hours

(b) 27.6 hours

(c) 27 hours

(d) 28 hours

(e) None of these

Q50.

6 men can complete a piece of work in 12 days. 8 women can complete the same piece of work in 18 days and 18 children can do it in 10 days. 4 men, 12 women and 20 children do the work for 2 days. If the remaining work be completed by men only in 1 day, how many men will be required?

(a) 36

(b) 24

(c) 18

(d) Cannot be determined

(e) None of these

Q51.

ANSWERS :

1 a	2 b	3 b	4 a	5 d	6 a
7 d	8 a	9 b	10 e	11 c	12 a
13 a	14 a	15 b	16 d	17 d	18 b
19 b	20 c	21 e	22 d	23 b	24 b
25 a	26 c	27 d	28 c	29 c	30 b
31 a	32 a	33 e	34 c	35 a	36 b
37 b	38 c	39 e	40 e	41 a	42 c
43 c	44 a	45 b	46 c	47 a	48 b

M and N can do a work in 10 days and 15 days respectively. If M starts on the work and both work alternately day after day , In how many days will the work be completed ?

(a) 10 days

(b) 12 days

(c) 8 days

(d) 9 days

(e) None of these

Q52.

20 men can complete a piece of work in 16 days. After 5 days from the start of the work, some men left. If the remaining work was completed by the remaining men in 55/3 days, how many men left after 5 days from the start of the work?

(a) 4

(b) 10

(c) 8

(d) 5

(e) 6

Q53.

12 men can finish a piece of work in 20 days, 8 men started working and after 10 days they were replaced by 18 women. These 18 women finished the remaining work in 16 days. In how many days can 18 women finish the whole work?

(a) 32

(b) 18

(c) 28

(d) 24

(e) 21

Q54.

8 men can finish a piece of work in 21 days. 14 men started working and after 3 days were replaced by 9 women. These 9 women finished the remaining work in 24 days. In how many days 9 women can finish the whole work?

(a) 24

(b) 26

(c) 36

(d) 32

(e) 30

49 b 50 e 51 a 52 e 53 d 54 b

1.(1) 12 men can complete the work in 36 days.

∴ 12 × 36 men can complete the work in 1 day.

Again,

18 women can complete the work 60 days

∴ 18 × 60 women can complete the work in 1 day.

12 × 36 men = 18 × 60 women = 2 men = 5 women

Now, 8 men + 20 women

= (4 × 5 + 20)



$= (4 \times 5 + 20)$ women = 40 women
 \therefore 18 women complete the work in 60 days.
 \therefore 40 women' 20 days' work
 $= (40 \times 20)/(18 \times 60) = 20/27$
 \therefore Remaining work
 $= 1 - 20/27 = 7/27$
 \therefore 18 \times 60 women do 1 work in 1 day.
 \therefore 1 women does
 $= 1/18 \times 60$ work in 1 day
 \therefore 1 women does in 4 days
 $= 4/(18 \times 60) = 1/(18 \times 15)$ work
 \therefore 1/(18 \times 15) work is done in 4 days by 1 woman
 \therefore 1/27 work is done in 4 days by
 $= (18 \times 15 \times 7)/27 = 70$ days women
 or
 Work done by 1 man in 1 day
 $= 1/(12 \times 36)$
 Work done by 8 men in 20 days
 $= (8 \times 20)/(12 \times 36)$
 Again, work done by 1 women in 1 days
 $= 1/(18 \times 60)$
 Work done by 20 women in 20 days = $(20 \times 20)/(18 \times 60)$

Total work done in 20 days
 $= (8 \times 20)/(12 \times 36) + (20 \times 20)/(18 \times 60) = 20/27$
 Remaining work
 $= 7/27 = (1 - 20/27)$
 Now, work done by 1 women in 4 days = $4/(18 \times 60)$
 \therefore 7/27 work is done by
 $(18 \times 60 \times 7)/(4 \times 27) = 70$ women

2.(2) Clearly,
 9×360 children = 18×72 men
 $= 12 \times 162$ women
 $= 45$ children = 18 men
 $= 27$ women
 $= 5$ children = 2 men = 3 women
 Now, 4 men + 12 women + 10 children
 $= 4$ men + 8 men + 4 men
 $= 16$ men
 \therefore 18 men can complete the work in 72 days.
 \therefore 16 men can complete work in
 $= (18 \times 72)/16 = 81$ days

3.(2) \therefore 56 men can complete 1 work in 24 days
 \therefore 1 man complete the work in 24×56 days
 \therefore 42 men will do the some work in
 $= (24 \times 56)/42 = 32$ days

Method 2:

[Quicker Method]

$\therefore M_1D_1 = M_2D_2$
 $\therefore (56 \times 24)/42 = 32$ days

4.(1) Days Women
 18 \uparrow 42 \downarrow
 21 \uparrow x \downarrow

$\therefore 21 : 18 :: 42 : x$
 $x = 42 \times 18/21 = 36$

5.(40 Days Men

 16 \uparrow 30 \downarrow
 20 \uparrow x \downarrow

$\therefore 20 : 16 :: 30 : x$
 $= 20 \times x = 16 \times 30$
 $= x = 30 \times 16/20 = 24$

6.(1) As per given information,

8×4 men = 12×4 women
 $= 8 \times 8$ children
 $= 32$ men = 48 women
 $=$ children
 $= 2$ men = 3 women = 4 children
 $\therefore 2$ men + 8 children + 3 women
 $= (3 + 6 + 3)$ women = 12 women
 12 women's 2 day's work = $\frac{1}{2}$
 Remaining work
 $= 1/2$

\therefore Required number of women = 12

7.(4) Days Children

 12 18
 8 x

$\therefore 8 : 12 = 18 : x$
 $= 8x = 12 \times 18$
 $\therefore x = 12 \times 18/8 = 27$

Note : You can use the formula:

$M_1D_1 = M_2D_2$ and solved it.

8.(1) According to the question.

1 man = 2 women
 $\therefore 8$ men + 4 women
 $= (16 + 4)$ women = 20 women
 4 men + 8 women = 16 women
 20 women's 2 days work
 $= 2/6 = 1/3$

Remaining work = $1 - 1/3 = 2/3$

\therefore 20 women complete 1 work in 6 days.

\therefore 16 women will do 2/3 work in

$= (20 \times 6)/16 \times (2/3) = 5$ days

9.(2) (B + C)'s 1 day's work = 1/8 (i)

(A + B)'s 1 day's work = 1/12 (ii)

(A + B)'s 1 day's work = 1/16 (iii)

On adding all these three equations.

2 (A + B + C)'s 1 day's work

$= 1/8 + 1/12 + 1/16 = (6 + 4 + 3)/48 = 13/48$

$= (A + B + C)$'s 1 days' work

$= 13/96$

\therefore A, B, and C together can complete the work in 96/13 days

10.(5) 10 men complete the work in 1 days.

\therefore 80 men will complete the work in 1 day.

Again,

20 women complete the work in 6 days.



∴ 120 women complete the work in 1 day.
= 80 men = 120 women
= 2 men = 3 women

∴ 16 men + 18 women + 16 men
+ 18 × 2/3 men = 28 men
∴ 10 men can do the work in 8 days
∴ 28 men can do the work in

$$(10 \times 8)/28 = 20/7 \text{ days}$$

11.(3) Ayesha's and Amita's 1 day's work
= 1/16 + 1/8 = (1 + 2)/16 = 3/16

∴ Ayesha and Amita together can complete the work in
= 16/3 = days/

12.(1) 72 men = 144 women = 180 children
= 2 men = 4 women = children

∴ 4 men + 12 women + 20 children
= 4 men + 6 men + 8 men = 18 men
When 6 men do 1 work in 12 days.

18 men will do the same in 4 days
∴ Remaining work = 1/2

$$\text{Now, } M_1D_1/W_1 = M_2D_2/W_2 \\ = \frac{1}{2} \times 6 \times 12 = 1 \times M_2 \\ = M_2 = 36 = \text{Number of men}$$

13.(1) [Tricky approach]

= 18 men = 5 × 18 = 90 women
∴ 1 men = 5 women

∴ 4 men + 0 women = 30 women,
 $M_1D_1 = M_2D_2$

$$= 5 \times 18 = 30 D_2 \\ = D_2 = (5 \times 18)/30 = 3 \text{ days}$$

14.(1) 8 × 20 men = 8 × 32 women
= 5 men = 8 women

5 men + 8 women = 16 women
 $M_1D_1 = M_2D_2$

$$= 8 \times 32 = 16 \times D_2 \\ = D_2 = (8 \times 32)/16 = 16 \text{ days}$$

15.(2) 2 × 6 men = 18 women
= 24 children

2 men = 3 women = 4 men
part of work done in 1 day by 4
men = 1/3

∴ Remaining 2/3 work will be finished by 8 men in 1 day.
Hence, 8 men would be required.

16.(4) Number of days = 9800/350 = 28

17.(4) Part of the tank filled in 1 hour when all the taps
are opened

$$= \frac{1}{4} + \frac{1}{6} - \frac{1}{3} \\ = (3 + 2 + 4)/12 = 1/12$$

Hence, the tank will be filled in 12 hours.

18.(2) 4 × 8 girls = 3 × 9 boys

= 7 × 2 men = 5 × 4 women
= 32 girls = 27 boys = 14 men
= 20 women

19.(2) 2 men = 3 women

1 man + 1 woman
= (3/2 + 1) women = 5/2

$$M_1D_1 = M_2D_2 \\ = 3 \times 4 = 5/2 \times D_2 \\ = D_2 = (3 \times 4 \times 2)/5 = 24/5 \text{ days}$$

20.(3) Examiners Work Days Hours/day

$$\begin{array}{ccc} 4 \uparrow & 1 \downarrow & 10 \uparrow & 5 \downarrow \\ 2 \uparrow & 2 \downarrow & 20 \uparrow & x \downarrow \end{array}$$

$$\therefore \left. \begin{array}{l} 2 : 4 \\ 1 : 2 \\ 20 : 10 \end{array} \right\} :: 5 : x$$

$$= 2 \times 20 \times x \times = 4 \times 10 \times 5 \times 2 \\ = x = (4 \times 10 \times 5 \times 2)/(2 \times 20) \\ = 10 \text{ hours}$$

21.(5) $M_1D_1/W_1 = M_2D_2/W_2$

$$= (6 \times 6)/W_1 = (9 \times 10)/1 \\ = W_1 = (6 \times 6)/(9 \times 10) = 2/5$$

∴ Part of work done by 6 women
in 6 days = 2/5

∴ Part of work done by 6 women in 6 days = 2/5

∴ Part of work done by 6 men in 6 days
= 1 - 2/5 = 3/5

$$M_1D_1/W_1 = M_2D_2/W_2 \\ = (6 \times 6)/(3/5) = (15 \times D_2)/1 \\ = 15 \times D_2 = (6 \times 6 \times 5)/3 = 60 \\ = D_2 = 60/15 = 4 \text{ days}$$

22.(4) (A + B)'s 1 days work = 1/20

= (B + C)'s 1 day's work = 1/30

= (C + A)'s 1 day's work = 1/40

On adding,

$$2(A + B + C)'s 1 day's work \\ = 1/20 + 1/30 + 1/40 \\ = (6 + 4 + 3)/120 = 13/120$$

∴ (A + B + C)'s 1 days' work
= 13/240

∴ A's 1 day's work
= 13/240

$$\therefore A's 1 day's work \\ = 12/240 - 1/30 = (13 - 8)/240 \\ = 5/240 = 1/48$$

$$C's 1 day's work \\ = 13/240 - 1/20 = 13 - 12/240 \\ = 1/240$$

∴ Required ratio = 48 : 240
or 1 : 5

23.(2) Part of work done in 1 day

$$= 1/12 + 1/8 + 1/3 \\ = (2 + 3 + 8)/24 = 13/24$$

∴ Required time = 24/13 days

24.(2) 9 boys + 3 men = 4 boys + 4 men

= 5 boys = 1 man



∴ Required ratio = 1 : 5

25.(1) Time taken by pipe R to fill the tank

$$2/5 \times 10 = 4 \text{ minutes}$$

∴ Time taken by pipe R to fill the empty tank

$$= 8 \text{ minutes}$$

∴ Time taken by pipe Q to fill the tank

$$= 12 \text{ minutes}$$

Part of tank filled by pipes P and Q in 1 minutes

$$= 1/8 + 1/12 = (3 + 2)/24 = 5/24$$

∴ Required time

$$= 24/5 \text{ minutes}$$

26.(3)

Workers	Working hours	Length	Width	Height	Days
24	13	224	16	52	32
36	18	432	21	64	x

$$\therefore \left. \begin{array}{l} 36 : 24 \\ 18 : 13 \\ 224 : 432 \\ 16 : 21 \\ 52 : 64 \end{array} \right\} : : 32 : x$$

$$\therefore 36 \times 18 \times 224 \times 16 \times 52 \times x$$

$$= 24 \times 13 \times 432 \times 21 \times 64 \times 32$$

$$= x = (24 \times 13 \times 432 \times 21 \times 64 \times 32) / (36 \times 18 \times 224 \times 16 \times 52)$$

$$= 48 \text{ days}$$

27.(4) Part of the tank filled by pipes A and B in 1 minutes

$$= 1/18 + 1/27 = (3 + 2)/54 = 5/54$$

∴ Time taken in filled the tank = 54/5 minutes

Time taken due to leakage

$$= 54/5 + 14.4 = (54 + 72)/5$$

$$= 126/5 \text{ minutes}$$

∴ Part of the tank emptied by leak in 1 minute

$$= 5/24 - 5/126 = (35 - 15)/378$$

$$= 20/378$$

∴ Required time = 378/20

$$= 18.9 \text{ minutes}$$

28.(3) 16 men + 12 women complete the work in 8 days.

20 men complete the work in 16 days.

$$\therefore 16 \times 8 \text{ men} + 12 \times 8 \text{ women}$$

$$= 20 \times 16 \text{ men}$$

$$= 128 \text{ men} + 96 \text{ women} = 320 \text{ men}$$

$$= 96 \text{ women} = 192 \text{ men}$$

$$= 1 \text{ women} = 2 \text{ men}$$

$$\therefore 16 \text{ women} = 32 \text{ men}$$

$$\therefore M_1 D_1 = M_2 D_2$$

$$= 20 \times 16 = 32 \times D_2$$

$$= D_2 = (20 \times 16) / 32 = 10 \text{ days}$$

29.(3) Remaining work

$$= 1 - 3/4 = 1/4; \text{ Remaining time} = 8 \text{ days}$$

$$= M_1 D_1 / W_2 = M_2 D_2 / W_2$$

$$= (36 \times 40) / 1 = (M_2 \times 8) / (1/4)$$

$$= 36 \times 40 = M_2 \times 32$$

$$= M_2 = (36 \times 40) / 32 = 45$$

$$\therefore \text{Additional men} = 45 - 36 = 9$$

$$\mathbf{30.(1)} = (24 \times 18) / 1 = (28 \times 9) / W_2$$

$$W_2 = (28 \times 9) / (24 \times 18) = 7/12$$

∴ Remaining work

$$= 1 - 7/12 = 5/12$$

This part of work is done by 10 men.

$$= M_1 D_1 / W_2 = M_2 D_2 / W_2$$

$$= (12 \times 20) / 1 = (10 \times D_2) / (5/12)$$

$$= 10 \times D_2 = 12 \times 20 \times 5/12$$

$$= 100$$

$$= D_2 = 100/10 = 10 \text{ days}$$

31. ∴ 28 men do 1 work in 15 days.

∴ Time taken by 30 men

$$= 15 \times 28/30 = 14 \text{ days}$$

∴ 15 women do the work in 24 days.

∴ Time taken by 18 women

$$= 15 \times 24/18 = 20 \text{ days}$$

∴ Required ratio = 1/14 : 1/20

$$= 20 : 14 = 10 : 7$$

32.(1) 24 men complete 1 work in 18 days.

What part of work will 27 men do in 8 days?

$$= M_1 D_1 / W_2 = M_2 D_2 / W_2$$

$$= (24 \times 18) / 1 = (27 \times 8) / W_2$$

$$= W_2 = (27 \times 8) / (24 \times 18) = 1/2$$

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

This part of work is to be done by 14 women.

$$\therefore M_1 D_1 / W_2 = M_2 D_2 / W_2$$

$$= (12 \times 28) / 1 = (14 D_2) / 1/2$$

$$= 14 \times D_2 = 1/2 \times 12 \times 28$$

$$= D_2 = (6 \times 28) / 14 = 12 \text{ days}$$

33.(5) Work done by 15 men in 9 days = W_2 (let)

$$= \therefore M_1 D_1 / W_2 = M_2 D_2 / W_2$$

$$= (16 \times 36) / 1 = (18 \times D_2) / (3/4)$$

$$= 18 \times D_2 = 3/4 \times 16 \times 36$$

$$= 27 \times 16$$

$$= D_2 = (27 \times 16) / 18 = 24 \text{ days}$$

34.(3) Work done by 8 women in 18 days = W_2 (let)

$$= M_1 D_1 / W_2 = M_2 D_2 / W_2$$

$$= 12 \times 16 / 1 = (8 \times 18) / W_2$$

$$W_2 = (8 \times 18) / (12 \times 16) = 3/4$$

∴ Remaining work

$$= 1 - 3/4 = 1/4$$

This part of work was done by 12 women.

∴ Time taken by them

$$= 4 \text{ days}$$

∴ Required time = 18 + 4

$$= 22 \text{ days}$$

35.(1) According to the question,

$$= (15 \times 6) \text{ men} + (16 \times 6) \text{ women}$$



$$\begin{aligned}
&= (12 \times 32) \text{ women} \\
&= 90 \text{ men} + 96 \text{ women} \\
&= 384 \text{ women} \\
&= 90 \text{ women} = (384 - 96) \text{ women} \\
&= 288 \text{ women} \\
&= 10 \text{ men} = 32 \text{ women} \\
\therefore &= M_1 D_1 = M_2 D_2
\end{aligned}$$

$$36.(2) \quad 2 \text{ men} = 1 \text{ women}^3$$

$$\begin{aligned}
&= 1 \text{ man} = \frac{1}{2} \text{ women} \\
&= 3 \text{ men} = \frac{3}{2} \text{ women} \\
\text{Again, } &2 \text{ children} = 1 \text{ man} \\
&= \frac{1}{2} \text{ woman} \\
&= 1 \text{ child} = \frac{1}{4} \text{ woman} \\
&= 6 \text{ children} = \frac{6}{4} = \frac{3}{2} \text{ women}
\end{aligned}$$

$$\begin{aligned}
\text{Now, three men, four women and six children} \\
&= \frac{3}{2} + 4 + \frac{3}{2} = 7 \text{ women}
\end{aligned}$$

Hence, 7 women complete the work in 7 days.

$$37.(2) \quad \text{In 36 days, 12 men can do 1 complete work.}$$

& In 36 days, 12 women can do $\frac{3}{4}$ th. of the work

Since time and the no. of persons is the same in both cases.

$$\begin{aligned}
1 \text{ woman's daily work} &= \frac{3}{4} \text{th. of 1 man's daily work} \\
8 \text{ women's daily work} &= \frac{3}{4} \times 8 = 6 \text{ men's daily work}
\end{aligned}$$

$$\begin{aligned}
&= (10 \text{ men} + 8 \text{ women daily work}) \\
&= (10 \text{ men} + 6 \text{ men})
\end{aligned}$$

$$= 16 \text{ men's daily work.}$$

$$12 \text{ men can do the work in 36 days}$$

$$\begin{aligned}
\therefore 16 \text{ men can do the work in} \\
&= 36 \times \frac{12}{16} = 27 \text{ days}
\end{aligned}$$

$$38.(3) \quad A's \text{ 1 day's work} = \frac{1}{12}$$

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

$$\begin{aligned}
\therefore B's \text{ 1 day's work} \\
&= \frac{1}{8} - \frac{1}{12} = \frac{(3 - 2)}{24} = \frac{1}{24}
\end{aligned}$$

$$\therefore B \text{ alone can do the work in 24 days.}$$

$$39.(5) \quad \text{Days} \quad \text{Men}$$

Days	Men
10 ↑	12 ↓
8 ↑	x ↓

Where x = number of men

$$\therefore 8 : 10 :: 12 : x$$

$$= 8 \times x = 10 \times 12$$

$$= x = \frac{(10 \times 12)}{8} = 15$$

$$40.(5) \quad (A + B)'s \text{ 1 day's work} = \frac{1}{T}$$

$$A's \text{ 1 day's work} = \frac{1}{(T + 3)}$$

$$B's \text{ 1 day's work} = \frac{1}{(T + 12)}$$

$$\therefore \frac{1}{(T + 3)} + \frac{1}{(T + 12)}$$

$$= \frac{(T + 12 + T + 3)}{(T + 3)(T + 12)}$$

$$= \frac{1}{T}$$

$$= \frac{(2T + 15)}{(T^2 + 15T + 36)}$$

$$= T^2 = 36$$

$$= T = 6 \text{ days}$$

$$41.(1) \quad [\text{Tricky Approach}]$$

$$4 \times 2 \text{ men} = 4 \times 4 \text{ women} = 20 \text{ children}$$

$$= 2 \text{ men} = 4 \text{ women} = 5 \text{ children}$$

$$\therefore 2 \text{ men} + 4 \text{ women} + 10 \text{ children}$$

$$= 20 \text{ children}$$

$$= M_1 D_1 = M_2 D_2$$

$$= 5 \times 4 = 20 \times D_2$$

$$= D_2 = 1 \text{ day}$$

$$42.(3) \quad \text{Let Amit's speed be } x \text{ key depressions per day}$$

$$\therefore \text{Sujit's speed} = \frac{4x}{5} \text{ key depressions per day}$$

$$\therefore 5x + 5 \times \frac{4x}{5} = 576000$$

$$= 9x = 576000$$

$$= x = \frac{576000}{9} = 64000$$

$$\therefore \text{Amit's speed per hour}$$

$$= \frac{64000}{8} = 8000$$

$$43.(3) \quad \text{Time taken by Shruti in doing the work} = 10 \text{ days}$$

The efficiency of Harish is twice to that of Shruti

$$\therefore \text{Time taken by Harish} = 5 \text{ days}$$

$$\text{Time taken by Shankar}$$

$$= 15 \text{ days}$$

$$\therefore \text{Work done by all these in 1 day}$$

$$= \frac{1}{10} + \frac{1}{5} + \frac{1}{15}$$

$$= \frac{(3 + 6 + 2)}{30}$$

$$= \frac{11}{30}$$

Hence, the work will be finished in $\frac{30}{11}$ days

$$44.(1) \quad B \text{ is } 25\% \text{ more efficient than } C.$$

$$\therefore \text{Ratio of time taken by } B \text{ and } C$$

$$= 100 : 125$$

$$= 4 : 5$$

$$\text{Time taken by } B = 4x \text{ days}$$

$$\text{Time taken by } C = 5x \text{ days}$$

$$\therefore \frac{1}{4x} + \frac{1}{5x} = \frac{3}{40}$$

$$= \frac{(5 + 4)}{20x} = \frac{3}{40}$$

$$= \frac{3}{x} = \frac{1}{2}$$

$$= x = 6$$

$$\text{Time taken by } B = 24 \text{ days}$$

$$\text{Time taken by } C = 30 \text{ days}$$

If the time taken by A be y days, then

$$\frac{1}{y} + \frac{1}{24} = \frac{7}{72}$$

$$= \frac{1}{y} = \frac{7}{72} - \frac{1}{24} = \frac{(7 - 3)}{72}$$

$$= \frac{4}{72} = \frac{1}{18}$$

$$\therefore y = 18$$

$$\therefore (A + C)'s \text{ 1 day's work}$$

$$= \frac{1}{18} + \frac{1}{30} = \frac{(5 + 3)}{90}$$

$$= \frac{8}{90} = \frac{4}{45}$$

$$\therefore \text{Time taken by } A \text{ and } C \text{ together}$$

$$= \frac{45}{4} \text{ days}$$

$$45.(2) \quad 10 \times 15 \text{ men}$$

$$= 8 \times 25 \text{ women}$$

$$= 3 \text{ men} = 4 \text{ women}$$

$$3 \text{ men} = 4 \text{ women}$$

$$= (10 + 4) \text{ women} = 14 \text{ women}$$

$$8 \text{ women's 1 day's work}$$



$= 1/25$
 \therefore 10 women's 1 day's work
 $= 10/25 \times 8 = 1/20$ part
 $\therefore M_1D_1/W_2 = M_2D_2/W_2$
 $= (10 \times 20)/W_1 = (14 \times 5)/W_2$
 $W_2 = (14 \times 5)/(10 \times 20) = 7/20$ part
 Remaining work $= 1 - 7/20$
 $= 13/20$
 \therefore This part of work is done by 10 women.
 \therefore Required time
 $= 13/20 \times 20 = 13$ days.

46.(3) Remaining work
 $= 1 - 5/9 = 4/9$
 $\therefore M_1D_1/W_2 = M_2D_2/W_2$
 $= M_2 \times 8 \times 5 = 16 \times 30 \times 4$
 $= M_2 = (16 \times 30 \times 4)/(8 \times 5) = 48$
 \therefore Additional men $= 48 - 16 = 32$

47.(1)
 $\begin{array}{ccc} 9 \uparrow & 7 \uparrow & 15 \downarrow \\ 6 & 9 & x \end{array}$
 Where $x =$ number of days

$\therefore \left. \begin{array}{l} 6:9 \\ 9:7 \end{array} \right\} :: 15:x$

$= 6 \times 9 \times X = 9 \times 7 \times 15$
 $= X = 9 \times 7 \times 15/(6 \times 9)$
 $= 35/2$ Days

48.(2) 12 boys = 15 girls
 $= 24$ boys = 30 girls
 \therefore 24 boys + 6 girls
 $= 36$ girls
 $M_1D_1/W_2 = M_2D_2/W_2$
 $= 15 \times 48/18 = 40$ days

49.(2) Page printed in one minute
 $= 1/8 + 1/18 + 1/24$
 $= (9 + 4 + 3)/72 = 16/72 = 2/9$
 \therefore Time taken $= 368 \times 2/9$
 $= 1656$ minutes $= 27.6$ hours

50.(5) According to the question,
 (18×10) men $= (16 \times 12)$ women
 $= 15$ men $= 16$ women
 8 women $= 6$ men
 $= (15/2 + 6)$
 $= (15 + 12)/2$
 $= 27/2$ men
 \therefore 18 men do the work in 10 days.
 $\therefore M_1D_1/W_2 = M_2D_2/W_2$
 $= (18 \times 10)/1 = 27/2 \times 80/(9 \times W_2)$
 $= 180 = 120/W_2$
 $W_2 = 120/180 = 2/3$
 Remaining work $= 1 - 2/3 = 1/3$
 $=$ Work done by 8 men
 $\therefore M_1D_1/W_2 = M_2D_2/W_2$

$= (18 \times 10)/1 = (8 \times D_2)/(1/3)$
 $= 24D_2$
 $= 180$
 $= D_2 = 180/24$
 $= 15/2$ days

51.(1) man will complete the work in $= 6 \times 12 = 72$ days
 1 woman will complete the work in $= 8 \times 18 = 114$ days
 1 child will complete the work in
 $= 18 \times 10 = 180$ days
 4 men + 12 women + 20 children's 2 days' work
 $= 2(4/72 + 12/144 + 20/180)$
 $= 2(1/18 + 1/12 + 1/9)$
 $= 2(2 + 3 + 4)/36 = 1/2$
 \therefore Remaining work $= 1/2$
 \therefore Required number of men
 $= 72 \times 1/2 = 36$

52.(5) According to the question, A's one day work $= 1/4$
 B's one day work $= 1/8$
 (A + B)'s one day work
 $= 1/4 + 1/8 = 3/8$

Similarly,
 (A + B + C)'s one day work $= 7/16$
 \therefore C's one day work
 $= 7/16 - 3/8 = 1/16$

Therefore, C can complete the whole work in 16 days
53.(4) P can complete a work in 12 days working 8 hours a day

\therefore P can do a work in 12 days working 1 hours a day $= 1/8$

\therefore P's 1 day work working 1 hour a day $= 1/8$
 \therefore P's 1 day work working 1 hour a day $= 1/(8 \times 12)$
 Similarly, Q's 1 day work working 1 hour a day

$= 1/(8 \times 10)$
 \therefore (P + Q)'s 1 day working 1 hour a day
 $= 1/(8 \times 12) + 1/(8 \times 10)$

$= (5 + 6)/(60 \times 8) = 11/(60 \times 8)$
 \therefore (P + Q)'s 1 day work working 8 hours a day
 $= (11 \times 8)/(60 \times 8) = 11/60$
 \therefore No. of days required
 $= 60/11$ days

Therefore, C can complete the whole work in 16 days.

54.(2) Let the man worked overtime for x hours.

Basic pay of 40 hours
 $=$ Rs. 200
 \therefore Basic pay of 1 hour $= 200/40$
 $=$ Rs. 5

According to the question,
 $= 200 + x \times (5 \times 125)/100 = 300$
 $= 25/4x = 300 - 200$
 $= x = (100 \times 4)/25 = 16$
 \therefore Total hours of work
 $= (40 + 16) = 56$

