Mixed Proportion

Solution

1. **Answer: (E)**
Let the original number of men was m.
∴ 60m = 96(m – 18)
m = 48

2. **Answer: (D)**
Let the number of men = p
Then p men do the work in 80 days.
Now (p – 15) men do the work in (80 + 16) = 96 days
Thus, p × 80 = (p – 15) × 96
80p = 96p – 1440
16p = 1440
p = 90 men
Hence initially there were 90 men.

3. **Answer: (C)**
1 day work of 16 boys = 1/20 part
1 day work of 1 boy = 1/(16 × 20) = 1/320 part
Similarly, 1 day work of 1 man = 1/(9 × 20) = 1/180
1 day work of 8 boys = 8/320 = 1/40
1 day work of 10 men = 10/180 = 1/18
Therefore, 10 men and 8 boys together will take = 1/40 + 1/18
= > 12 12/29 days

4. **Answer: (B)**
Let t = days taken by second group
2 × 30 × 4 × 10 = 45 × 8 × t
T = $6\frac{2}{3}$ days.

5. **Answer: (D)**
Let the efficiency of 1 man be M unit/day and that of 1 woman be W unit/day
ATQ,
40 × 12 × M = 12 × 48 × W.
$\Rightarrow \frac{M}{W} = \frac{6}{5}$
Let total work = 40 × 12 × 6 = 2880 units.
In 4 days, work done by men = (40 × 6 + 30 × 6 + 20 × 6 + 10 × 6) = 600 units.
On 5th day no men will be remaining and all the remaining work will be completed by womens
Remaining work = 2880 units.
Required time = $\frac{2280}{16 \times 5} = 28\,{}^{1}/_{2}\,days.$

6. **Answer: (C)**
Let the efficiency of one men be M unit/day
One woman be W unit/day and that of one child be C unit/day
ATQ,
12 × 10 × M = 15 × 12 × W = 20 × 15 × C
⇒ 2M = 3W = 5C
Total work = 12 × 10 × M = 120M units.
In 5 days, work done by men
= (12 × 5 × M) = 60 M units.
Remaining work = 60M units
Required number of men = $\frac{60M}{5} = 12M$
9W = 6M
Remaining man required = 12M − 6M
2M = 5C = 6M = 15C

7. **Answer: (B)**
$(10m + 15w)8 = (12m + 8w)10$
$80m + 120w = 120m + 80w$
$40m = 40w$
And, m = w 2b
$2m + 4w + 18b \rightarrow 2m + 4m + 9m \rightarrow 15m$
$15m \times x = 25m \times 8$
$x = \frac{40}{3}$

8. **Answer: (D)**
20 men can complete the work in 12 days.
So, 1 man can complete the same work in 240 days.
Efficiency of 5 woman = Efficiency of 3 man
5W = 3M
Ratio of efficiency:
$\frac{M}{W} = \frac{5}{3}$

Let, a man does 5 units and a woman does 3 units of work per day & total units of work are 1200 units.
8 days' work of 4 men and 10 women
$= 8 \times (4 \times 5 + 10 \times 3) = 400\ units$
Remaining work = $1200 - 400 = 800$ units
Quantity I:
Let the additional number of women required be x.
There are 4 men and 10 + x women now.
Per day work of 4 men and 10 + x women
$= 4 \times 5 + (10 + x) \times 3$
$= 50 + 3x\ units$
No. of day required to complete the remaining work
$= \frac{800}{50 + 3x}$
$\frac{800}{50 + 3x} = 10$
$x = 10$
10 additional women are required to complete the remaining work in 10 days.
Quantity II:
Let the additional number of men required be y.
There are 4 + y men and 10 women now.
Per day work of 4 + y men and 10 women
$= (4 + y) \times 5 + 10 \times 3 = 50 + 5y\ units$
No. of day required to complete the remaining work = $\frac{800}{50 + 5y}$
$\frac{800}{50 + 5y} \leq 8$
$y \geq 10$
At least 10 additional men are required to complete the remaining work in either 8 or less than 8 days.
Quantity II ≥ Quantity I

9. Answer: (A)
Solider = 56 × 1 × 24 days
Required time = $\frac{56 \times 24}{42} = 32\ days$

10. Answer: (B)
Let the efficiency of a man be m units/day and efficiency of a woman be w units/day
ATQ
$(8m + 10w) \times 15 = (10m + 18w) \times 10$
$\frac{m}{w} = \frac{3}{2}$
Total work = $(8 \times 3 + 10 \times 2) \times 15$
$= 660\ units$
Work done in 10 days = $(4 \times 3 + 5 \times 2) \times 10$
$= 220\ units$
Let the number of more woman required be x
Then $2 \times (5 + x) \times 11 = 440$
$x = 15$

11. Answer: (B)
Ratio of efficiency = 5 × 5/6 : 6
= 25 : 36
Let a man can finish the work in 25x days
A woman can finish the work in 36x days
$\frac{9}{36x} + \frac{10}{25x} = \frac{13}{40}$
Time taken by 1 woman = 72 days
No. of woman required to complete the Work in 4.5 days = $\frac{72}{4.5}$ = 16

12. Answer: (E)
Let x men do the work in (a – 6) days
And y women do the work in a days
So,
x(a – 6) = y (a)
From (i)
Let x = 5p
And y = 6p
5p (a – 6) = 6p(a)
a = – 30 not possible
From (ii),
10p(a – 6) = 3p(a)
7a = 60
$a = \frac{60}{7}$ it is possible
From (iii)
8p (a – 6) = 5p(a)
8a – 48 = 5a
3a = 48
a = 16 possible

13. Answer: (D)
Let p men can do the task in (d – 2) days
And q boys can do the task in d days

Ratio of efficiency of man to boy = 3 : 1

$3p(d-2) = 1 \times q \times d$

Now value of d should be positive to satisfy the question.

From (i)

Let, p = a

q = 2a

$3a(d-2) = 2a\,(d)$

d = 6, it is possible

From (ii)

Let, p = 2x

q = 5x

$3 \times 2x(d-2) = 5x\,(d)$

$6d - 12 = 5d$

d = 12, it is possible

From (iii)

Let, p = 2b

q = 3b

$3 \times 2b(d-2) = 3b(d)$

6d − 12 = 3d

d = 4, it is possible

From (iv)

Let, p = 16e

q = 35e

$3 \times 16e(d-2) = 35e(d)$

$48d - 96 = 35d$

13d = 96

$d = \frac{96}{13}$, it is possible

14. Answer: (A)

Quantity I:

1 men = 2 women

∴ 8 men + 4 women = 20 women

4 men + 8 women = 16 women

20 women's 2 days' works = $\frac{2}{6} = \frac{1}{3} part$

Remaining work = $1 - \frac{1}{3} = \frac{2}{3}$

∵ 20 women complete 1 work in 6 days

∴ 16 women will do $\frac{2}{3}$ work in

$\frac{20 \times 6}{16} \times \frac{2}{3} = 5\ days$

Quantity II: 5 days

⇒ Quantity I = Quantity II

15. Answer: (D)

2 boys = 1 man

Hence; 12 men and 16 boys = 12 + 8 = 20 men

So total man hours to build the house = 20 X 8 X 40 = 6400 man hours.

The second house is twice as large so it will require 12800 man hours.

Let the number of boys required = 2n; hence total number of men = 21 + n

(21 + n) X 9 X 50 = 12800

=> 21 + n = 28.44 ≈ 28.5

=> n = 7.5

Hence total number of boys = 2n = 15

16. Answer: (C)

Let the work doing capacity of one man be M.

Number of persons × work doing capacity of one person × number of days = amount of work done

=> 20 × M × 12 = 4/5

=> M = (4/5)/ 20 × 12

=> M = 1/ 300

Let the number of persons added = x

Work remaining = 1 – 4/5 = 1/5

=> (20 + x) × M × 1.5 = 1/5

=> (20 + x) × (1/300) × 1.5 = 1/5

=> (20 + x) × (1/300) × 1.5 = 1/5

=> (20 + x) × (1/300) × 1.5 = 1/5

=> X = 20 more persons.

17. Answer: (B)

Let 1 worker completes the work in 'n' days

Then,

Work done by 10 workers in 1 day = 10/n

April = 30 days

2/3rd month = 20 days

=> 20 × 10/n = (100 – 175/3)/100

=> n = 20000 × 3/125

=> n = 480

So, 1 worker alone can complete the work in 480 days.

If 'y' more workers are employed for 10 days as the work is to be completed in 30 days, then,

=> (10 + y) × 10/480 = 175/300

=> y = 18

So, 18 more workers are employed, and wage of 1 worker is Rs.625.
So, wage given to extra workers employed
= 18 × 625 × 10 = Rs.112500

18. Answer: (E)

Let number of men in first group is 'x + 1' and number of men in second group is 'x'.
Number of women in first group = 12 – (x + 1) = (11 – x)
Number of women in second group = (10 – x)
Let 1 man does 'M' unit and 1 women does 'W' unit of work in 1 day.
Total work = 26 × (2M + 6W) = 13 × [(x + 1) × M + (11 – x) × W] = 16 × [x × M + (10 – x) × W]
Now, 26 × (2M + 6W) = 13 × [(x + 1) × M + (11 – x) × W]
52M + 156W = 13xM + 13M + 143W – 13xW
39M + 13W = 13x(M – W)
3M + W = x(M – W) ..... (1)
also,
26 × (2M + 6W) = 16 × [x × M + (10 – x) × W]
52M + 156W = 16xM + 160W – 16xW
52M – 4W = 16x(M – W) ..... (2)
From (1) and (2) –
= > 52M – 4W = 16 × (3M + W)
= > 52M – 4W = 48M + 16W
= > 4M = 20W
= > M: W = 5: 1

19. Answer: (A)

Let a man alone clears the forest in 'n' days
a man alone clears a forest = 1/n, in one day
Then a woman in 1 day alone clears = 0.75/n
In 5 days, part of forest cleared
= 5 × (3/n + 4 × 0.75/n) = 30/n
Remaining forest = 1 – 30/n
In next 12 days, forest cleared
= 12 × (5/n + 5 × 0.75/n) = 105/n
Remaining forest left to be cleared
= 1 – 30/n – 105/n = 1/10
9/10 = 135/n
1/n = 1/150
So, n = 150 days
a woman alone does work in = n/0.75
= 200 days
And, Let the number of trees in forest = M trees
M/10 = 50
M = 500 trees
So,
Work done by 3 men and 2 women in a day
= 3/150 + 2/200 = 3/100
Trees cut = 3 × 500/100 = 15 trees in a day.

20. Answer: (E)

Remaining time = 104-13 = 91 days
Present number of militants = 900
Let the number of coming militants be x.
Then total militants = 900 + x
If x militants would not come, 900 militants would eat the remaining ration at a rate of 750 gram per militant in 91 days
Let 900 + x militants eat the remaining ration at the rate of 1170 grams per militant in 35 days.
Therefore,(900 × 750 × 91)
= (900 + x) × 1170 × 35
900 + x = 1500
X = 600
Hence, the number of militants who joined later are 600.