CHAPTER

12 Time and Work

Section I — Basic Concept of Time and Work

1. 36 men together can build a wall 140 m long in 21 days; the number, of men working at the same rate required to build the same wall in 14 days is

[SSC CGL Prelim Exam. 2016]

(a) 54 (b) 48

(c) 36 (d) 18

Explanation: Here, $W_1 = W_2 = 140$

$$M_1 = 36, M_2 = ?$$

$$D_1 = 21, D_2 = 14$$

$\because$ $\dfrac{W_1}{M_1 D_1} = \dfrac{W_2}{M_2 D_2}$

$\Rightarrow$ $\dfrac{140}{36 \times 21} = \dfrac{140}{M_2 \times 14}$

$\Rightarrow$ $M_2 = \dfrac{36 \times 21}{14} = 54$

Hence, the correct option is (a).

2. If 20 women can lay a road of length 100 m in. 10 days. Then 10 women can lay the same road of length 50 m in

[SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015]

(a) 20 days

(b) 15 days

(c) 5 days

(d) 10 days

Explanation:

Women	Length	Days
20 ↑	100 ↓	10 ↓
10	50	x

$\therefore$ $\left.\begin{matrix} 10 : 20 \\ 100 : 50 \end{matrix}\right\} :: 10 : x$

$\Rightarrow$ $10 \times 100 \times x = 20 \times 50 \times 10$

$\Rightarrow$ $x = \dfrac{20 \times 50 \times 10}{1000} = 10$ days

Hence, the correct option is (d).

3. A, B and C can complete a piece of work in 24, 5 and 12 days respectively. Working together, they will complete the same work in

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015)

(a) $\dfrac{7}{24}$ days (b) $3\dfrac{1}{13}$ days

(c) 4 days (d) $\dfrac{1}{24}$ days

Explanation: A's 1 day work = $\dfrac{1}{24}$

B's 1 day work = $\dfrac{1}{5}$

C's 1 day work = $\dfrac{1}{12}$

$\therefore$ (A + B + C)'s 1 day work

$$= \frac{1}{24} + \frac{1}{5} + \frac{1}{12}$$

$$= \frac{5 + 24 + 10}{120}$$

$$= \frac{39}{120} = \frac{13}{40}$$

$\therefore$ Required time

$$= \frac{40}{13} = 3\frac{1}{13}$$

Hence, the correct option is (b).

4. A, B and C can complete a work in 10, 12 and 15 days respectively. A left the work 5 days before the work was completed and B left 2 days after A had left. The number of days required to complete the whole work is

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015)

(a) $8\dfrac{2}{3}$ (b) $6\dfrac{2}{3}$

(c) 7 (d) 6

Explanation: Let the whole work be completed in x days.

A's 1 day work = $\dfrac{1}{10}$

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

C's 1 day work = $\dfrac{1}{15}$

According to the question, A's $(x - 5)$ days work + B's $(x - 3)$ days work + C's x days works = 1

$\Rightarrow$ $\dfrac{x-5}{10} + \dfrac{x-3}{12} + \dfrac{x}{15} = 1$

$\Rightarrow$ $\dfrac{6(x-5) + 5(x-3) + 4x}{60} = 1$

$\Rightarrow$ $6x = 30 + 5x - 15 + 4x = 60$

$\Rightarrow$ $15x - 45 = 60$

$\Rightarrow$ $15x = 60 + 45 = 105$

$\Rightarrow$ $x = \dfrac{105}{15} = 7$ days

Hence, the correct option is (c).

5. A and B can do a piece of work in 15 days. B and C can do the same work in 10 days and A and C can do the same in 12 days. Time taken by A, B and C together to do the job is

[SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015]

(a) 4 days (b) 9 days

(c) 8 days (d) 5 days

Explanation: 59. (A + B)'s 1 day work = $\dfrac{1}{15}$

(B + C)'s 1 day work = $\dfrac{1}{10}$

(A + C)'s 1 day work = $\dfrac{1}{12}$

On adding all three,

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

$$= \frac{1}{15} + \frac{1}{10} + \frac{1}{12} = \frac{4+6+5}{60}$$

$$= \frac{15}{60} = \frac{1}{4}$$

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

$\therefore$ Required time = 8 days

Hence, the correct option is (c).

6. *A, B* and *C* can do a work separately in 16, 32 and 48 days respectively. They started the work together but *B* left off 8 days and *C* six days before the completion of the work. In what time is the work finished? **(SSC CGL Tier-II Exam, 2015)**

(a) 10 days (b) 9 days

(c) 12 days (d) 14 days

Explanation: Let the work be completed in x days.

According to the question,

$$\frac{x}{16} + \frac{x-8}{32} + \frac{x-6}{48} = 1$$

$$\Rightarrow \quad \frac{6x + 3x - 24 + 2x - 12}{96} = 1$$

$$\Rightarrow \quad 11x - 36 = 96$$

$$\Rightarrow \quad 11x = 96 + 36 = 132$$

$$\Rightarrow \quad x = \frac{132}{11} = 12 \text{ days}$$

Hence, the correct option is (c).

7. If 90 men can do a certain job in 16 days, working 12 hours per day, then the part of that work which can be completed by 70 men in 24 days, working 8 hours per day is **(SSC CGL Tier-II Exam, 2015)**

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$

(c) $\frac{7}{9}$ (d) $\frac{5}{8}$

Explanation:

$$\frac{M_1 D_1 T_1}{W_1} = \frac{M_2 D_2 T_2}{W_2}$$

$$\Rightarrow \quad \frac{90 \times 16 \times 12}{1} = \frac{70 \times 24 \times 8}{W_2}$$

$$\Rightarrow \quad W_2 = \frac{70 \times 24 \times 8}{90 \times 16 \times 12} = \frac{7}{9} \text{ parts}$$

Hence, the correct option is (c).

8. *A* and *B* can do a given piece of work in 8 days, *B* and *C* can do the same work in 12 days and *A, B, C* complete it in 6 days. The number of days required to finish the work by *A* and *C* is **(SSC CGL Tier-II Exam, 2015)**

(a) 16 (b) 8

(c) 12 (d) 24

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

$(B + C)$'s 1 daywork $= \frac{1}{12}$

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

$\therefore$ C's 1 day work $= \frac{1}{6} - \frac{1}{8}$

$$= \frac{4-3}{24} = \frac{1}{24}$$

A's 1 day work

$$= \frac{1}{6} - \frac{1}{12} = \frac{2-1}{12} = \frac{1}{12}$$

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

$$= \frac{1}{12} + \frac{1}{24} = \frac{2+1}{24} = \frac{1}{8}$$

$\therefore$ Required time = 8 days

Hence, the correct option is (b).

9. 16 men are able to complete a piece of work in 12 days working 14 hours a day. How long will 28 men, working 12 hours a day, take to complete the work? **[SSC Constable (GD) Exam, 2015]**

(a) 10 days (b) 7 days

(c) 8 days (d) 6 days

Explanation:

Men	Working hours	Days
16 ↑	14 ↑	12 ↓
28 ↑	12 ↑	x ↓

$\therefore$ $\left.\begin{matrix} 28:16 \\ 12:14 \end{matrix}\right\} :: 12 : x$

$$\Rightarrow \quad 28 \times 12 \times x = 16 \times 14 \times 12$$

$$\Rightarrow \quad x = \frac{16 \times 14 \times 12}{28 \times 12} = 8 \text{ days}$$

Hence, the correct option is (c).

10. *A*'s 2 days work is equal to *B*'s 3 days work. If *A* can complete the work in 8 days then to complete the work *B* will take **(SSC CGL Tier-I Exam. 2015)**

(a) 14 days (b) 12 days

(c) 15 days (d) 16 days

Explanation: *A*'s 2 days work = *B*'s 3 days work

$\therefore$ Time taken by $A = 8$ days

$\therefore$ Time taken by $B = \frac{8}{2} \times 3$

$= 12$ days

Hence, the correct option is (b).

11. *A* and *B* together can do a piece of work in 6 days. If *A* can alone do the work in 18 days, then the number of days required for *B* to finish the work is **(SSC CGL Tier-I Exam, 2015)**

(a) 10 (b) 12

(c) 9 (d) 15

Explanation: $(A + B)$'s 1 day work $= \frac{1}{6}$

A's 1 day work $= \frac{1}{18}$

$\therefore$ B's 1 day work $= \frac{1}{6} - \frac{1}{18}$

$$= \frac{3-1}{18} = \frac{2}{18} = \frac{1}{9}$$

$\therefore$ Required time = 9 days

Hence, the correct option is (c).

12. *A* can do a piece of work in 25 days and *B* can do the same work in 30 days. They work together for 5 days, how much of work is left? **(SSC CAPFs SI, CISF ASI & DP SI Exam, 2015)**

(a) $\frac{11}{30}$ (b) $\frac{15}{30}$

(c) $\frac{19}{30}$ (d) $\frac{12}{30}$

Explanation: $(A + B)$'s 1 day work

$$= \frac{1}{25} + \frac{1}{30} = \frac{6+5}{150} = \frac{11}{150}$$

$\therefore$ $(A + B)$'s 5 days work

$$= \frac{5 \times 11}{150} = \frac{11}{30}$$

$\therefore$ Remaining work

$$= 1 - \frac{11}{30} = \frac{30-11}{30} = \frac{19}{30}$$

Hence, the correct option is (c).

13. *A* and *B* can do a piece of work in 15 days. *B* and *C* can do a similar work in 12 days and *C* and *A* in 10 days. How many days will *A* take to do the work by himself? **(SSC CGL Tier-II Exam. 2014 & 2015)**

(a) 13 (b) 24
(c) 40 (d) 8

Explanation: $(A + B)$'s 1 day work

$$= \frac{1}{15} \quad \text{(i)}$$

$(B + C)$'s 1 day work

$$= \frac{1}{12} \quad \text{(ii)}$$

$(C + A)$'s 1 day work

$$= \frac{1}{10} \quad \text{(iii)}$$

On adding all three equations,
$2\,(A + B + C)$'s 1 day work

$$= \frac{1}{15} + \frac{1}{12} + \frac{1}{10}$$

$$= \frac{4+5+6}{60} = \frac{15}{60} = \frac{1}{4}$$

$\therefore$ $(A + B + C)$'s 1 day work

$$= \frac{1}{8} \quad \text{(iv)}$$

By equation (iv) – (ii)
A's 1 day work

$$= \frac{1}{8} - \frac{1}{12}$$

$$= \frac{3-2}{24} = \frac{1}{24}$$

$\therefore$ Required time = 24 days
Hence, the correct option is (b).

14. x can copy 80 pages in 20 hours, x and y together can copy 135 pages in 27 hours. Then y can copy 20 pages in
(SSC CGL Tier-II Exam. 2015)
(a) 20 hours (b) 3 hours
(c) 24 hours (d) 12 hours

Explanation: Number of pages copied by x in a hour $= \frac{80}{20} = 4$

Number of pages copied by x and y in 1 hour $= \frac{135}{27} = 5$

$\therefore$ Number of pages copied by y in 1 hour $= 5 - 4 = 1$
$\therefore$ Required time = 20 hours.
Hence, the correct option is (a).

15. If x can finish a job in 4 hours and y can finish the same job in 8 hours independently, then they together will finish the job in **(SSC CGL Tier-II Exam. 2015)**
(a) 140 minutes (b) 160 minutes
(c) 120 minutes (d) 150 minutes

Explanation: (x and y)'s 1 hour work

$$= \frac{1}{4} + \frac{1}{8} = \frac{2+1}{8} = \frac{3}{8}$$

$\therefore$ Required time $= \frac{8}{3}$ hours

$$= \left(\frac{8}{3} \times 60\right) \text{ minutes}$$

$$= 160 \text{ minutes}$$

Hence, the correct option is (b).

16. 15 men take 20 days to complete a job working 8 hours a day. The number of hours a day should 20 men take to complete the job in 12 days is
(SSC CGL Tier-II Exam. 2014)
(a) 5 hours (b) 10 hours
(c) 15 hours (d) 18 hours

Explanation: $M_1\, D_1\, T_1 = M_2\, D_2\, T_2$

$$\Rightarrow \quad 15 \times 20 \times 8 = 20 \times 12 \times T_2$$

$$\Rightarrow \quad T_2 = \frac{15 \times 20 \times 8}{20 \times 12} = 10 \text{ hours}$$

Hence, the correct option is (b).

17. Raj and Ram working together do a piece of work in 10 days. Raj alone can do it in 12 days. Ram alone will do the work in **(SSC CGL Tier-II Exam. 2014)**
(a) 20 days (b) 40 days
(c) 50 days (d) 60 days

Explanation: (Raj + Ram)'s 1 day work

$$= \frac{1}{10}$$

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

$\therefore$ Ram's 1 day work

$$= \frac{1}{10} - \frac{1}{12} = \frac{6-5}{60} = \frac{1}{60}$$

$\therefore$ Required time = 60 days
Hence, the correct option is (d).

18. A and B working separately can do a piece of work in 9 and 15 days respectively. If they work for a day alternately, with A beginning, then the work will be completed in
(SSC CHSL DEO & LDC Exam. 2014)
(a) 10 days (b) 11 days
(c) 9 days (d) 12 days

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

B's 1 day work $= \frac{1}{15}$

Work done in first 2 days = A's 1 day work + B's 1 day work

$$= \frac{1}{9} + \frac{1}{15} = \frac{5+3}{45} = \frac{8}{45}$$

$\therefore$ Work done in first 10 days

$$= \frac{8 \times 5}{45} = \frac{8}{9}$$

Remaining work $= 1 - \frac{8}{9} = \frac{1}{9}$

Now, it is the turn of A for the eleventh day.
$\therefore$ Time taken by A in doing $\frac{1}{9}$

$$\text{Work} = \frac{1}{9} \times 9 = 1 \text{ day}$$

$\therefore$ Required time = 10 + 1 = 11 days
Hence, the correct option is (b).

19. How many men need to be employed to complete a job in 5 days, if 15 men can complete $\frac{1}{3}$ of the job in 7 days?
(SSC CHSL DEO Exam. 2014)
(a) 20 (b) 21
(c) 45 (d) 63

Explanation: 15 men complete $\frac{1}{3}$ work in 7 days.

$\therefore$ Time taken in doing 1 work

$$= 3 \times 7 = 21 \text{ days}$$

$$\therefore \quad M_1 D_1 = M_2 D_2$$

$$\Rightarrow \quad 15 \times 21 = M_2 \times 5$$

$$\Rightarrow \quad M_2 = \frac{15 \times 21}{5} = 63 \text{ days}$$

Hence, the correct option is (d).

20. A can do $\frac{1}{4}$ of a work in l0 days. B can do $\frac{1}{3}$ of the work in 20 days. In how many days can both A and B together do the work? **(SSC CGL Tier-I Exam. 2014)**
(a) 30 days (b) 32 days
(c) 24 days (d) 25 days

Explanation: A does $\frac{1}{4}$ work in 10 days.

$\therefore$ A will do 1 work in $10 \times 4 = 40$ days
Similarly, B will do the same work in $20 \times 3 = 60$ days

$\therefore$ ($A + B$)'s 1 day work

$$= \frac{1}{40} + \frac{1}{60}$$

$$= \frac{3+2}{120} = \frac{5}{120} = \frac{1}{24}$$

$\therefore$ Required time = 24 days

Hence, the correct option is (c).

21. A can do a piece of work in 4 days and B can do it in 12 days. In how many days will they finish the work, both working together? **(SSC CGL Tier-I Exam. 2014)**

(a) 4 days (b) 6 days

(c) 2 days (d) 3 days

Explanation: A's 1 day work = $\frac{1}{4}$

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

($A + B$)'s 1 day work

$$= \frac{1}{4} + \frac{1}{12}$$

$$= \frac{3+1}{12} = \frac{4}{12} = \frac{1}{3}$$

$\therefore$ Required time = 3 days

Hence, the correct option is (d).

22. A takes three times as long as B and C together to do a job. B takes four times as long as A and C together to do the work. If all the three, working together can complete the job in 24 days, then the number of days, A alone will take to finish the job is **(SSC CGL Tier-I Exam. 2014)**

(a) 100 (b) 96

(c) 95 (d) 90

Explanation: Time taken by B and C = x days (Assume)

$\therefore$ Time taken by $A = 3x$ days

$\therefore$ Part of work done by A, B and C in 1 day

$$= \frac{1}{x} + \frac{1}{3x} = \frac{3+1}{3x} = \frac{4}{3x}$$

$$\therefore \quad \frac{4}{3x} = \frac{1}{24}$$

$$\Rightarrow \quad 3x = 4 \times 24$$

$$\Rightarrow \quad x = \frac{4 \times 24}{3} = 32 \text{ days}$$

$\therefore$ Time taken by $A = 32 \times 3 = 96$ days

Hence, the correct option is (b).

23. Three men A, B and C working together can do a job in 6 hours less time than A alone, in 1 hour less time than B alone and in one half the time needed by C when working alone. Then A and B together can do the job in **(SSC CGL Tier-I Exam. 2014)**

(a) $\frac{2}{3}$ hour (b) $\frac{3}{4}$ hour

(c) $\frac{3}{2}$ hour (d) $\frac{4}{3}$ hour

Explanation: Let A, B and C together do the work in x hours.

$\therefore$ Time taken by $A = (x + 6)$ hours

Time taken by $B = (x + 1)$ hours

Time taken by $C = 2x$ hours

$$\therefore \quad \frac{1}{x+6} + \frac{1}{x+1} + \frac{1}{2x} = \frac{1}{x}$$

$$\frac{1}{x+6} + \frac{1}{x+1} = \frac{1}{x} - \frac{1}{2x}$$

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

$$\Rightarrow \quad \frac{1}{x+6} = \frac{1}{2x} - \frac{1}{x+1}$$

$$= \frac{x+1-2x}{2x(x+1)}$$

$$\Rightarrow \quad \frac{1}{x+6} = \frac{1-x}{2x^2+2x}$$

$$\Rightarrow \quad 2x^2 + 2x = x + 6 - x^2 - 6x$$

$$\Rightarrow \quad 3x^2 + 7x - 6 = 0$$

$$\Rightarrow \quad 3x^2 + 9x - 2x - 6 = 0$$

$$\Rightarrow \quad 3x(x+3) - 2(x+3) = 0$$

$$\Rightarrow \quad (3x-2)(x+3) = 0$$

$$\Rightarrow \quad 3x - 2 = 0 \text{ as } x + 3 \neq 0$$

$$\Rightarrow \quad x = \frac{2}{3}$$

$\therefore$ Time taken by $A = 6 + \frac{2}{3}$

$$= \frac{18+2}{3} = \frac{20}{3} \text{ hours}$$

Time taken by $B = 1 + \frac{2}{3} = \frac{5}{3}$ hours

$\therefore$ ($A + B$)'s 1 hour's work

$$= \frac{3}{20} + \frac{3}{5} = \frac{3+12}{20}$$

$$= \frac{15}{20} = \frac{3}{4}$$

$\therefore$ Required time = $\frac{4}{3}$ hours

Hence, the correct option is (d).

24. A can complete a work in 'm' days and B can complete it in 'n' days. How many days will it take to complete the work if both A and B work together? **(SSC CGL Tier-I Exam. 2014)**

(a) $(m + n)$ days (b) $\left(\frac{1}{m} \times \frac{1}{n}\right)$ days

(c) $\left(\frac{m+n}{mn}\right)$ days (d) $\left(\frac{mn}{m+n}\right)$ days

Explanation: A's 1 day work = $\frac{1}{m}$

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

$\therefore$ ($A + B$)'s 1 day's work

$$= \frac{1}{m} + \frac{1}{n}$$

$$= \frac{n+m}{mn} = \frac{m+n}{mn}$$

$\therefore$ Required time = $\frac{mn}{m+n}$

Hence, the correct option is (d).

25. A and B together can dig a trench in 12 days, which A alone can dig in 28 days; B alone can dig it in **(SSC CGL Tier-I Re-Exam. 2013 & 2014)**

(a) 20 days (b) 21 days

(c) 22 days (d) 23 days

Explanation: B's 1 day work = ($A + B$)'s 1 day work – A's 1 day work

$$= \frac{1}{12} - \frac{1}{28} = \frac{7-3}{84}$$

$$= \frac{4}{84} = \frac{1}{21}$$

$\therefore$ Required time = 21 days

Hence, the correct option is (b).

26. A can do a piece of work in 12 days and B in 15 days. They work together for 5 days and then B left. The days taken by A to finish the remaining work is **(SSC CGL Tier-I Re-Exam. 2013 & 2014)**

(a) 3 (b) 5

(c) 10 (d) 121

Explanation: Work done by A and B in 5 days

$$= 5\left(\frac{1}{2} + \frac{1}{15}\right) = 5\left(\frac{5+4}{60}\right)$$

$$= 5 \times \frac{9}{60} = \frac{9}{12} = \frac{3}{4}$$

Remaining work = $1-\frac{3}{4}=\frac{1}{4}$

$\therefore$ Time taken by A

$$=\frac{1}{4}\times 12=3 \text{ days}$$

Hence, the correct option is (a).

27. A can do a piece of work in 20 days and B can do the same piece of work in 30 days. Find in how many days both can do the work?

[(SSC Constable (GD) Exam. 2013) & (SSC CHSL DEO & LDC Exam. 2013)]

(a) 16 days (b) 14 days

(c) 10 days (d) 12 days

Explanation: A's 1 day work = $\frac{1}{20}$

B's 1 day work = $\frac{1}{30}$

$\therefore$ $(A + B)$'s 1 day work

$$=\frac{1}{20}+\frac{1}{30}=\frac{3+2}{60}=\frac{1}{12}$$

Hence, the work will be completed in 12 days when the work is done together.
Hence, the correct option is (d).

28. A can do as much work as B and C together can do. A and B can together do a piece of work in 9 hours 36 minutes and C can do it in 48 hours. The time (in hours) that B needs to do the work alone, is

(SSC CAPFs SI & CISF ASI Exam. 2013)

(a) 18 hours (b) 24 hours

(c) 30 hours (d) 12 hours

Explanation: 9 hours 36 minutes

$$=9+\frac{36}{60}=9\frac{3}{5}\text{ hours}=\frac{48}{5}\text{ hours}$$

$(A + B)$'s 1 hour's work = $\frac{5}{48}$

C's 1 hour's work = $\frac{1}{48}$

$(A + B + C)$'s 1 hour's work

$$=\frac{5}{48}+\frac{1}{48}=\frac{1}{8} \quad \text{(i)}$$

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

From equations (i) and (ii),

$$2\times 1\ A\text{'s 1 hour's work}=\frac{1}{8}$$

A's 1 hour's work = $\frac{1}{16}$

$\therefore$ B's 1 hour's work = $\frac{5}{48}-\frac{1}{16}$

$$=\frac{5-3}{48}=\frac{1}{24}$$

$\therefore$ B alone will finish the work in 24 hours.
Hence, the correct option is (b).

29. A and B can do a work in 12 days, B and C in 15 days and C and A in 20 days. If A, B and C work together, they will complete the work in

[(SSC CGL Prelim Exam. 1999) & (SSC CPO S.I, Exam. 2003 & 2008) & (SSC CGL Prelim Exam. 2011) (SSC CGL Tier-I Exam. 2013)]

(a) 5 days (b) $7\frac{5}{6}$ days

(c) 10 days (d) $15\frac{2}{3}$ days

Explanation: According to the question, A and B can do a work in 12 days.

$\therefore$ $(A + B)$'s one day work = $\frac{1}{2}$

Similarly,

$(B + C)$'s one day work = $\frac{1}{5}$ and $(C + A)$'s one day work = $\frac{1}{20}$

On adding all three,

$\therefore$ $2(A + B + C)$'s one day work

$$=\frac{1}{12}+\frac{1}{15}+\frac{1}{20}=\frac{10+8+6}{120}=\frac{1}{5}$$

$\Rightarrow$ $(A + B + C)$'s one day work

$$=\frac{1}{10}$$

$\therefore$ A, B and C together can finish the whole work in 10 days.
Hence, the correct option is (c).

30. A work can be completed by P and Q in 12 days, Q and R in 15 days, R and P in 20 days. In how many days P alone can finish the work?

[(SSC CGL Tier-I Exam 2011) & (SSC GGL Tier-I Exam. 2013)]

(a) 10 days (b) 20 days

(c) 30 days (d) 60 days

Explanation: $(P + Q)$'s 1 day work

$$\frac{1}{12} \quad \text{(i)}$$

$(Q + R)$'s 1 day work = $\frac{1}{15}$ (ii)

$(R + P)$'s 1 day work = $\frac{1}{20}$ (iii)

By adding all three equations,

$2(P + Q + R)$'s 1 day work

$$=\frac{1}{12}+\frac{1}{15}+\frac{1}{20}=\frac{5+4+3}{60}$$

$$=\frac{12}{60}=\frac{1}{5}$$

$\therefore$ P's 1 day work

$$=\frac{1}{10}-\frac{1}{15}=\frac{3-2}{30}=\frac{1}{30}$$

$\therefore$ P alone will complete the work in 30 days.
Hence, the correct option is (c).

31. Ronald and Elan are working on an assignment. Ronald takes 6 hours to type 32 pages on a computer, while Elan takes 5 hours to type 40 pages. How much time will they take working together on two different computers to type an assignment of 110 pages? **(SSC GL Tier-I Exam. 2013)**

(a) 7 hrs. 30 min. (b) 8 hrs.

(c) 8 hrs. 15 min. (d) 8 hrs. 25 min.

Explanation: Ronald's 1 hour work

$$=\frac{32}{6}=\frac{16}{3}\text{ pages}$$

Pages typed in 6 hours = 32

$\therefore$ Pages typed in 1 hour = $\frac{32}{6}$

Elan's 1 hour work = 8 pages 1 hour's work of the both

$$=\frac{16}{3}+8=\frac{40}{3}\text{ pages}$$

$\therefore$ Required time

$$=\frac{110\times 3}{40}=\frac{33}{4}=\text{hours}$$

= 8 hours 15 minutes

Hence, the correct option is (c).

32. A and B can separately do a piece of work in 6 days and 12 days respectively. How long will they together take to do the work?

(SSC GL Tier-I Exam. 2012)

(a) 9 days (b) 18 days

(c) 6 days (d) 4 days

Explanation: $(A + B)$'s 1 day work

$$=\frac{1}{6}+\frac{1}{12}=\frac{2+1}{12}=\frac{1}{4}$$

$\therefore$ A and B together will complete the work in 4 days.
Hence, the correct option is (d).

33. A and B can do a piece of work in 36 days, B and C can do it in 60 days, A and C can do it in 45 days. C alone can do it in

(SSC CHSL DEO & LDC Exam. 2012)

(a) 90 days (b) 180 days

(c) 120 days (d) 150 days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{36}$

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

$(C + A)$'s 1 day work $= \frac{1}{45}$

Adding all three,

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

$$= \frac{1}{36} + \frac{1}{60} + \frac{1}{45} = \frac{5+3+4}{180} = \frac{1}{15}$$

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

$\therefore$ C's 1 day work $= \frac{1}{3} - \frac{1}{36} = \frac{6-5}{180} = \frac{1}{180}$

Hence, C alone will finish the work in 180 days.

Hence, the correct option is (b).

34. A, B and C can complete a piece of work in 12, 24 and 36 days respectively. In how many days will they together complete the same work?

(SSC CHSL DEO & LDC Exam. 2012)

(a) $5\frac{6}{11}$ days (b) 4 days

(c) $6\frac{6}{11}$ days (d) 6 days

Explanation: $(A + B + C)$'s 1 day work

$$= \frac{1}{12} + \frac{1}{24} + \frac{1}{36}$$

$$= \frac{6+3+2}{72} = \frac{11}{72}$$

$\therefore (A + B + C)$ together will complete the work in $\frac{72}{11}$ days.

The fraction can be written as, which pertains to $6\frac{6}{11}$ days.

Hence, the correct option is (c).

35. A and B together can do a piece of work in 12 days, while B alone can finish it in 30 days. A alone can finish the work in

(SSC CHSL DEO & LDC Exam. 2012)

(a) 20 days (b) 25 days

(c) 15 days (d) 18 days

Explanation: A's 1 day work

$$= \frac{1}{12} - \frac{1}{30} = \frac{5-2}{60} = \frac{3}{60} = \frac{1}{20}$$

Hence, A alone will complete the work in 20 days.

Hence, the correct option is (a).

36. A, B, and C individually can do a work in 10 days, 12 days and 15 days respectively. If they start working together, then the number of days required to finish the work is

[SSC Constable (GD) & Rifleman (GD) Exam. 2012]

(a) 16 days (b) 8 days

(c) 4 days (d) 2 days

Explanation: Work done by A, B and C in 1 day

$$= \frac{1}{10} + \frac{1}{12} + \frac{1}{15} = \frac{6+5+4}{60} = \frac{15}{60} = \frac{1}{4}$$

$\therefore$ Required time = 4 days

Hence, the correct option is (c).

37. A and B together can complete a work in 8 days and B and C together in 12 days. All of the three together can complete the work in 6 days. In how much time will A and C together complete the work?

[(SSC SO (CA) Exam. 2006) & (SSC CHSL DEO & LDC Exam. 2011)]

(a) 8 days (b) 10 days

(c) 12 days (d) 20 days

Explanation: Let A and C complete the work in x days.

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

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

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

Then $(A + B + B + C + C + A)$'s 1 day work $= \frac{1}{8} + \frac{1}{12} + \frac{1}{x}$

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

$$= \frac{3x + 2x + 24}{24x}$$

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

According to the question,

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

$$\frac{1}{6} = \frac{5x + 24}{48x}$$

$\Rightarrow \quad 30x + 144 = 48x$

$\therefore \quad x = \frac{144}{18} = 8$ days

Hence, the correct option is (a).

38. If A and B together can finish a piece of work in 20 days, B and C in 10 days and C and A in 12 days, then A, B and C jointly can finish the same work in

(SSC CHSL DEO & LDC Exam. 2011)

(a) $4\frac{2}{7}$ days (b) 30 days

(c) $8\frac{4}{7}$ days (d) $\frac{7}{60}$ days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{20}$

$(B + C)$'s 1 day work $= \frac{1}{10}$

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

On adding all three,

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

$$= \frac{1}{20} + \frac{1}{10} + \frac{1}{12}$$

$$= \frac{3+6+5}{60} = \frac{14}{60} = \frac{7}{30}$$

$\therefore (A + B + C)$'s 1 day work $= \frac{7}{60}$

$\therefore$ Hence, the work will be completed in $\frac{60}{7} = 8\frac{4}{7}$ days.

Hence, the correct option is (c).

39. A and B can do a piece of work in 10 days. B and C can do it in 12 days. A and C can do it in 15 days. How long will A take to do it alone?

(SSC CHSL DEO & LDC Exam. 2011)

(a) 24 days (b) 20 days

(c) 40 days (d) 30 days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{10}$

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

$(C + A)$'s 1 day work $= \frac{1}{15}$

On adding all three,

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

$$= \frac{1}{10} + \frac{1}{12} + \frac{1}{15}$$

$$= \frac{6+5+4}{60} = \frac{15}{60} = \frac{1}{4}$$

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

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

$\therefore$ A will complete the work in 24 days.
Hence, the correct option is (a).

40. A and B working together, can do a piece of work in $4\frac{1}{2}$ hours. B and C working together can do it in 3 hours. C and A working 1 together can do it in $2\frac{1}{2}$ hours. All of them begin the work at the same time. Find how much time they will take to finish the piece of work.

[(SSC CPO (SI, ASI & Intelligence Officer) Exam 2011 (Paper-I)]

(a) 3 hours (b) 2 hours
(c) 2.5 hours (d) 3.25 hours

Explanation: $(A + B)$'s 1 hour work

$$= \frac{2}{9} \quad \text{(i)}$$

$(B + C)$'s 1 hour work $= \frac{1}{3}$ (ii)

$(C + A)$'s 1 hour work $= \frac{4}{9}$ (iii)

Adding all three equations,

$$2\,(A + B + C)\text{'s 1 hourwork} = \frac{2}{9} + \frac{1}{3} + \frac{4}{9} = \frac{2+3+4}{9} = 1$$

$\therefore$ A, B and C together will complete the work in 2 hours.
Hence, the correct option is (b).

41. A and B together can do a work in 10 days. B and C together can do the same work in 6 days. A and C together can do the work in 12 days. Then A, B and C together can do the work in **(SSC CGL Tier-I Exam 2011)**

(a) 28 days (b) 14 days
(c) $5\frac{5}{7}$ days (d) $8\frac{2}{7}$ days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{10}$

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

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

Adding all three, $2\,(A + B + C)$'s 1 day work

$$= \frac{1}{10} + \frac{1}{6} + \frac{1}{12} = \frac{6+10+5}{60} = \frac{21}{60} = \frac{7}{20}$$

$\therefore$ $(A + B + C)$'s 1 day work $= \frac{7}{40}$

$\therefore$ All three together will complete the work in $\frac{40}{7} = 5\frac{5}{7}$ days

Hence, the correct option is (c).

42. A and B can complete a piece of work in 8 days, B and C can do it in 12 days, C and A can do it in 8 days. A, B and C together can complete it in **(SSC CGL Tier-I Exam 2011)**

(a) 4 days (b) 5 days
(c) 6 days (d) 7 days

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

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

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

On adding,

$$2\,(A + B + C)\text{'s 1 day work} = \frac{1}{8} + \frac{1}{12} + \frac{1}{8} = \frac{3+2+3}{24} = \frac{8}{24} = \frac{1}{3}$$

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

Hence, the work will be completed in 6 days.

Method 2:
Quicker Approach

$$\text{Time} = \frac{2xyz}{xy + yz + zx}$$

(Here, $x = 8$, $y = 12$; $z = 8$)

$$= \frac{2\times8\times12\times8}{96\times96\times64} = \frac{2\times8\times12\times8}{256} = 6 \text{ days}$$

Hence, the correct option is (c).

43. A and B can do a piece of work in 8 days, B and C can do it in 24 days, while C and A can do it in $8\frac{4}{7}$ days. In how many days can C do it alone?

[SSC Multi-Tasking (Non-technical) Staff Exam. 2011)]

(a) 60 days (b) 40 days
(c) 30 days (d) 10 days

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

$(B + C)$'s 1 day work $= \frac{1}{24}$

$(C + A)$'s 1 day work $= \frac{7}{60}$

On adding all three,

$$2\,(A + B + C)\text{'s 1 day work} = \frac{1}{8} + \frac{1}{24} + \frac{7}{60} = \frac{15+5+14}{120} = \frac{34}{120}$$

$\therefore$ $(A + B + C)$'s 1 day work $= \frac{17}{120}$

$\therefore$ C's 1 day work

$$= \frac{17}{120} - \frac{1}{8} = \frac{17-15}{120} = \frac{1}{60}$$

$\therefore$ C alone will complete the work in 60 days.
Hence, the correct option is (a).

44. A and B can do a piece of work in 72 days. B and C can do it in 120 days, A and C can do it in 90 days. In how many days all the three together can do the work?

[SSC CGL Prelim Exam, 1999 & SSC MTS (Non-Technical) Exam. 2011]

(a) 80 days (b) 100 days
(c) 60 days (d) 150 days

Explanation: $(A + B)$'s 1 day work$= \frac{1}{72}$

$(B + C)$'s 1 day work $= \frac{1}{20}$

$(C + A)$'s 1 day work $= \frac{1}{90}$

On adding all three

$$2\,(A + B + C)\text{'s 1 day work} = \frac{1}{72} + \frac{1}{120} + \frac{1}{90} = \frac{5+3+4}{360} = \frac{1}{30}$$

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

$\therefore$ $(A + B + C)$ will do the work in 60 days.
Hence, the correct option is (c).

45. A, B and C together can complete a piece of work in 30 minutes. A and B together can complete the same work in 50 minutes. C alone can complete the work in **(SSC CHSL DEO & LDC Exam. 2010)**

(a) 60 minutes (b) 75 minutes
(c) 80 minutes (d) 150 minutes

Explanation: Work done by $(A + B + C)$ in 1 minute $= \frac{1}{30}$

Work done by $(A + B)$ in 1 minute $= \frac{1}{50}$

$\therefore$ Work done by C alone in 1 minute

$$= \frac{1}{30} - \frac{1}{50}$$

$$= \frac{5-3}{150} = \frac{2}{150} = \frac{1}{75}$$

$\therefore$ C alone will complete the work in 75 minutes.

Hence, the correct option is (b).

46. If A and B together can complete a work in 12 days, B and C together in 15 days and C and A together in 20 days, then B alone can complete the work in **(SSC Investigator Exam 2010)**

(a) 30 days (b) 25 days

(c) 24 days (d) 20 days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{12}$

$(B + C)$'s 1 day work $= \frac{1}{15}$

$(C + A)$'s 1 day work $= \frac{1}{20}$

On adding

$$2\,(A + B + C)\text{'s 1 day work}$$

$$= \frac{1}{12} + \frac{1}{15} + \frac{1}{20} = \frac{5+4+3}{60} = \frac{1}{5}$$

$\therefore$ $(A + B + C)$'s 1 day work$= \frac{1}{10}$

$\therefore$ B's 1 day work

$$= \frac{1}{10} - \frac{1}{20} = \frac{2-1}{20} = \frac{1}{20}$$

$\therefore$ B alone can do the work in 20 days.

Hence, the correct option is (d).

47. A and B together can complete a piece of work in 18 days, B and C in 24 days and A and C in 36 days. In how many days, will all of them together complete the work? **[SSC CISF ASI Exam 2010 (Paper-I)]**

(a) 16 days (b) 15 days

(c) 12 days (d) 10 days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{18}$

$(B + C)$'s 1 day work $= \frac{1}{24}$

$(A + C)$'s 1 day work $= \frac{1}{36}$

Adding all three,

$$2\,(A + B + C)\text{'s 1 day work}$$

$$= \frac{1}{18} + \frac{1}{24} + \frac{1}{36}$$

$$= \frac{4+3+2}{72} = \frac{1}{8}$$

$\therefore$ $(A + B + C)$' 1 day work $= \frac{1}{6}$

$\therefore$ A, B and C together will complete the work in 16 days.

Hence, the correct option is (a).

48. If A and B together can complete a piece of work in 15 days and B alone in 20 days, in how many days can A alone complete the work? **(SSC CGL Tier-I Exam. 2010)**

(a) 60 days (b) 45 days

(c) 40 days (d) 30 days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{15}$

B's 1 day work $= \frac{1}{20}$

$\therefore$ A's 1 day work

$$= \frac{1}{15} - \frac{1}{20} = \frac{4-3}{60} = \frac{1}{60}$$

$\therefore$ A alone will do the work in 60 days.

Hence, the correct option is (a).

49. A and B can do a piece of work in 10 days. B and C can do it in 12 days. C and A in 15 days. In how many days will C finish it alone? **(SSC CPO S.I, Exam. 2009)**

(a) 24 days (b) 30 days

(c) 40 days (d) 60 days

Explanation: $(A + B)$'s 1 day work

$$= \frac{1}{10} \qquad \text{(i)}$$

$(B + C)$'s 1 day work

$$= \frac{1}{12} \qquad \text{(ii)}$$

$(C + A)$'s 1 day work

$$= \frac{1}{15} \qquad \text{(iii)}$$

On adding all these,

$$2(A + B + C)\text{'s 1 day work}$$

$$= \frac{1}{10} + \frac{1}{12} + \frac{1}{15}$$

$$= \frac{6+5+4}{60} = \frac{1}{4}$$

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

$\therefore$ C's 1 day work

$$= \frac{1}{8} - \frac{1}{10} = \frac{5-4}{40} = \frac{1}{40}$$

$\therefore$ C will finish the work in 40 days.

Hence, the correct option is (c).

50. A and B together can do a piece of work in 5 days and A alone can do it in 8 days. B alone can do the same piece of work in **(SSC DEO Exam. 2008)**

(a) $11\frac{1}{3}$ days (b) $12\frac{3}{5}$ days

(c) $13\frac{1}{3}$ days (d) $16\frac{4}{5}$ days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{5}$

A's 1 day work $= \frac{1}{8}$

$\therefore$ B's 1 day work $= \frac{1}{5} - \frac{1}{8}$

$$= \frac{8-5}{40} = \frac{3}{40}$$

$\therefore$ B alone will complete the work in $\frac{40}{3} = 13\frac{1}{3}$ days

Hence, the correct option is (c).

51. While working 7 hours a day, A alone can complete a piece of work in 6 days and B alone in 8 days. In what time would they complete it together, working 8 hours a day? **(SSC CGL Prelim Exam. 2008)**

(a) 3 days (b) 4 days

(c) 2.5 days (d) 3.6 days

Explanation: A alone can complete the work in 42 days working 1 hour daily. Similarly, B will take 56 days working 1 hour daily.

A's l day work $= \frac{1}{42}$

B's l day work $= \frac{1}{56}$

$(A + B)$'s 1 day work

$$= \frac{1}{42} + \frac{1}{56} = \frac{4+3}{168} = \frac{7}{168}$$

$\therefore$ Time taken by $(A + B)$ working 8 hours daily $= \frac{168}{7 \times 8} = 3$ days

Hence, the correct option is (a).

52. If A and B together can complete a work in 18 days, A and C together in 12 days and B and C together in 9 days, then B alone can do the work in **[SSC SO (CA) Exam. 2007]**

(a) 18 days (b) 24 days

(c) 30 days (d) 40 days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{18}$

$(B + C)$'s 1 day work $= \frac{1}{9}$

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

Adding all the above three,

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

$$= \frac{1}{18} + \frac{1}{9} + \frac{1}{12}$$

$$= \frac{2+4+3}{36} = \frac{9}{36} = \frac{1}{4}$$

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

$\therefore$ B's 1 day work = $(A + B + C)$'s 1 day work $-$ $(A + C)$'s 1 day work

$$= \frac{1}{8} - \frac{1}{12} = \frac{3-2}{24} = \frac{1}{24}$$

Hence, B alone can do the work in 24 days. Hence, the correct option is (b).

53. A alone can complete a work in 12 days. A and B together can complete it in 8 days. How long will B alone take to complete the work?

(SSC CGL Prelim Exam. 2007)

(a) 24 days (b) 18 days

(c) 16 days (d) 20 days

Explanation: A's 1 day work $= \frac{1}{12}$

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

$\therefore$ B's 1 day work

$$= \frac{1}{8} - \frac{1}{12} = \frac{3-2}{24} = \frac{1}{24}$$

$\therefore$ B alone can do the work in 24 days. Hence, the correct option is (a).

54. A and B can complete a piece of work in 30 days, B and C in 20 days, while C and A in 15 days. If all of them work together, the time taken in completing the work will be

(SSC CGL Prelim Exam. 2005)

(a) 10 days (b) 12 days

(c) $12\frac{2}{3}$ days (d) $13\frac{1}{3}$ days

Explanation: Work done by $(A + B)$ in 1 day

$$= \frac{1}{30}$$

Work done by $(B + C)$ in 1 day

$$= \frac{1}{20}$$

Work done by $(C + A)$ in 1 day

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

On adding,

Work done by $2\ (A + B + C)$ in 1 day $= \frac{1}{30} + \frac{1}{20} + \frac{1}{15}$

$$= \frac{2+3+4}{60}$$

$$= \frac{9}{60} = \frac{3}{20}$$

$\therefore$ Work done by $(A + B + C)$ in l day $= \frac{3}{40}$

$\therefore$ $(A + B + C)$ will do the work in $\frac{40}{3} = 13\frac{1}{3}$ days

Hence, the correct option is (d).

55. A and B can do a piece of work in 12 days, B and C in 8 days and C and A in 6 days. How long would B take to do the same work alone?

[SSC CGL Prelim Exam. 2002 & SSC CGL Prelim Exam. 2005]

(a) 24 days (b) 32 days

(c) 40 days (d) 48 days

Explanation: $(A + B)$'s 1 day work

$$= \frac{1}{12} \quad \text{(i)}$$

$(B + C)$'s 1 day work

$$= \frac{1}{8} \quad \text{(ii)}$$

$(C + A)$'s 1 day work

$$= \frac{1}{6} \quad \text{(iii)}$$

On adding,

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

$$= \frac{1}{12} + \frac{1}{8} + \frac{1}{6}$$

$$= \frac{2+3+4}{24} = \frac{9}{24}$$

$\therefore\ (A + B + C)$'s 1 day work

$$= \frac{9}{24 \times 2} = \frac{9}{48} \quad \text{(iv)}$$

On, subtracting (iii) from (iv),

B's 1 day work $= \frac{9}{48} - \frac{1}{6}$

$$= \frac{9-8}{48} = \frac{1}{48}$$

$\therefore$ B can complete the work in 48 days. Hence, the correct option is (d).

56. A can do a piece of work in 4 hours; B and C can do it in 3 hours. A and C can do it in 2 hours. How long will B alone take to do it?

(SSC CGL Prelim Exam. 2002 & 2005)

(a) 10 hours

(b) 12 hours

(c) 8 hours

(d) 24 hours

Explanation: A's 1 hour work $= \frac{1}{4}$

$(B + C)$'s 1 hour work $= \frac{1}{3}$

$(A + C)$'s 1 hour work $= \frac{1}{2}$

$\therefore$ C's 1 hour work

$$= \frac{1}{2} - \frac{1}{4} = \frac{2-1}{4} = \frac{1}{4}$$

and B's 1 hour work

$$= \frac{1}{3} - \frac{1}{4} = \frac{4-3}{12} = \frac{1}{12}$$

Hence, B alone can do the work in 12 hours. Hence, the correct option is (b).

57. A and B together can do a work in 8 days, B and C together in 6 days while C and A together in 10 days, if they all work together, the work will be completed in

(SSC CGL Prelim Exam. 2005)

(a) $3\frac{3}{4}$ days (b) $3\frac{3}{7}$ days

(c) $5\frac{5}{47}$ days (d) $4\frac{4}{9}$ days

Explanation: $(A + B)$'s 1 day work

$$= \frac{1}{8}$$

$(B + C)$'s 1 day work

$$= \frac{1}{6}$$

$(C + A)$'s 1 day work

$$\frac{1}{10}$$

On adding,

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

$$= \frac{1}{8} + \frac{1}{6} + \frac{1}{10}$$

$$= \frac{15+20+12}{120} = \frac{47}{120}$$

$\Rightarrow$ $(A + B + C)$'s 1 day work

$$= \frac{47}{240}$$

$\therefore$ $(A + B + C)$ together will complete the work in $\frac{240}{47} = 5\frac{5}{47}$ days

Hence, the correct option is (c).

58. A and B together can complete a piece of work in 72 days, B and C together can complete it in 120 days, and A and C together in 90 days. In what time can A alone complete the work?

(SSC CPO S.I, Exam. 2005)

(a) 80 days (b) 100 days
(c) 120 days (d) 150 days

Explanation: $(A + B)$'s 1 day work

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

$(B + C)$'s 1 day work $= \frac{1}{120}$

$(C + A)$'s 1 day work $= \frac{1}{90}$

Adding all three,

$$2(A + B + C)\text{'s 1 day work} = \frac{1}{72} + \frac{1}{120} + \frac{1}{90}$$

$$= \frac{5+3+4}{360} = \frac{12}{360} = \frac{1}{30}$$

$\therefore$ $(A + B + C)$'s 1 day work

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

Now, A's l day work = $(A + B + C)$'s 1 day work $-$ $(B + C)$'s 1 day work

$$= \frac{1}{60} - \frac{1}{120} = \frac{2-1}{120} = \frac{1}{120}$$

$\therefore$ A alone can complete the work in 120 days.

Hence, the correct option is (c).

59. A and B together can do a piece of work in 10 days. A alone can do it in 30 days. The time in which B alone can do it is **(SSC CPO S.I, Exam. 2004)**

(a) 10 days (b) 12 days
(c) 15 days (d) 20 days

Explanation: $(A + B)$'s 1 day work $= \frac{1}{10}$

A's 1 day work $= \frac{1}{30}$

$\therefore$ B's 1 day work $= \frac{1}{10} - \frac{1}{30}$

$$= \frac{3-1}{30} = \frac{2}{30} = \frac{1}{15}$$

Hence, B, alone can complete the work in 15 days.

Hence, the correct option is (c).

60. A, B and C can complete a piece of work in 24, 6 and 12 days respectively. Working together, they will complete the same work in **(SSC CPO S.I, Exam. 2003)**

(a) $\frac{1}{4}$ days (b) $\frac{7}{24}$ days
(c) $3\frac{3}{7}$ days (d) 4 days

Explanation: A's 1 day work $= \frac{1}{24}$

B's 1 day work $= \frac{1}{6}$

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

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

$$= \frac{1}{24} + \frac{1}{6} + \frac{1}{12} = \frac{1+4+2}{24} = \frac{7}{24}$$

$\therefore$ The work will be completed by them in $\frac{24}{7}$, i.e., $3\frac{3}{7}$ days

Hence, the correct option is (c).

61. A and B can do a piece of work in 10 days, B and C in 15 days and C and A in 20 days. C alone can do the work in **(SSC CGL, Prelim Exam. 2002)**

(a) 60 days (b) 120 days
(c) 80 days (d) 30 days

Explanation: According to the question,

Work done by A and B together in one day $= \frac{1}{10}$ part

Work done by B and C together in one day $= \frac{1}{15}$ part

Work done by C and A together in one day $= \frac{1}{20}$ part

So,

$$A + B = \frac{1}{10} \quad \text{(i)}$$

$$B + C = \frac{1}{15} \quad \text{(ii)}$$

$$C + A = \frac{1}{20} \quad \text{(iii)}$$

Adding (i), (ii) and (iii), we get

$$2(A + B + C) = \frac{1}{10} + \frac{1}{15} + \frac{1}{20}$$

$$2(A + B + C) = \frac{6+4+3}{60} = \frac{13}{60}$$

$$A + B + C = \frac{13}{120} \quad \text{(iv)}$$

Substituiting the value of equation (i) in (iv)

$$\frac{1}{10} + C = \frac{13}{120}$$

$$C = \frac{13}{120} - \frac{1}{10} = \frac{13-12}{120} = \frac{1}{120}$$

$\therefore$ Work done in 1 day by C is $\frac{1}{120}$ part.

Hence, C will finish the whole work in 120 days.

Hence, the correct option is (b).

62. A can do a work in 6 days and B in 9 days. How many days will both take together to complete the work?

(SSC CGL Prelim Exam. 2000)

(a) 7.5 days (b) 5.4 days
(c) 3.6 days (d) 3 days

Explanation: According to the question, A can finish the whole work in 6 days.

$\therefore$ A's one day work $= \frac{1}{6}$

Similarly,

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

$(A + B)$'s one day work

$$= \left(\frac{1}{6} + \frac{1}{9}\right) = \left(\frac{3+2}{18}\right) = \frac{5}{18}$$

Therefore, A and B can finish the whole work in $\frac{18}{5}$ days, i.e., 3.6 days.

Hence, the correct option is (c).

63. A particular job can be completed by a team of 10 men in 12 days. The same job can be completed by a team of 10 women in 6 days. How many days are needed to complete the job if the two teams work together?

(SSC CGL Prelim Exam. 2000)

(a) 4 days (b) 6 days
(c) 9 days (d) 18 days

Explanation: According to the question,

10 men's one day work $= \frac{1}{12}$

$\therefore$ 1 man's one day work

$$= \frac{1}{12 \times 10} = \frac{1}{120}$$

Similarly,

1 woman's one day work

$$= \frac{1}{6\times 10} = \frac{1}{60}$$

$\therefore$ (1 man + 1 woman)'s one day work = $\frac{1}{120}+\frac{1}{60}$

$$= \frac{1+2}{120} = \frac{3}{120} = \frac{1}{40}$$

$\therefore$ (10 men + 10 women)'s one day work = $\frac{10}{40} = \frac{1}{4}$

Therefore, both the teams can finish the whole work in 4 days.

Hence, the correct option is (c).

Section II — Question Based on Where Worker Leaves or Joins

1. A group of workers can complete a piece of work in 50 days, when they are working individually. On the first day one person works, on the second day another person joins him, on the third day one more person joins them and this process continues till the work is completed. How many approximate days are needed to complete the work?

[SSC SI & Assistant SI (CISF) Prelim Exam. 2016]

(a) 9 days (b) 10 days

(c) 13 days (d) 19 days

Explanation: Work done by worker in 1 day = $\frac{1}{50}$

$$\frac{1}{50}+\frac{2}{50}+\frac{3}{50}+\ldots+\frac{x}{50}=1$$

$\Rightarrow$ It is an AP $d=\frac{1}{50}, a=\frac{1}{50}$,

Sum = 1, $n = x$

$$\Rightarrow \frac{x}{2}\left[2\times\frac{1}{50}+(x-1)\times\frac{1}{50}\right]=1$$

$$\Rightarrow x\left[2+(x-1)\right]=100$$

$$\Rightarrow x[1+x]=100$$

$$\Rightarrow x^2+x-100=0$$

$$\Rightarrow x=\frac{-1\pm\sqrt{1+400}}{2}=\frac{-1\pm\sqrt{401}}{2}$$

$\therefore$ $x = 10$ days (approx)

Hence, the correct option is (b).

2. X can do a piece of work in 24 days. When he had worked for 4 days, Y joined him. If the complete work was finished in 16 days, then Y can alone finish that work in

[SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015]

(a) 18 days (b) 27 days

(c) 36 days (d) 42 days

Explanation: Let Y alone complete the work in x days.

According to the question,

X's 16 days' work + Y's 12 days' work = 1

$$\Rightarrow \frac{16}{24}+\frac{12}{x}=1$$

$$\Rightarrow \frac{2}{3}+\frac{12}{x}=1$$

$$\Rightarrow \frac{12}{x}=1-\frac{2}{3}=\frac{1}{3}$$

$$\Rightarrow x = 12\times 3 = 36 \text{ days}$$

Hence, the correct option is (c).

3. A certain number of men can do a work in 40 days. If there were 8 men more, it could be finished in 10 days less. How many men were there initially?

[SSC Constable (GD) Exam. 2015]

(a) 20 (b) 24

(c) 30 (d) 16

Explanation: Number of men initially = x (Assume)

$$\therefore M_1D_1 = M_2D_2$$

$$\Rightarrow x\times 40 = (x+8)\times 30$$

$$4x = 3x + 24$$

$$4x - 3x = 24$$

$$x = 24 \text{ men}$$

Hence, the correct option is (b).

4. Raja can do a piece of work in 20 days while Ramesh can finish it in 25 days. Ramesh started working and Raja joined him after 10 days. The whole work is completed in

[SSC Constable (GD) Exam, 2015]

(a) 18 days (b) $16\frac{2}{3}$ days

(c) 20 days (d) 15 days

Explanation: Work done by Raja and Ramesh in 1 day

$$= \frac{1}{20}+\frac{1}{25}=\frac{5+4}{100}=\frac{9}{100}$$

Work done by Ramesh in 10 days $= \frac{10}{25}=\frac{2}{5}$

Remaining work $= 1-\frac{2}{5}=\frac{3}{5}$

$\therefore$ This part is done by Raja and Ramesh.

$\therefore$ Time taken

$$= \frac{3}{5}\times\frac{100}{9}=\frac{20}{3}=6\frac{2}{3}\text{ days}$$

$\therefore$ Required time $= 10+6\frac{2}{3}=16\frac{2}{3}$ days

Hence, the correct option is (b).

5. A, B and C can do a piece of work in 24, 30 and 40 days respectively. They began the work together but C left 4 days before completion of the work. In how many days was the work done?

(SSC CGL Tier-I Exam, 2015)

(a) 13 (b) 12

(c) 14 (d) 11

Explanation: Let the work be completed in x days.

According to the question, C worked for $(x-4)$ days.

$$\therefore \frac{x}{24}+\frac{x}{30}+\frac{x-4}{40}=1$$

$$\Rightarrow \frac{5x+4x+3(x-4)}{120}=1$$

$$\Rightarrow \frac{12x-12}{120}=1$$

$$\Rightarrow \frac{12(x-1)}{120}=1$$

$$\Rightarrow \frac{x-1}{10}=1\Rightarrow x-1=10$$

$$\Rightarrow x = 10 + 1 = 11 \text{ days}$$

Hence, the correct option is (d).

6. 20 men can do a piece of work in 18 days. They worked together for 3 days, then 5 men joined them. In how many more days is the work completed?

(SSC CAPFs SI, CISF ASI & DP SI Exam, 2015)

(a) 15 (b) 12
(c) 14 (d) 13

Explanation: Work done by 20 men in 3 days

$$= \frac{3}{18} = \frac{1}{16}\text{part}$$

$$\text{Remaining work} = 1 - \frac{1}{6} = \frac{5}{6}\text{part}$$

$$\therefore \quad \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\Rightarrow \quad \frac{20 \times 18}{1} = \frac{25 \times D_2}{\frac{5}{6}}$$

$$\Rightarrow \quad 6 \times 25 \times D_2 = 5 \times 20 \times 18$$

$$\Rightarrow \quad D_2 = \frac{5 \times 20 \times 18}{6 \times 25} = 12 \text{ days}$$

Hence, the correct option is (b).

7. A and B can do a piece of work in 45 and 40 days respectively. They began the work together but A left after some days and B finished the remaining work in 23 days. A left after

(SSC CGL Tier-II Exam, 2014 & 2015)

(a) 6 days (b) 9 days
(c) 12 days (d) 5 days

Explanation: Let A left the work after x days.

According to the question, work done by A in x days + work done by B in $(23 + x)$ days = 1

$$\Rightarrow \quad \frac{x}{45} + \frac{23+x}{40} = 1$$

$$\Rightarrow \quad \frac{8x + 207 + 9x}{360} = 1$$

$$\Rightarrow \quad 17x + 207 = 360$$

$$\Rightarrow \quad 17x = 360 - 207 = 153$$

$$\Rightarrow \quad x = \frac{153}{17} = 9 \text{days}$$

Hence, the correct option is (b).

8. A certain number of men can do a piece of work in 40 days. If there were 45 men more the work could have been finished in 25 days. Find the original number of men employed in the work.

(SSC CHSL (10+2) DEO & LDC Exam. 2014)

(a) 70 (b) 85
(c) 65 (d) 75

Explanation: Original number of men $= x$ (Assume)

$$\therefore \quad M_1D_1 = M_2D_2$$

$$\Rightarrow \quad x \times 40 = (x + 45) \times 25$$

$$\Rightarrow \quad 8x = (x + 45) \times 5$$

$$\Rightarrow \quad 8x = 5x + 225$$

$$\Rightarrow \quad 8x - 5x = 225$$

$$\Rightarrow \quad 3x = 225$$

$$\Rightarrow \quad x = \frac{225}{3} = 75 \text{ men}$$

Hence, the correct option is (d).

9. Some staff promised to do a job in 18 days, but 6 of them went on leave. So the remaining men took 20 days to complete the job. How many men were there originally?

[SSC CHSL (10+2) DEO & LDC Exam. 2014]

(a) 55 (b) 62
(c) 56 (d) 60

Explanation: Number of men originally $= x$ (Assume)

$$\therefore \quad M_1 D_1 = M_2 D_2$$

$$\Rightarrow \quad x \times 18 = (x - 6) \times 20$$

$$\Rightarrow \quad x \times 9 = (x - 6) \times 10$$

$$= 10x - 60$$

$$\Rightarrow \quad 10x - 9x = 60$$

$$\Rightarrow \quad x = 60 \text{ men}$$

Hence, the correct option is (d).

10. A certain number of men complete a piece of work in 60 days. If there were 8 men more, the work could be finished in 10 days less. The number of men originally was

[SSC CHSL (10+2) DEO & LDC Exam. 2014]

(a) 30 (b) 40
(c) 32 (d) 36

Explanation: Number of men originally $= x$ (Assume)

$$\therefore \quad M_1 D_1 = M_2 D_2$$

$$\Rightarrow \quad x \times 60 = (x + 8) \times 50$$

$$\Rightarrow \quad 6x = 5x + 40$$

$$\Rightarrow \quad 6x - 5x = 40$$

$$\Rightarrow \quad x = 40 \text{ men}$$

Hence, the correct option is (b).

11. If 12 men or 24 boys can do a work in 66 days, then the number of days in which 15 men and 6 boys can do it is

(SSC CHSL DEO & LDC Exam. 2014)

(a) 44 (b) 33
(c) 55 (d) 66

Explanation: 12 men = 24 boys

$\therefore$ 1 man = 2 boys

$\therefore$ 15 men + 6 boys

= 30 boys + 6 boys = 36 boys

$$\therefore \quad M_1D_1 = M_2D_2$$

$$\Rightarrow \quad 24 \times 66 = 36 \times D_2$$

$$\Rightarrow \quad D_2 = \frac{24 \times 66}{36} = 44 \text{ days}$$

Hence, the correct option is (a).

12. 16 women take 12 days to complete a work which can be completed by 12 men in 8 days. 16 men started working and after 3 days 10 men left and 4 women joined them. How many days will it take them to complete the remaining work?

(SSC CHSL GL DEO & LDC Exam. 2014)

(a) 4 (b) 6
(c) 8 (d) 10

Explanation: Work done by 12 men in 8 days = Work done by 16 women in 12 days

$\Rightarrow 12 \times 8$ men $\equiv 16 \times 12$ women

$\Rightarrow$ 1 man $\equiv$ 2 women

Now, work done by 12 men in 1 day $= \frac{1}{8}$

$$\text{1 man's 1 day work} = \frac{1}{12 \times 8} = \frac{1}{96}$$

$$\therefore \text{ 16 men's 3 day work} = \frac{16 \times 3}{96} = \frac{1}{2}$$

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

Now, $\frac{1}{2}$ work is done by 6 men and 4 women.

$\therefore$ 6 men + 4 women

= (6 + 2) men = 8 men

$$\therefore \quad \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\frac{12 \times 8}{1} = \frac{8 \times D_2}{\frac{1}{2}}$$

$$D_2 = \frac{12 \times 8}{2 \times 8} = 6 \text{ days}$$

Hence, the correct option is (b).

13. 40 men can complete a work in 18 days. Eight days after they started working together, 10 more men joined them. How many days will they now take to complete the remaining work?

(SSC CHSL DEO & LDC Exam. 2014)

(a) 6 (b) 8

(c) 10 (d) 12

Explanation: 40 men complete the work in 18 days.

$\therefore$ Their 1 day work $= \frac{1}{18}$

$\therefore$ Their 8 days' work $= \frac{8}{18} = \frac{4}{9}$

Remaining work $= 1 - \frac{4}{9} = \frac{5}{9}$

New number of men $= 40 + 10 = 50$

$$\therefore \quad \frac{M_1 D_1}{W_1} = \frac{M_2 D_2}{W_2}$$

$$\frac{40 \times 18}{1} = \frac{50 \times D_2}{\frac{5}{9}}$$

$$40 \times 18 = 90 \times D_2$$

$$D_2 = \frac{40 \times 18}{90} = 8 \text{ days}$$

Hence, the correct option is (b).

14. A and B can together finish a work in 30 days. They worked at it for 20 days and then B left. The remaining work was done by A alone in 20 more days A alone can finish the work in **(SSC CGL Tier-I Exam. 2014)**

(a) 60 days (b) 54 days

(c) 48 days (d) 50 days

Explanation: $(A + B)$ together do the work in 30 days.

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

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

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

$\because$ Time taken by A in doing $\frac{1}{3}$ work = 20 days

$\therefore$ Time taken in doing 1 work $= 20 \times 3 =$ 60 days

Hence, the correct option is (a).

15. A, B and C together can do a piece of work in 40 days. After working with B and C for 16 days, A leaves and then B and C completes the remaining work in 40 days more. A alone could do the work in

(SSC CGL Tier-I Exam. 2014)

(a) 80 days (b) 90 days

(c) 100 days (d) 120 days

Explanation: A, B and C together complete the work in 40 days.

$\therefore$ $(A + B + C)$'s 1 day work $= \frac{1}{40}$

$\therefore$ $(A + B + C)$'s 16 day's work $= \frac{16}{40} = \frac{2}{5}$

Remaining work $= 1 - \frac{2}{5} = \frac{3}{5}$

This part of work is done by B and C in 40 days.

$\therefore$ Time taken in doing $\frac{3}{5}$ work $= 40$ days

$\therefore$ Time taken in doing in 1 work

$$= \frac{40 \times 5}{3} = \frac{200}{3} \text{days}$$

$\therefore$ A's 1 day work = $(A + B + C)$'s 1 day work $-$ $(B + C)$'s 1 day work

$$= \frac{1}{40} - \frac{3}{200} = \frac{5-3}{200} = \frac{2}{200}$$

$$= \frac{1}{100}$$

$\therefore$ Required time = 100 days

Hence, the correct option is (c).

16. A, B and C can do a job in 6 days, 12 days and 15 days respectively. After $\frac{1}{8}$ of the work is completed, C leaves the job. Rest of the work is done by A and B together. The time taken to finish the work is **(SSC CGL Tier-II Exam. 2014)**

(a) $5\frac{5}{6}$ days (b) $5\frac{1}{4}$ days

(c) $3\frac{1}{2}$ days (d) $3\frac{3}{4}$ days

Explanation: Remaining work

$$= 1 - \frac{1}{8} = \frac{7}{8}$$

$(A + B)$'s 1 day's work

$$= \frac{1}{6} + \frac{1}{12} = \frac{2+1}{12} = \frac{3}{12} = \frac{1}{4}$$

$\therefore$ Time taken in doing $\frac{7}{8}$ part of work

$$= \frac{7}{8} \times 4 = \frac{7}{8} = 3\frac{1}{2} \text{days}$$

Hence, the correct option is (c).

17. A and B together can complete a job in 8 days. Both B and C working alone can finish the same job in 12 days. A and B commence work on the job and work for 4 days, where upon A leaves. B continues for 2 more days, and then he leaves too. C now starts working, and finishes the job. How many days did C require?

(SSC CGL Tier-I Re-Exam. 2013 & 2014)

(a) 5 (b) 8

(c) 3 (d) 4

Explanation: Work done by A and B in first 6 days = $(A + B)$'s work + B's 2 day's work

$$= 4 \times \frac{1}{8} + \frac{2}{12} = \frac{1}{2} + \frac{1}{6} = \frac{3+1}{6} = \frac{4}{6} = \frac{2}{3}$$

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

$\therefore$ Time taken by $C = \frac{1}{3} \times 12 = 4$ days

Hence, the correct option is (d).

18. A and B can together finish a work in 30 days. They worked together for 20 days and then B left. After another 20 days, A finished the remaining work. In how many days A alone can finish the job?

[(SSC CGL Prelim Exam. 2003) & (SSC DEO & LDC Exam. 2013)]

(a) 50 days (b) 60 days

(c) 48 days (d) 54 days

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

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

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

Now, $\frac{1}{3}$ part of work is done by A in 20 days.

$\therefore$ Whole work will be done by A alone in $20 \times 3 = 60$ days.

Hence, the correct option is (b).

19. A can do a piece of work in 20 days and B in 30 days. They work together for 7 days and then both leave the work, then C alone finishes the remaining work in 10 days. In how many days will C finish the full work? **(SSC GL Tier-II Exam. 2013)**

(a) 25 days

(b) 30 days

(c) 24 days

(d) 20 days

Explanation: Work done by A and B in 7 days

$$=\frac{7}{20}+\frac{7}{30}=\frac{21+14}{60}=\frac{35}{60}=\frac{7}{12}$$

So, remaining work $=1-\frac{7}{12}=\frac{5}{12}$

$\therefore$ Time taken by $C=\frac{12}{5}\times 10=24$ days

Hence, the correct option is (c).

20. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

[(**SSC CPO S.I, Exam. 2008**) & (**SSC GL Tier-I Exam. 2013**)]

(a) 10 days (b) 12 days
(c) 15 days (d) 20 days

Explanation: ($A+B+C$)'s 1 day work

$$=\frac{1}{20}+\frac{1}{30}+\frac{1}{60}=\frac{3+2+1}{60}=\frac{1}{10}$$

A's 2 day's work $=\frac{2}{20}=\frac{1}{10}$

$\therefore$ Work done in first three days

$$=\frac{1}{10}+\frac{1}{10}=\frac{2}{10}=\frac{1}{5}$$

[As work for 2 days + ($A+B+C$) work on 3rd day]

Hence, the work will be finished in 15 days.

Hence, the correct option is (c).

21. A and B together can complete a work in 3 days. They start together. But, after 2 days, B left the work. If the work is completed after 2 more days, B alone could do the work in

[(**SSC CGL Prelim Exam. 2007**) & (**SSC GL Tier-I Exam. 2013**)]

(a) 10 days (b) 4 days
(c) 6 days (d) 8 days

Explanation: ($A+B$)'s 2 days' work $=\frac{2}{3}$

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

Time taken by A in doing $\frac{1}{3}$ work = 2 days

$\therefore$ Time taken by A in completing the work = 6 days

$\therefore$ B's 1 day work $=\frac{1}{3}-\frac{1}{6}=\frac{2-1}{6}=\frac{1}{6}$

$\therefore$ B alone will complete the work in 6 days.
Hence, the correct option is (c).

22. A can finish a work in 18 days and B can do the same work in 5 days. B worked for 10 days and left the job. In how many days, A alone can finish the remaining work? (**SSC GL Tier-I Exam. 2013**)

(a) 6 days (b) $5\frac{1}{2}$ days
(c) 5 days (d) 8 days

Explanation: Work done by B in 10 days

$$=\frac{10}{15}=\frac{2}{3}$$

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

$\therefore$ Time taken by A to complete the work $=\frac{1}{3}\times 18=6$ days

Hence, the correct option is (a).

23. A and B together can do a piece of work in 12 days which B and C together can do in 16 days. After A has been working at it for 5 days and B for 7 days, C finishes it in 13 days. In how many days B could finish the work? (**SSC GL Tier-I Exam. 2013**)

(a) 48 days (b) 24 days
(c) 16 days (d) 12 days

Explanation: Let the work done by each one of A, B and C per day be x, y, and z respectively.

$\therefore$ $x+y=\frac{1}{12}$

$$x=\frac{1}{12}-y \qquad \text{(i)}$$

$$y+z=\frac{1}{16}\Rightarrow z=\frac{1}{16}-y \qquad \text{(ii)}$$

Again, $5x+7y+13z=1$

$$5\left(\frac{1}{12}-y\right)+7y+13\left(\frac{1}{16}-y\right)=1$$

$$\Rightarrow \quad \frac{5}{12}-5y+7y+\frac{13}{16}-13y=1$$

$$\Rightarrow \quad 11y=\frac{5}{12}+\frac{13}{16}-1$$

$$=\frac{20+39-48}{48}=\frac{11}{48}$$

$$\Rightarrow \quad y=\frac{1}{48}$$

$\therefore$ B alone will complete the work in 48 days.
Hence, the correct option is (a).

24. A, B and C can complete a work in 10, 12 and 15 days respectively. They started the work together. But A left the work before 5 days of its completion. B also left the work 2 days after A left. In how many days was the work completed?

[(**SSC CGL Prelim Exam. 1999**) & (**SSC MTS Exam. 2013**)]

(a) 4 days (b) 5 days
(c) 7 days (d) 8 days

Explanation: Let the work be completed in x days.

According to the question,

$$\frac{x-5}{10}+\frac{x-3}{12}+\frac{x}{15}=1$$

$$\Rightarrow \quad \frac{6x-30+5x-15+4x}{60}=1$$

$$\Rightarrow \quad 15x-45=60$$

$$\Rightarrow \quad 15x=105\Rightarrow x=\frac{105}{15}=7$$

Hence, the work will be completed in 7 days.

Hence, the correct option is (c).

25. A can do a piece of work in 8 days which B can destroy in 3 days. A has worked for 6 days, during the last 2 of which B has been destroying; how many days must A now work alone to complete the work? (**SSC Multi-Tasking Staff Exam. 2013**)

(a) 7 days (b) $7\frac{1}{3}$ days
(c) $7\frac{2}{3}$ days (d) 8 days

Explanation: Work done by A in 6 days

$$=\frac{6}{8}=\frac{3}{4}\text{ part}=\frac{2}{3}\text{ part}$$

Remaining work after destruction

$$=\frac{3}{4}-\frac{2}{3}=\frac{9-8}{12}=\frac{1}{12}$$

Now, time taken by A in doing $\frac{11}{12}$ parts

$$=\frac{11}{12}\times 8=\frac{22}{3}=7\frac{1}{3}\text{days}$$

Hence, the correct option is (b).

26. A can do a piece of work in 20 days which B can do in 12 days. B worked at it for 9 days. A can finish the remaining work in (**SSC CHSL DEO & LDC Exam. 2012**)

(a) 5 days (b) 7 days
(c) 11 days (d) 3 days

Explanation: Work done by B in 9 days

$$= \frac{9}{12} = \frac{3}{4} \text{ part}$$

Remaining work $= 1 - \frac{3}{4} = \frac{1}{4}$ which is done by A

$\therefore$ Time taken by $A = \frac{1}{4} \times 20 = 5$ days

Hence, the correct option is (a).

27. A, B and C can do a piece of work in 30, 20 and 10 days respectively. A is assisted by B on one day and by C on the next day, alternately. How long would the work take to finish? **(SSC GL Tier-II Exam. 2012)**

(a) $9\frac{3}{8}$ days (b) $4\frac{8}{8}$ days

(c) $8\frac{4}{13}$ days (d) $3\frac{9}{13}$ days

Explanation: Work done in first two days

$$= \frac{2}{30} + \frac{1}{20} + \frac{1}{10} = \frac{1}{15} + \frac{1}{20} + \frac{1}{10}$$

$$= \frac{4+3+6}{60} = \frac{13}{60}$$

Work done in first 8 days $= \frac{52}{60}$

Remaining work $= 1 - \frac{52}{60} = \frac{8}{60} = \frac{2}{15}$

$(A+B)$'s 1 day work $= \frac{1}{30} + \frac{1}{20} = \frac{2+3}{60} = \frac{1}{12}$

$\therefore$ Remaining work $= \frac{2}{15} - \frac{1}{12}$

$$= \frac{8-5}{60} = \frac{3}{60} = \frac{1}{20}$$

$(A+C)$'s 1 day work $= \frac{1}{30} + \frac{1}{10} = \frac{1+3}{30} = \frac{2}{15}$

$\therefore$ Time taken $= \frac{1}{20} \times \frac{15}{2} = \frac{3}{8}$ days

Total time $= 9 + \frac{3}{8} = 9\frac{3}{8}$ days

Hence, the correct option is (a).

28. 45 men can complete a work in 16 days. Four days after they started working, 36 more men joined them. How many days will they now take to complete the remaining work?

[SSC Constable (GD) & Rifleman (GD) Exam. 2012]

(a) 6 days (b) 8 days

(c) $6\frac{2}{3}$ days (d) $7\frac{3}{4}$ days

Explanation: 45 men's 4 days' work $= \frac{1}{4}$

Remaining work $= 1 - \frac{1}{4} = \frac{3}{4}$

$$\frac{M_1 D_1}{W_1} = \frac{M_2 D_2}{W_2}$$

$$\frac{45 \times 16}{1} = \frac{81 \times D_2}{\frac{3}{4}}$$

$$D_2 = \frac{45 \times 16}{27 \times 4} = 6\frac{2}{3} \text{ days}$$

Hence, the correct option is (c).

29. A and B together can complete a work in 12 days. A alone can complete in 20 days. If B does the work only half a day daily, then in how many days A and B together will complete the work?

[FCI Assistant Grade-III Exam. 2012 (Paper-I)]

(a) 10 days (b) 20 days

(c) 11 days (d) 15 days

Explanation: B's 1 day work

$$= \frac{1}{12} - \frac{1}{20} = \frac{5-3}{60} = \frac{1}{30}$$

$\therefore$ B's $\frac{1}{2}$ day's work $= \frac{1}{60}$

$\therefore$ $(A+B)$'s 1 day work

$$= \frac{1}{20} + \frac{1}{60} = \frac{3+1}{60} = \frac{1}{15}$$

[$\because$ B works for half day daily]

Hence, the work will be completed in 15 days.

Hence, the correct option is (d).

30. A and B working separately can do a piece of work in 9 and 12 days respectively. If they work for a day alternately with A beginning, the work would be completed in

[(SSC SAS Exam. 2010) & SSC CGL Tier-I Exam. 2011)]

(a) $10\frac{2}{3}$ days (b) $10\frac{1}{2}$ days

(c) $10\frac{1}{4}$ days (d) $10\frac{1}{3}$ days

Explanation: Part of work done by A and B in first two days

$$= \frac{1}{9} + \frac{1}{12} = \frac{4+3}{36} = \frac{7}{36}$$

Part of work done in first 10 days $= \frac{35}{36}$

Remaining work $= 1 - \frac{35}{36} = \frac{1}{36}$

Now it is the turn of A.

$\therefore$ Time taken by $A = \frac{1}{36} \times 9 = \frac{1}{4}$ day

$\therefore$ Total time $= 10 + \frac{1}{4} = 10\frac{1}{4}$ days

Hence, the correct option is (c).

31. A alone can complete a work in 18 days and B alone in 15 days. B alone worked at it for 10 days and then left the work. In how many more days, will A alone complete the remaining work?

[(SSC CPO S.I. Exam. 2010 (Paper-I)]

(a) 5 days (b) $5\frac{1}{2}$ days

(c) 6 days (d) 8 days

Explanation: Part of work done by B in 10 days $= 10 \times \frac{1}{15} = \frac{2}{3}$

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

$\therefore$ Time taken by $A = \frac{1}{3} \times 18 = 6$ days

Hence, the correct option is (c).

32. X alone can complete a piece of work in 40 days. He worked for 8 days and left. Y alone completed the remaining work in 16 days. How long would X and Y together take to complete the work?

(SSC CHSL DEO & LDC Exam. 2010)

(a) $13\frac{1}{3}$ days (b) 14 days

(c) 15 days (d) $16\frac{2}{3}$ days

Explanation: Part of the work done by X in 8 days.

$$= \frac{8}{40} = \frac{1}{5}$$

[$\therefore$ Work done in 1 day $= \frac{1}{40}$]

$\therefore$ Remaining work $= 1 - \frac{1}{5} = \frac{4}{5}$

This part of work is done by Y in 16 days.

$\therefore$ Time taken by Y in doing 1 work

$$= \frac{16 \times 5}{4} = 20 \text{ days}$$

$\therefore$ Work done by X and Y in 1 day

$$= \frac{1}{40} + \frac{1}{20} = \frac{1+2}{40} = \frac{3}{40}$$

$\therefore$ Hence, both together will complete the work in $\frac{40}{3}$, i.e., $13\frac{1}{3}$ days.

Hence, the correct option is (a).

33. A can complete a piece of work in 18 days, B in 20 days and C in 30 days. B and C together start the work and are forced to leave after 2 days. The time taken by A alone to complete the remaining work is **(SSC CGL Tier-I Exam. 2010)**

(a) 10 days (b) 12 days

(c) 15 days (d) 16 days

Explanation: $(B + C)$'s 2 days' work

$$= 2\left(\frac{1}{20}+\frac{1}{30}\right) = 2\left(\frac{3+2}{60}\right)$$

$$= \frac{1}{6}\text{ part}$$

Remaining work

$$= 1-\frac{1}{6} = \frac{5}{6}\text{ part}$$

$\therefore$ Time taken by A to complete this part of work

$$= \frac{5}{8}\times 18 = 15\text{ days}$$

Hence, the correct option is (c).

34. A and B alone can complete a work in 9 days and 18 days respectively. They worked together; however 3 days before the completion of the work A left. In how many days was the work completed?

(SSC CPO S.I, Exam. 2008)

(a) 13 days (b) 8 days

(c) 6 days (d) 5 days

Explanation: Let the work be completed in x days.

According to the question, A worked for $(x-3)$ days, while B worked for x days.

$$\therefore \quad \frac{x-3}{9}+\frac{x}{18}=1$$

$$\Rightarrow \quad \frac{2x-6+x}{18}=1 \Rightarrow 3x-6=18$$

$$\Rightarrow \quad 3x = 18+6 = 24$$

$$\because \quad x = \frac{24}{3} = 8\text{ days}$$

Hence, the correct option is (b).

35. A and B can separately complete a piece of work in 20 days and 30 days respectively. They worked together for some time, then B left the work. If A completed the rest of the work in 10 days, then B worked for **(SSC CGL Prelim Exam. 2008)**

(a) 6 days (b) 8 days

(c) 12 days (d) 16 days

Explanation: Let A and B worked together for x days.

According to the question, part of work done by A for $(x + 10)$ days + part of work done by B for x days = 1

$$\Rightarrow \quad \frac{x+10}{20}+\frac{x}{30}=1$$

$$\Rightarrow \quad \frac{3x+30+2x}{60}=1$$

$$\Rightarrow \quad 5x+30=60$$

$$\Rightarrow \quad 5x=30$$

$$\Rightarrow \quad x=\frac{30}{5}=6\text{ days}$$

Hence, the correct option is (a).

36. A can do a piece of work in 18 days and B in 12 days. They began the work together, but B left the work 3 days before its completion. However, in how many days was the overall work completed?

(SSC CGL Prelim Exam. 2008)

(a) 12 days (b) 10 days

(c) 9.6 days (d) 9 days

Explanation: Let the work be finished in x days.

According to the question, A worked for x days while B worked for $(x-3)$ days.

$$\therefore \quad \frac{x}{18}+\frac{x-3}{12}=1$$

$$\Rightarrow \quad \frac{2x+3x-9}{36}=1$$

$$\Rightarrow \quad 5x-9=36$$

$$\Rightarrow \quad 5x=45$$

$$\Rightarrow \quad x=\frac{45}{5}=9$$

Hence, the work was completed in 9 days. Hence, the correct option is (d).

37. 40 men can complete a work in 40 days. They started the work together. But at the end of each 10th day, 5 men left the job. The work would have been completed in **(SSC CGL Prelim Exam. 2008)**

(a) $56\frac{2}{3}$ days (b) $53\frac{1}{3}$ days

(c) 52 days (d) 50 days

Explanation: For the first 10 days 40 men worked.

Now, 40 men can complete the work in 40 days.

$\therefore$ 1 man will complete the same work in 1600 days.

$\therefore$ 1 man's 1 day work $= \frac{1}{1600}$

$\therefore$ Part of work done in first 10 days $= \frac{1}{4}$

For the next 10 days 35 men worked.

Part of the work done

$$= \frac{1\times 35\times 10}{1600} = \frac{7}{32}$$

For the next 10 days, 30 men worked

Part of the work done

$$= \frac{30\times 10}{1600} = \frac{3}{16}$$

For the next 10 days, 25 men worked. Part of the work done

$$= \frac{25\times 10}{1600} = \frac{5}{32}$$

Similarly, part of the work done by 20 men in next 10 days

$$= \frac{20\times 10}{1600} = \frac{1}{8}$$

Work done in 50 days

$$= \frac{1}{4}+\frac{7}{32}+\frac{3}{16}+\frac{5}{32}+\frac{1}{8}$$

$$= \frac{8+7+6+5+4}{32} = \frac{30}{32} = \frac{15}{16}$$

$\therefore$ Remaining work

$$= 1-\frac{15}{16} = \frac{1}{16}$$

Now 15 men remain to work.

15 men's 1 day work $= \frac{15}{1600}$

$\therefore$ Time taken to complete $\frac{1}{16}$ part of work

$$= \frac{1600}{15}\times\frac{1}{16} = \frac{20}{3} = 6\frac{2}{3}\text{ days}$$

$\therefore$ Total time $= 50 + 6\frac{2}{3}$

$$= 56\frac{2}{3}\text{ days}$$

Hence, the correct option is (a).

38. A and B can complete a piece of work in 12 and 18 days respectively. A begins to do the work and they work alternatively one at a time for one day each. The whole work will be completed in **(SSC CGL Prelim Exam. 2007)**

(a) $\frac{1}{3}$ 14 days (b) $15\frac{2}{3}$ days

(c) $16\frac{1}{3}$ days (d) $18\frac{2}{3}$ days

Explanation: A's 1 day work = $\frac{1}{12}$

B's 1 day work= $\frac{1}{18}$

Part of work done by A and B in first two days

$$=\frac{1}{12}+\frac{1}{18}=\frac{3+2}{36}=\frac{5}{36}$$

Part of work done by A and B in 14 days = $\frac{35}{36}$

[14 days to be taken randomly]

Remaining work = $1-\frac{35}{36}=\frac{1}{36}$

Now A will work for 15th day.

A will do the $\frac{1}{36}$ work in $\frac{1}{36}\times 12 = \frac{1}{3}$ day

$\therefore$ Total work will be done in $14\frac{1}{3}$ days.

Hence, the correct option is (a).

39. A man and a boy can complete a work together in 24 days. If for the last six days, when that man alone does the work then it is completed in 26 days. How long the boy will take to complete the work alone?

[(SSC SO (CA) Exam. 2005)]

(a) 72 days (b) 20 days

(c) 24 days (d) 36 days

Explanation: Suppose a man can complete the work in x days and that boy in y days.

According to the question,

$$\frac{24}{x}+\frac{24}{y}=1 \qquad \text{(i)}\times 13$$

$$\frac{26}{x}+\frac{20}{y}=1 \qquad \text{(ii)}\times 12$$

$$\frac{312}{x}+\frac{312}{y}=13$$

$$\frac{312}{x}+\frac{240}{y}=12$$

$$\frac{72}{y}=1$$

$\Rightarrow$ $y = 72$ days

$\therefore$ The boy alone can complete the work in 72 days.

Hence, the correct option is (a).

40. A and B together can complete a work in 8 days. B alone can complete that work in 12 days. B alone worked for four days. After that how long will A alone take to complete the work?

[SSC SO (CA) Exam. 2005]

(a) 15 days (b) 18 days

(c) 16 days (d) 20 days

Explanation: Time taken by A

$$=\frac{8\times 12}{128}=\frac{8\times 12}{4}=24 \text{ days}$$

Work done by $B=\frac{4}{12}=\frac{1}{3}$

Remaining work

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

$\because$ A can complete a work in 24 days

$\therefore$ A can complete $\frac{2}{3}$ part of work in $24\times\frac{2}{3}=16$ days

Hence, the correct option is (c).

41. A and B can do a work in 45 days and 40 days respectively. They began the work together but A left after some time and B completed the remaining work in 23 days. After how many days of the start of the work did A leave?

(SSC CPO S.I, Exam. 2004)

(a) 10 days (b) 9 days

(c) 8 days (d) 5 days

Explanation: $(A + B)$'s 1 day work

$$=\left(\frac{1}{45}+\frac{1}{40}\right)=\frac{8+9}{360}=\frac{17}{360}$$

Work done by B in 23 days

$$=\frac{1}{40}\times 23=\frac{23}{40}$$

Remaining work = $1-\frac{23}{40}=\frac{17}{40}$

Now, $\frac{17}{360}$ work was done by $(A + B)$ in 1 day.

$\therefore$ $\frac{17}{40}$ work was done by $(A + B)$ in $1\times\frac{360}{17}\times\frac{17}{40}=9$ days

Hence, A left after 9 days.

Hence, the correct option is (b).

42. A and B can do a piece of work in 20 days and 12 days respectively. A started the work alone and then after 4 days B joined him till the completion of the work. How long did the work last?

(SSC CGL Prelim Exam. 2004)

(a) 10 days (b) 20 days

(c) 15 days (d) 6 days

Explanation: A's 1 day work = $\frac{1}{20}$

A's 4 days' work = $\frac{4}{20}=\frac{1}{5}$

Remaining work = $1-\frac{1}{5}=\frac{4}{5}$

This part is completed by A and B together.

Now, $(A + B)$'s 1 day work

$$=\frac{1}{20}+\frac{1}{12}$$

$$=\frac{3+5}{60}=\frac{8}{60}=\frac{2}{15}$$

Now, $\frac{2}{15}$ work is done by $(A + B)$ in 1 day.

$\therefore$ $\frac{4}{5}$ work is done in $=\frac{15}{2}\times\frac{4}{5}=6$ days

Hence, the work lasted for 4 + 6 = 10 days

Hence, the correct option is (a).

43. A and B can complete a work in 15 days and 10 days respectively. They started doing the work together but after 2 days, B had to leave and A alone completed the remaining work. The whole work was completed in

(SSC CGL Prelim Exam. 2004)

(a) 10 days (b) 8 days

(c) 12 days (d) 15 days

Explanation: Work done by $(A + B)$ in 1 day

$$=\frac{1}{15}+\frac{1}{10}=\frac{2+3}{30}=\frac{5}{30}=\frac{1}{6}$$

$\therefore$ $(A + B)$'s 2 days' work = $\frac{2}{6}=\frac{1}{3}$

Remaining work

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

This part is done by A alone.

$\because$ One work is done by A in 15 days.

$\therefore$ $\frac{2}{3}$ work is done in $15\times\frac{2}{3}=10$ days

$\therefore$ Total number of days = 10 + 2 = 12 days

Hence, the correct option is (c).

44. A and B can do a piece of work in 28 and 35 days respectively. They began to work together but A leaves after sometime and B completed the remaining work in 17 days. After how many days did A leave? **(SSC CPO S.I, Exam. 2003)**

(a) $14\frac{2}{5}$ days (b) 9 days

(c) 8 days (d) $7\frac{5}{9}$ days

Explanation: Let A be worked for x days.

According to the question,

$$\frac{x}{28}+\frac{(x+17)}{35}=1$$

$$\Rightarrow \quad \frac{5x+4x(x+17)}{140}=1$$

$$\Rightarrow \quad 5x+4x+68=140$$

$$\Rightarrow \quad 9x=140-68=72$$

$$\Rightarrow \quad x=8$$

$\therefore$ A worked for 8 days.

Hence, the correct option is (c).

45. A and B working separately can do a piece of work in 10 days and 15 days respectively. If they work on alternate days beginning with A, in how many days will the work be completed? **(SSC CPO S.I, Exam. 2003)**

(a) 18 days (b) 13 days

(c) 12 days (d) 6 days

Explanation: Work done by $2(A + B)$ in one day

$$=\frac{1}{10}+\frac{1}{15}=\frac{3+2}{30}=\frac{5}{30}=\frac{1}{6}$$

$\therefore$ Work done by $(A + B)$ in one day $=\frac{1}{12}$

$\therefore$ $(A + B)$ can complete the work in 12 days.

Hence, the correct option is (c).

46. A certain number of persons can complete a piece of work in 55 days. If there were 6 persons more, the work could be finished in 11 days less. How many persons were originally there? **(SSC CGL Prelim Exam. 2003)**

(a) 17 (b) 24

(c) 30 (d) 22

Explanation: Originally, let there be x men.

Now, more men, less days, by proportionality

$$(x+6):x::55:44$$

So, $$\frac{x+6}{x}=\frac{55}{44}=\frac{5}{4}$$

$$\text{or } 5x=4x+24$$

$$\text{or } \quad x=24$$

Hence, the correct option is (b).

47. A can finish a work in 24 days, B in 9 days and C in 12 days. B and C started the work but are forced to leave after 3 days. The remaining work was done by A in **(SSC CGL Prelim Exam. 2003)**

(a) 5 days (b) 6 days

(c) 10 days (d) $10\frac{1}{2}$ days

Explanation: Work done by $(B + C)$ in 3 days.

$$=3\times\left(\frac{1}{9}+\frac{1}{12}\right)=\frac{1}{3}+\frac{1}{4}=\frac{4+3}{12}=\frac{7}{12}$$

Remaining work $=1-\frac{7}{12}=\frac{5}{12}$

This part of work is done by A alone.

Now, $\frac{1}{24}$ part of work is done by A in 1 day.

$\therefore$ $\frac{5}{12}$ part of work will be done by A in $=24\times\frac{5}{12}=10$ days.

Hence, the correct option is (c).

48. 8 men can do a work in 12 days. After 6 days of work, 4 more men were engaged to finish the work. In how many days would the remaining work be completed? **(SSC CGL Prelim Exam. 2003)**

(a) 2 (b) 3

(c) 4 (d) 5

Explanation: Work done by 8 men in 6 days $=\frac{6}{12}=\frac{1}{2}$

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

Therefore, 4 more men are engaged.

$\therefore$ Total number of men = 8 + 4 = 12

By using work and time formula,

$$\frac{W_1}{M_1D_1}=\frac{W_2}{M_2D_2}$$

$$\frac{1}{8\times12}=\frac{\frac{1}{2}}{12\times D_2}$$

$$\Rightarrow \quad D_2=\frac{1}{2}\times\frac{8\times12}{12}=4 \text{ days}$$

Hence, the correct option is (c).

49. A and B can do a piece of work in 30 days while B and C can do the same work in 24 days and C and A in 20 days. They all work together for 10 days when B and C leave. How many days more will A take to finish the work? **(SSC CPO S.I, Exam. 2003)**

(a) 18 days (b) 24 days

(c) 30 days (d) 36 days

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

$(B + C)$'s 1 day work $=\frac{1}{24}$

$(C + A)$'s 1 day work $=\frac{1}{20}$

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

$$=\frac{1}{30}+\frac{1}{24}+\frac{1}{20}$$

$$=\frac{4+5+6}{120}=\frac{15}{20}=\frac{1}{8}$$

$\therefore$ $(A + B + C)$'s 1 day work

$$=\frac{1}{16}$$

$\therefore$ $(A + B + C)$ s 10 days' work

$$=\frac{10}{16}=\frac{5}{8}$$

$\therefore$ Remaining work $=1-\frac{5}{8}=\frac{3}{8}$

This part of work is done by A alone.

Now A's 1 day work $=\frac{1}{16}-\frac{1}{24}$

$\therefore$ The required number of days

$$=\frac{3}{8}\times48=18 \text{ days}$$

Hence, the correct option is (a).

50. A and B can do a piece of work in 12 days and 15 days respectively. They began to work together but A left after 4 days. In how many more days would B alone complete the remaining work? **(SSC DEO Exam. 2000)**

(a) $\frac{20}{3}$ days (b) $\frac{25}{3}$ days

(c) 6 days (d) 5 days

Explanation: Part of the work done by A and B in 4 days

$$= 4\left(\frac{1}{12}+\frac{1}{15}\right) = 4\left(\frac{5+4}{60}\right)$$

$$= 4\times\frac{9}{60} = \frac{3}{5}$$

Remaining work $= 1-\frac{3}{5} = \frac{2}{5}$

$\therefore$ Time taken by B to complete the remaining work

$$= \frac{2}{5}\times 15 = 6 \text{ days}$$

Hence, the correct option is (c).

51. A and B can do a job in 6 and 12 days respectively. They began the work together but A leaves after 3 days. Then the total number of days needed for the completion of the work is

(SSC CGL Prelim Exam. 2000)

(a) 4 days (b) 5 days
(c) 6 days (d) 9 days

Explanation: A's 1 day work $= \frac{1}{6}$

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

$(A + B)$'s 1 day work

$$= \frac{1}{6}+\frac{1}{12} = \frac{2+1}{12} = \frac{1}{4}$$

$(A + B)$'s 3 day's work $= \frac{3}{4}$

Remaining work $= 1-\frac{3}{4} = \frac{1}{4}$

$\therefore$ Total required number of days

$$= \frac{1}{4}\times\frac{12}{1}+3 = 3+3 = 6 \text{ days}$$

Hence, the correct option is (c).

52. A can do a piece of work in 12 days and B can do it in 18 days. They work together for 2 days and then A leaves. How long will B take to finish the remaining work?

(SSC CGL Prelim Exam. 1999)

(a) 6 days (b) 8 days
(c) 10 days (d) 13 days

Explanation: $(A + B)$'s 2 days' work

$$= 2\left(\frac{1}{12}+\frac{1}{18}\right) = \frac{10}{36}$$

Remaining work

$$= 1-\frac{10}{36} = \frac{26}{36}$$

Time taken by B to complete $\frac{26}{36}$ part of work

$$= \frac{26}{36}\times 18 = 13 \text{ days}$$

Hence, the correct option is (d).

53. A and B can do a work in 18 and 24 days respectively. They worked together for 8 days and then A left. The remaining work was finished by B in

(SSC CGL Prelim Exam. 1999)

(a) 5 days (b) $5\frac{1}{3}$ days
(c) 8 days (d) 10 days

Explanation: A can finish the work in 18 days.

$\therefore$ A's 1 day work $= \frac{1}{18}$

Similarly, B's 1 day work $= \frac{1}{24}$

$\therefore$ $(A + B)$'s 8 days' work

$$= \left(\frac{1}{18}+\frac{1}{24}\right)\times 8 = \frac{7}{72}\times 8 = \frac{7}{9}$$

$\therefore$ Remaining work $= 1-\frac{7}{9} = \frac{2}{9}$

$\therefore$ Time taken to finish the remaining work by B is $\frac{2}{9}\times 24 = \frac{16}{3} = 5\frac{1}{3}$ days

Hence, the correct option is (b).

54. A can complete a piece of work in 10 days, B in 15 days and C in 20 days. A and C worked together for two days and then A was replaced by B. In how many days, altogether, was the work completed?

(SSC CGL Prelim Exam. 1999)

(a) 12 days (b) 10 days
(c) 6 days (d) 8 days

Explanation: Work done by $(A + C)$ in 2 days

$$= 2\left(\frac{1}{10}+\frac{1}{20}\right)$$

$$= 2\left(\frac{2+1}{20}\right) = \frac{6}{20} = \frac{3}{10}$$

Remaining work $= 1-\frac{3}{10} = \frac{7}{10}$

$(B + C)$'s 1 day work

$$= \frac{1}{15}+\frac{1}{20} = \frac{4+3}{60} = \frac{7}{60}$$

$\therefore$ Time taken by $(B + C)$ to finish $\frac{7}{10}$ part of the work

$$= \frac{60}{7}\times\frac{7}{10} = 6 \text{ days}$$

$\therefore$ Total time $= 2 + 6 = 8$ days

Hence, the correct option is (d).

Section III — Based on M man, W women and B boys

1. 8 children and 12 men complete a certain piece of work in 9 days. Each child takes twice the time taken by a man to finish the work. In how many days will 12 men finish the same work?

[SSC Constable (GD) Exam, 2015]

(a) 9 days (b) 13 days
(c) 12 days (d) 15 days

Explanation: 2 children = 1 man

$\therefore$ 8 children + 12 men = 16 men

$\therefore$ $M_1D_1 = M_2D_2$

$\Rightarrow$ $16\times 9 = 12\times D_2$

$\Rightarrow$ $D_2 = \frac{16\times 9}{12} = 12$ days.

Hence, the correct option is (c).

2. If 1 man or 2 women or 3 boys can do a piece of work in 44 days, then the same piece of work will be done by 1 man, 1 woman and 1 boy in

(SSC CGL Tier-I Re-Exam, 2015)

(a) 21 days (b) 24 days
(c) 26 days (d) 33 days

Explanation: 1 man = 2 women = 3 boys

$\therefore$ 1 man + 1 woman + 1 boy

$\equiv$ 3 boys + $\frac{3}{2}$ boys + 1 boy

$$\equiv \left(3+\frac{3}{2}+1\right)\text{boys} \equiv \frac{11}{2}\text{boys}$$

$\therefore$ By $M_1D_1 = M_2D_2$,

$$3\times 44 = \frac{11}{2}\times D_2$$

$\Rightarrow$ $D_2 = \frac{2\times 3\times 44}{11} = 24$ days

Hence, the correct option is (b).

3. 3 men or 7 women can do a piece of work in 32 days. The number of days required by 7 men and 5 women to do a piece of work twice as large is

[SSC CHSL (10+2) DEO & LDC Exam. 2014]

(a) 19 (b) 21

(c) 27 (d) 36

Explanation: ∵ 3 men = 7 women

$\therefore$ 7 men $= \frac{7\times7}{3} = \frac{49}{3}$ women

$\therefore$ 7 men + 5 women

$$= \left(\frac{49}{3}+5\right)\text{women}$$

$$= \left(\frac{49+15}{3}\right)\text{women}$$

$$= \frac{64}{3}\text{women}$$

$$\therefore \quad \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\Rightarrow \quad \frac{7\times32}{1} = \frac{64\times D_2}{3\times2}$$

$$\Rightarrow \quad D_2 = \frac{7\times32\times3\times2}{64}$$

$$= 21\text{ days}$$

Hence, the correct option is (b).

4. One man or two women or three boys can do a piece of work in 88 days. One man, one woman and one boy will do it in

(SSC CHSL DEO Exam. 2014)

(a) 44 days

(b) 24 days

(c) 48 days

(d) 20 days

Explanation: 1 man = 2 women = 3 boys

$\therefore$ 1 man + 1 woman + 1 boy

$$= \left(3+\frac{3}{2}+1\right)\text{boys}$$

$$= \left(\frac{6+3+2}{2}\right)\text{boys}$$

$$= \frac{11}{2}\text{boys}$$

$$M_1D_1 = M_2D_2$$

$$\Rightarrow \quad 3\times88 = \frac{11}{2}\times D_2$$

$$\Rightarrow \quad D_2 = \frac{3\times2\times88}{11} = 48\text{ days}$$

Hence, the correct option is (c).

5. A man is twice as fast as a woman and a woman is twice as fast as a boy in doing a work. If all of them, a man, a woman and a boy can finish the work in 7 days, in how many days a boy will do it alone?

(SSC CGL Tier-II Exam. 2014)

(a) 49 (b) 7

(c) 6 (d) 42

Explanation: According to the question,

1 man = 2 women = 4 boys

$\therefore$ 1 man + 1 woman + 1 boy

$$= (4 + 2 + 1)\text{ boys} = 7\text{ boys}$$

$$\therefore \quad M_1D_1 = M_2D_2$$

$$\Rightarrow \quad 7\times7 = 1\times D_2$$

$$\Rightarrow \quad D_2 = 49\text{ days}$$

Hence, the correct option is (a).

6. If 40 men or 60 women or 80 children can do a piece of work in 6 months, then 10 men, 10 women and 10 children together do half of the work in

(SSC CGL Tier-I Re-Exam. 2013 & 2014)

(a) $5\frac{6}{13}$ (b) 6 months

(c) $5\frac{7}{13}$ months (d) $11\frac{1}{13}$ months

Explanation: According to the question,

40 men = 60 women = 80 children

$\therefore$ 10 men $= \frac{80}{40}\times10$

$$= 20\text{ children}$$

$\therefore$ 10 women $= \frac{80}{60}\times10$

$$= \frac{40}{3}\text{ children}$$

$\therefore$ 10 men + 10 women + 10 children

$$= \left(20+\frac{40}{3}+10\right)\text{children}$$

$$= \left(\frac{60+40+30}{3}\right)\text{children}$$

$$= \frac{130}{3}\text{children}$$

$$\therefore \quad \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\Rightarrow \quad D_2 = \frac{80\times6\times13}{130} = \frac{144}{13}\text{months}$$

$\therefore$ Half of the work that can be done by 10 men, 10 women and 10 children

$$= \frac{144}{13}\times\frac{1}{2} = \frac{72}{13} = 5\frac{7}{13}\text{months}$$

Hence, the correct option is (c).

7. A man, a woman and a boy together finish a piece of work in 6 days. If a man and a woman can do the same work in 10 and 24 days respectively then the number of days taken by a boy to finish the work is

(SSC CGL Tier-I Re-Exam. 2013 & 2014)

(a) 30 (b) 35

(c) 40 (d) 45

Explanation: Time taken by boy = x days

$$\therefore \quad \frac{1}{10}+\frac{1}{24}+\frac{1}{x} = \frac{1}{6}$$

$$\Rightarrow \quad \frac{1}{x} = \frac{1}{6}-\frac{1}{10}-\frac{1}{24}$$

$$= \frac{20-12-5}{120} = \frac{3}{120} = \frac{1}{40}$$

$$\Rightarrow \quad x = 40\text{ days}$$

Hence, the correct option is (c).

8. Three men can complete a piece of work in 6 days. Two days after they started the work, 3 more men joined them. How many days will they take to complete the remaining work?

(SSC CHSL DEO & LDC Exam. 2013)

(a) 1 days (b) 2 days

(c) 3 days (d) 4 days

Explanation: Work done in two days = $\frac{1}{6}\times2 = \frac{1}{3}$, remaining work = $\frac{2}{3}$

$$\Rightarrow \quad \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\Rightarrow \quad \frac{3\times2}{\frac{1}{3}} = \frac{6\times D_2}{\frac{2}{3}}$$

$$\Rightarrow \quad D_2 = \frac{3\times2\times2}{6} = 2\text{ days}$$

Hence, the correct option is (b).

9. If 4 men or 6 women can do a piece of work in 12 days working 7 hours a day; how many days will it take to complete a work twice as large with 10 men and 3 women working together 8 hours a day?

(SSC CHSL DEO & LDC Exam. 2013)

(a) 6 days

(b) 7 days

(c) 8 days

(d) 10 days

Explanation:

1 men a $\equiv \frac{6}{4} = \frac{3}{2}$ women

10 men + 3 women

$= 10 \times \frac{3}{2} + 3 = 18$ women

$\therefore \quad \frac{M_1 D_1 T_1}{W_1} = \frac{M_2 D_2 T_2}{W_2}$

$\Rightarrow \quad \frac{6 \times 12 \times 7}{1} = \frac{18 \times D_2 \times 8}{W_2}$

$\Rightarrow \quad D_2 = \frac{6 \times 12 \times 7 \times 2}{18 \times 8} = 7$ days

Hence, the correct option is (b).

10. 3 men or 5 women can do a work in 12 days. How long will 6 men and 5 women take to finish the work?

[(SSC CPO S.I, Exam. 2006) & (SSC GL Tier-I Exam. 2013)]

(a) 20 days (b) 10 days

(c) 4 days (d) 15 days

Explanation: 3 men's work = 5 women's work

1 man's work = $\frac{5}{3}$ women's work

$\therefore$ 6 men's work = $\frac{5}{3} \times 6$

= 10 women's work

$\therefore$ 6 men + 5 women = 15 women

$\therefore$ 5 women can do the work in 12 days.

Hence, 15 women can do it in

$\frac{5 \times 12}{15} = 4$ days

Hence, the correct option is (c).

11. 2 men and 3 boys can do a piece of work in 10 days while 3 men and 2 boys can do the same work in 8 days. In how many days can 2 men and 1 boy do the work?

(SSC GL Tier-I Exam. 2013)

(a) 8 days (b) 7 days

(c) $12\frac{1}{2}$ days (d) 2 days

Explanation: According to the question,

20 men + 30 boys = 24 men + 16 boys

4 men = 14 boys

$\Rightarrow$ 2 men = 7 boys

$\Rightarrow$ 2 men + 1 boy = 8 boys

$\Rightarrow$ 2 men + 3 boys = 10 boys

By $M_1 D_1 = M_2 D_2$

$\Rightarrow \quad 10 \times 10 = 8 \times D_2$

$\Rightarrow \quad D_2 = \frac{10 \times 10}{8} = \frac{25}{2}$

$= 12\frac{1}{2}$ days

Hence, the correct option is (c).

12. If 8 men or 12 boys can do a piece of work in 16 days, the number of days required to complete the work by 20 men and 6 boys is

(SSC GL Tier-I Exam. 2013)

(a) $5\frac{1}{3}$ days (b) $6\frac{1}{3}$ days

(c) $8\frac{1}{3}$ days (d) $7\frac{1}{3}$ days

Explanation: $\because$ 8 men = 12 boys

$\therefore \quad$ 4 men = 6 boys

$\Rightarrow \quad$ 20 men = 30 boys

$\Rightarrow \quad$ 20 men + 6 boys = 36 boys

$\therefore \quad M_1 D_1 = M_2 D_2$

$\Rightarrow \quad 12 \times 16 = 36 \times D_2$

$\Rightarrow \quad D_2 = \frac{12 \times 16}{36} = \frac{16}{3} = 5\frac{1}{3}$ days

Hence, the correct option is (a).

13. If 10 men or 20 women or 40 children can do a piece of work in 7 months, then 5 men, 5 women and 5 children together can do half of the work in

(SSC GL Tier-I Exam. 2013)

(a) 6 months (b) 4 months

(c) 5 months (d) 8 months

Explanation: 10 men = 20 women

1 man = 2 women = 5 children

1 woman = 2 children

$\therefore$ 5 men + 5 women + 5 children

= 20 + 10 + 5 = 35 children

$\therefore \quad M_1 D_1 = M_2 D_2$

$\Rightarrow \quad 40 \times 7 = 35 \times D_2$

$\Rightarrow \quad D_2 = \frac{40 \times 7}{35} = 8$ months

$\therefore$ 5 men, 5 women and 5 children can do half of the work in 8 months.

Therefore, required time = 4 months

Hence, the correct option is (d).

14. 3 men and 4 boys can complete a piece of work in 12 days. 4 men and 3 boys can do the same work in 10 days. Then 2 men and 3 boys can finish the work in

(SSC GL Tier-I Exam. 2012)

(a) $17\frac{1}{2}$ days (b) $5\frac{5}{11}$ days

(c) 8 days (d) 22 days

Explanation: 12 (3 men + 4 boys) = 10 (4 men + 3 boys)

$\Rightarrow$ 36 men + 48 boys = 40 men + 30 boys

$\Rightarrow \quad$ 4 men = 18 boys

$\Rightarrow \quad$ 2 men = 9 boys

$\therefore$ 4 men + 3 boys = 21 boys, who do the work in 10 days and 2 men + 3 boys = 12 boys.

$\therefore \quad M_1 D_1 = M_2 D_2$

$\Rightarrow \quad 21 \times 10 = 12 \times D_2$

$\Rightarrow \quad D_2 = \frac{21 \times 10}{12} = \frac{35}{2} = 17\frac{1}{2}$ days

Hence, the correct option is (a).

15. 3 men and 4 boys can complete a piece of work in 12 days. 4 men and 3 boys can do the same work in 10 days. Then 2 men and 3 boys can finish the work in how many days?

(SSC GL Tier-I Exam. 2012)

(a) $17\frac{1}{2}$ days (b) $5\frac{5}{11}$ days

(c) 8 days (d) 22 days

Explanation: 12 (3 men + 4 boys)

= 10 (4 men + 3 boys)

$\Rightarrow$ 36 men + 48 boys

= 40 men + 30 boys

$\Rightarrow \quad$ 4 men = 18 boys

or 2 men = 9 boys

$\therefore$ 4 men + 3 boys = 21 boys who do the work in 10 days and 2 men + 3 boys = 12 boys

$\therefore \quad M_1 D_1 = M_2 D_2$

$\Rightarrow \quad 21 \times 10 = 12 \times D_2$

$\Rightarrow \quad \frac{21 \times 10}{12} = \frac{35}{2} = 17\frac{1}{2}$ days

Hence, the correct option is (a).

16. 6 men and 8 women can do a work in 10 days. Then 3 men and 4 women can do the same work in

(SSC CHSL DEO & LDC Exam. 2011)

(a) 24 days (b) 20 days

(c) 12 days (d) 18 days

Explanation: $6m + 8w \equiv 10$ days

$\Rightarrow \quad 2(3m + 4w) \times 10$ days

$\Rightarrow \quad 3m + 4w = 20$ days

Since the workforce has become half of the original force, so the number of days must be double.

Hence, the correct option is (b).

17. 2 men and 3 women can do a piece of work in 10 days while 3 men and 2 women can do the same work in 8 days. Then, 2 men and 1 woman can do the same work in

(SSC CHSL DEO & LDC Exam. 04.12.2011)

(a) 12 days (b) $12\frac{1}{2}$ days.

(c) 13 days (d) $13\frac{1}{2}$ days

Explanation: 2×10 men $+ 3 \times 10$ women

$= 3 \times 8$ men $+ 2 \times 8$ women

$\Rightarrow \quad 20$ men $+ 30$ women

$= 24$ men $+ 16$ women

$\Rightarrow \quad 4$ men $= 14$ women

or $\quad 2$ men $= 7$ women

$\therefore \quad 2$ men $+ 3$ women $= 10$ women

$\therefore \quad 2$ men $+ 1$ woman $= 8$ women

$\therefore \quad M_1D_1 = M_2D_2$

$\Rightarrow \quad 10 \times 10 = 8 \times D_2$

$\Rightarrow \quad D_2 = \frac{25}{2} = 12\frac{1}{2}$ days

Hence, the correct option is (b).

18. One man and one woman together can complete a piece of work in 8 days. A man alone can complete the work in 10 days. In how many days can one woman alone complete the work?

(SSC CPO S.I, Exam 2010)

(a) $\frac{140}{9}$ days (b) 30 days

(c) 40 days (d) 42 days

Explanation: Work done by 1 woman in 1 day

$$= \frac{1}{8} - \frac{1}{10} = \frac{5-4}{40} = \frac{1}{40}$$

$\therefore$ One woman will complete the work in 40 days.

Hence, the correct option is (c).

19. If 1 man or 2 women or 3 boys can complete a piece of work in 88 days, then 1 man, 1 woman and 1 boy together will complete it in

(SSC CHSL DEO & LDC Exam. 2010)

(a) 36 days (b) 42 days

(c) 48 days (d) 54 days

Explanation: 1 man = 2 women = 3 boys

1 man + 1 woman + 1 boy

$$= \left(3 + \frac{3}{2} + 1\right)\text{boys} = \frac{11}{2}\text{boys}$$

$\therefore \quad M_1D_1 = M_2D_2$

$\Rightarrow \quad 3 \times 88 = \frac{11}{2} \times D_2$

$\Rightarrow \quad D_2 = \frac{2 \times 3 \times 88}{11} = 48$ days

Hence, the correct option is (c).

20. A man, a woman and a boy can complete a work in 20 days, 30 days and 60 days respectively. How many boys must assist 2 men and 8 women so as to complete the work in 2 days?

(SSC DEO Exam. 2009)

(a) 8 (b) 12

(c) 4 (d) 6

Explanation: Part of work done by 2 men and 2 women in 2 days

$$= 2\left(\frac{2}{20} + \frac{8}{30}\right)$$

$$= 2\left(\frac{1}{10} + \frac{8}{30}\right) = 2\left(\frac{3+8}{30}\right)$$

$$= \frac{22}{30} = \frac{11}{15}$$

Remaining work $= 1 - \frac{11}{15} = \frac{4}{15}$

Work done by 1 boy in 2 days

$$= \frac{2}{60} = \frac{1}{30}$$

$\therefore$ Number of boys required to assist $= \frac{4}{15} \times 30 = 8$

Hence, the correct option is (a).

21. A man, a woman and a boy can together complete a piece of work in 3 days. If a man alone can do it in 6 days and a boy alone in 18 days, how long will a woman alone take to complete the work?

(SSC CGL Prelim Exam. 2005)

(a) 9 days (b) 21 days

(c) 24 days (d) 27 days

Explanation: Work done by 1 woman in 1 day

$$= \frac{1}{3} - \frac{1}{6} - \frac{1}{18}$$

$$= \frac{6-3-1}{18} = \frac{1}{9}$$

$\therefore$ Woman will do the work in 9 days.

Hence, the correct option is (a).

22. 6 men or 12 women can do a piece of work in 20 days. In how many days can 8 men and 16 women do twice as big as this work? **(SSC CGL Prelim Exam. 2004)**

(a) 2 days (b) 5 days

(c) 15 days (d) 10 days

Explanation: 6 men = 12 women

$\therefore$ 1 man = 2 women

Now, 8 men + 16 women

$= (8 \times 2 + 16)$ women

$= 32$ women

$\because$ 12 women can do a work in 20 days.

$\therefore$ 1 woman can do the work in 20×12 days.

$\therefore$ 32 women can do the twice work in

$$= \frac{20 \times 12 \times 2}{32} = 15 \text{ days}$$

Hence, the correct option is (c).

23. 4 men and 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it?

(SSC CGL Prelim Exam. 2004)

(a) 50 days (b) 45 days

(c) 40 days (d) 35 days

Explanation: Let 1 man's 1 day work $= x$ and 1 woman's 1 day work $= y$

Then, $4x + 6y = \frac{1}{8}$ and $3x + 7y = \frac{1}{10}$

From both equations, we get $y = \frac{1}{400}$

$\therefore$ 10 women's 1 day's work

$$= \frac{10}{100} = \frac{1}{40}$$

$\therefore$ 10 women will finish the work in 40 days.
Hence, the correct option is (c).

24. If 3 men or 4 women can plough a field in 43 days, how long will 7 men and 5 women take to plough it?
(SSC CGL Prelim Exam. 2003)

(a) 10 days (b) 11 days
(c) 9 days (d) 12 days

Explanation: $\because$ 3 men = 4 women

$$\therefore \quad 1\text{man} = \frac{4}{3}\text{women}$$

$$\therefore \quad 7\text{men} = \frac{7\times 4}{3} = \frac{28}{3}\text{women}$$

$$\therefore \quad 7\text{men} + 5\text{women} = \frac{28}{3} + 5$$

$$= \frac{28+15}{3} = \frac{43}{3}\text{Women}$$

Now, $M_1D_1 = M_2D_2$

$$\Rightarrow \quad 4\times 43 = \frac{43}{3}\times D_2,$$

where D_2 = number of days

$$\Rightarrow \quad D_2 = \frac{4\times 3\times 43}{43} = 12 \text{ days.}$$

Hence, the correct option is (d).

25. If 5 men or 8 women can do a piece of work in 12 days, how many days will be taken by 2 men and 4 women to do the same work? **(SSC CGL Prelim Exam. 2002)**

(a) 15 days (b) $13\frac{1}{2}$ days
(c) $13\frac{1}{3}$ days (d) 10 days

Explanation: According to the question, 5 men = 8 women

$$\therefore \quad 2\text{ men} = \frac{8}{5}\times 2 = \frac{16}{5}\text{women}$$

$$\text{Total women} = \frac{16}{5} + 4$$

$$= \frac{36}{5} \text{ women}$$

$\therefore$ Number of days to do the same work

$$= \frac{8\times 12}{\frac{36}{5}} = \frac{8\times 12\times 5}{36}$$

$$= \frac{40}{3} = 13\frac{1}{3}\text{days}$$

Hence, the correct option is (c).

26. If 3 men or 6 women can do a piece of work in 16 days, in how many days can 12 men and 8 women do the same piece of work? **(SSC CGL Prelim Exam. 2000)**

(a) 4 days (b) 5 days
(c) 3 days (d) 2 days

Explanation: $3m = 6w$

$$\therefore \quad 1m = 2w$$

$$12m + 8w = (12\times 2w) + 8w = 32w$$

$\therefore$ 6 women can do the work in 16 days.
$\therefore$ 32 women can do the work in $\frac{16\times 6}{32} = 3$ days
Hence, the correct option is (c).

27. A man, a woman and a boy can complete a job in 3, 4 and 12 days respectively. How many boys must assist 1 man and 1 woman to complete the job in $\frac{1}{4}$ of a day? **(SSC CGL Prelim Exam. 2000)**

(a) 1 (b) 4
(c) 19 (d) 41

Explanation: 1 man's 1 day work = $\frac{1}{3}$

1 woman's 1 day work = $\frac{1}{4}$

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

(1 man + 1 woman)'s $\frac{1}{4}$ day's work

$$= \frac{1}{4}\left(\frac{1}{3} + \frac{1}{4}\right) = \frac{7}{48}$$

$$\text{Remaining work} = 1 - \frac{7}{48} = \frac{41}{48}$$

Now,

$$1 \text{ boy's } \frac{1}{4} \text{ day's work} = \frac{1}{4}\times\frac{1}{12} = \frac{1}{48}$$

$\therefore$ $\frac{41}{48}$ work will be done by $\frac{41}{48}\times 48 = 41$ boys.
Hence, the correct option is (d).

28. If 16 men or 20 women can do a piece of work in 25 days. In what time will 28 men and 15 women do it? **(SSC CGL Prelim Exam. 2000)**

(a) $14\frac{2}{7}$ days (b) $33\frac{1}{3}$ days
(c) $18\frac{3}{4}$ days (d) 10 days

Explanation: 16 men = 20 women

4 men = 5 women

Now, according to the question, 16 men can complete the work in 25 days.

$$\therefore \text{ 1 man's 1 day work} = \frac{1}{25\times 16}$$

$\therefore$ 4 men's 1 day work

$$= \frac{4}{25\times 16} = \frac{1}{100}$$

Similarly,
1 woman's 1 day work

$$\frac{1}{25\times 20}$$

$\therefore$ 5 women's one day work

$$= \frac{5}{25\times 20} = \frac{1}{100}$$

$$\therefore \quad 28\text{men} = \frac{28}{4}\times 5 = 35\text{women}$$

[28 men + 15 women]

$\therefore$ 50 women's 1 day work

$$= \frac{50}{25\times 20} = \frac{1}{10}$$

Therefore, 28 men and 15 women can complete the whole work in 10 days.
Hence, the correct option is (d).

29. 5 men can do a piece of work in 6 days while 10 women can do it in 5 days. In how many days can 5 women and 3 men do it? **(SSC CGL Prelim Exam. 1999)**

(a) 4 days (b) 5 days
(c) 6 days (d) 8 days

Explanation: 5×6 men = 10×5 women

$$\Rightarrow \quad 3 \text{ men} = 5 \text{ women}$$

$\therefore$ 5 women + 3 men = 6 men
$\because$ 5 men complete the work in 6 days.
$\therefore$ 6 men will complete the work in $\frac{5\times 6}{6} = 5$ days
Hence, the correct option is (b).

30. If 6 men and 8 boys can do a piece of work in 10 days and 26 men and 48 boys can do the same in 2 days, then the time taken by 15 men and 20 boys to do the same type of work will be: **(SSC CGL Prelim Exam. 1999)**

(a) 5 days
(b) 4 days
(c) 6 days
(d) 7 days

Explanation: According to the question,

$$(6M + 8B) \times 10 = (26M + 48B) \times 2$$

$\therefore \quad 60M + 80B = 52M + 96B$

or, $\quad 1M = 2B$

$\therefore \quad 15M + 20B = (30 + 20)B$

= 50 boys and $6M + 8B = (12 + 8)$ boys = 20 boys

$\because$ 20 boys can finish the work in 10 days.

$\therefore$ 50 boys can finish the work in

$$\frac{20 \times 10}{50}\text{days} = 4 \text{ days}$$

Hence, the correct option is (b).

31. If 10 men or 20 boys can make 260 mats in 20 days, then how many mats will be made by 8 men and 4 boys in 20 days?

(SSC CGL Prelim Exam. 1999)

(a) 260 (b) 240

(c) 280 (d) 520

Explanation: 10 men = 20 boys

$\therefore$ 1 man = 2 boys

$\therefore$ 8 men + 4 boys = (16 + 4) boys = 20 boys

Hence, 8 men and 5 boys will make 260 mats in 20 days.

Hence, the correct option is (a).

Section IV — Fraction of Work

1. Janardan completes $\frac{2}{3}$ of his work in 10 days. Time he will take to complete $\frac{3}{5}$ of the same work, is

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015)

(a) 8 days (b) 6 days

(c) 9 days (d) 4 days

Explanation: Let the amount of work be x

Now we have

$$\left(\frac{2}{3}\right)x = 10$$

$$x = 15$$

Now time required to do 3/5 of same work $= \left(\frac{3}{5}\right) \times 15 = 9$ days

Hence, the correct option is (c).

2. A contractor was engaged to construct a road in 16 days. After working for 12 days with 20 labours it was found that only $\frac{5}{8}$ th of the road had been constructed. To complete the work in stipulated time the number of extra labours required is

[SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015]

(a) 18 (b) 10

(c) 12 (d) 16

Explanation: Remaining work $= 1 - \frac{5}{8} = \frac{3}{8}$

Remaining time = 4 days

$$\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\Rightarrow \quad \frac{20 \times 12}{\frac{5}{8}} = \frac{M_2 \times 4}{\frac{3}{8}}$$

$$\Rightarrow \quad \frac{20 \times 12}{5} = \frac{M_2 \times 4}{3}$$

$$\Rightarrow \quad 4 \times 12 = \frac{M_2 \times 4}{3}$$

$$\Rightarrow \quad M_2 = 12 \times 3$$

Number of additional workers = 36 − 20 = 16

$$\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\Rightarrow \quad \frac{10}{\frac{2}{3}} = \frac{D_2}{\frac{3}{5}}$$

$$\Rightarrow \quad \frac{30}{2} = \frac{5D_2}{3}$$

$$D_2 = \frac{30}{2} \times \frac{3}{5} = 9 \text{ days}$$

Hence, the correct option is (d).

3. If 12 men working 8 hours a day complete the work in 10 days, how long would 16 men working $7\frac{1}{2}$ hours a day take to complete the same work?

[SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015]

(a) 7 (b) 6

(c) 10 (d) 8

Explanation:

Men	Working hours	Days
12 ↑	8	10 ↓
16	$7\frac{1}{2}$ ↑	x

$$\left.\begin{matrix} 16:12 \\ \frac{15}{2}:8 \end{matrix}\right\} :: 10 : x$$

$$\Rightarrow \quad 16 \times \frac{15}{2} \times x = 12 \times 8 \times 10$$

$$\Rightarrow \quad 8 \times 15 \times x = 12 \times 8 \times 10$$

$$\Rightarrow \quad x = \frac{12 \times 8 \times 10}{8 \times 15} = 8 \text{ days}$$

Hence, the correct option is (d).

4. A can do in one day three times the work done by B in one day. They together finish $2\frac{2}{5}$ of the work in 9 days. The number of days by which B can do the work alone is

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015)

(a) 90 days (b) 120 days

(c) 100 days (d) 30 days

Explanation: Let the time taken by A alone in doing the work be x days.

$\therefore$ Time taken by B alone = $3x$ days

$\because$ A and B together finish $\frac{2}{5}$ work in 9 days.

$\therefore$ Time taken by A and B in doing whole work

$$= \frac{9 \times 5}{2} = \frac{45}{2}\text{days}$$

$$\therefore \quad \frac{1}{x} + \frac{1}{3x} = \frac{2}{45}$$

$$\Rightarrow \quad \frac{3+1}{3x} = \frac{2}{45}$$

$$\Rightarrow \quad \frac{4}{3x} = \frac{2}{45}$$

$$\Rightarrow \quad 2 \times 3x = 4 \times 45z$$

$$\Rightarrow \quad x = \frac{4 \times 45}{2 \times 3} = 30 \text{ days}$$

$\therefore$ Time taken by $B = 3x$ days = 3 × 30 = 90 days

Hence, the correct option is (a).

5. 4 men and 6 women complete a work in 8 days. 2 men and 9 women also complete in 8 days in which, the number of days in which 18 women complete the work is **(SSC CGL Tier-I Exam. 2015)**

(a) $4\frac{1}{3}$ days (b) $5\frac{1}{3}$ days

(c) $4\frac{2}{3}$ days (d) $5\frac{2}{3}$ days

Explanation: According to the question,

(4×8) men + (6×8) women = (2×8) men + (9×8) women

$\Rightarrow$ 4 men + 6 women = 2 men + 9 women

$\Rightarrow$ $(4-2)$ men = $(9-6)$ women

$\Rightarrow$ 2 men = 3 women

$\therefore$ 4 men + 6 women = 12 women

$\therefore$ $M_1D_1 = M_2D_2$

$\Rightarrow$ $12\times 8 = 18\times D_2$

$\Rightarrow$ $D_2 = \frac{12\times 8}{18} = \frac{16}{3} = \frac{9x}{10}$ days

Hence, the correct option is (b).

6. A can do a work in 10 days and B in 20 days. If they together work on it for 5 days, then the fraction of the work that is left is **(SSC CGL Tier-I Exam, 2015)**

(a) $\frac{3}{4}$ (b) $\frac{4}{3}$

(c) $\frac{3}{20}$ (d) $\frac{1}{4}$

Explanation: Work done by A and B in 1 day

$$= \frac{1}{10}+\frac{1}{20} = \frac{2+1}{20} = \frac{3}{20}$$

$\therefore$ $(A + B)$'s 5 days' work

$$= \frac{5\times 3}{20} = \frac{3}{4}$$

$\therefore$ Remaining work $= 1-\frac{3}{4} = \frac{1}{4}$

Hence, the correct option is (d).

7. A, B and C are employed to do a piece of work for ₹5290. A and B together are supposed to do $\frac{19}{23}$ of the work and B and C together $\frac{8}{23}$ of the work. Then A should be paid **(SSC CGL Tier-II Exam, 2014 & 2015)**

(a) ₹4,250 (b) ₹3,450

(c) ₹1,950 (d) ₹2,290

Explanation: Part of work done by A and $B = \frac{19}{23}$

$\therefore$ Part of work done by C

$$= 1-\frac{19}{23} = \frac{4}{23}$$

Part of work done by B and $C = \frac{8}{23}$

$\therefore$ Part of work done by B

$$= \frac{8}{23}-\frac{4}{23} = \frac{4}{23}$$

$\therefore$ Part of work done by A

$$= \frac{19}{23}-\frac{4}{23} = \frac{15}{23}$$

$\therefore$ Ratio of the shares of wages of A, B and C

$$= \frac{15}{23}:\frac{4}{23}:\frac{4}{23} = 15:4:4$$

$\therefore$ A's share

$$= \frac{15}{23}\times 5290 = ₹3450$$

Hence, the correct option is (b).

8. A does half as much work as B in three fourth of the time. If together they take 18 days to complete the work, how much time will B alone take to do it? **(SSC CGL Tier-II Exam, 2014 & 2015)**

(a) 40 days (b) 45 days

(c) 50 days (d) 30 days

Explanation: Let the time taken by B in doing the work alone = x days.

According to the question,

Time taken by A

$$= 2\times\frac{3x}{4} = \frac{3x}{2}\text{ days}$$

$\therefore$ $\frac{1}{x}+\frac{1}{\frac{3x}{2}} = \frac{1}{18}$

$\Rightarrow$ $\frac{1}{x}+\frac{2}{3x} = \frac{1}{18}$

$\Rightarrow$ $\frac{3+2}{3x} = \frac{1}{18}$

$\Rightarrow$ $3x = 18\times 5$

$\Rightarrow$ $x = \frac{18\times 5}{3} = 30\text{ days}$

Hence, the correct option is (d).

9. x does $\frac{1}{4}$ of a job in 6 days. y completes the rest of the job in 12 days. Then x and y could complete the job together in **(SSC CGL Tier-II Exam. 2015)**

(a) 9 days (b) $9\frac{3}{5}$ days

(c) $8\frac{1}{8}$ days (d) $7\frac{1}{3}$ days

Explanation: x does $\frac{1}{4}$ work in 6 days.

$\therefore$ x does 1 work in 24 days.

Similarly,

y does $\frac{3}{4}$ work in 12 days.

$\therefore$ y does 1 work in $\frac{12\times 4}{3} = 16$ days

$(x + y)$'s 1 day work

$$= \frac{1}{24}+\frac{1}{16} = \frac{2+3}{48} = \frac{5}{48}$$

$\therefore$ Required time $= \frac{48}{5}$

$$= 9\frac{3}{5}\text{days}$$

Hence, the correct option is (b).

10. A company employed 200 workers to complete a certain work in 150 days. If only one-fourth of the work has been done in 50 days, then in order to complete the whole work in time, the number of additional workers to be employed was **(SSC CGL Tier-II Exam. 2015)**

(a) 100 (b) 300

(c) 600 (d) 200

Explanation: 200 workers do $\frac{1}{4}$ work in 50 days.

How many workers will do $\frac{3}{4}$ work in 100 days?

Number of additional workers = x (Assume)

$\therefore$ $\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$

$\Rightarrow$ $\frac{200\times 50}{\frac{1}{4}} = \frac{(200+x)\times 100}{\frac{3}{4}}$

$\Rightarrow$ $(200+x)100 = 3\times 200\times 50$

$\Rightarrow$ $200 + x = 300$

$\Rightarrow$ $x = 300 - 200 = 100$

Hence, the correct option is (a).

11. Two workers A and B are engaged to do a piece of work. A working alone would take 8 hours more to complete the work than when work together. If B worked alone, then it would take $4\frac{1}{2}$ hours more

than when work together. The time required to finish the work together is

(SSC CGL Tier-II Exam. 2015)

(a) 5 hours (b) 4 hours

(c) 8 hours (d) 6 hours

Explanation: Time taken by A and B = x hours (Assume).

$\therefore$ According to the question, time taken by A alone = $(x + 8)$ hours.

Time taken by B alone

$$= \left(x + \frac{9}{2}\right) \text{hours.}$$

$$\therefore \quad \frac{1}{x+8} + \frac{1}{x+\frac{9}{2}} = \frac{1}{x}$$

$$\Rightarrow \quad \frac{1}{x+8} + \frac{2}{2x+9} = \frac{1}{x}$$

$$\Rightarrow \quad \frac{2x+9+2x+16}{(x+8)(2x+9)} = \frac{1}{x}$$

$$\Rightarrow \quad \frac{4x+25}{2x^2+16x+9x+72} = \frac{1}{x}$$

$$\Rightarrow \quad 4x^2 + 25x = 2x^2 + 25x + 72$$

$$\Rightarrow \quad 2x^2 = 72 \Rightarrow x^2 = \frac{72}{2} = 36$$

$$\Rightarrow \quad x = \sqrt{36} = 6 \text{ hours}$$

Hence, the correct option is (d).

12. A can do $\frac{7}{8}$ of work in 28 days; B can do $\frac{5}{6}$ of the same work in 20 days. The number of days they will take to complete if they do it together is

(SSC CAPFs SI, CISF ASI & DP SI Exam. 2014)

(a) $15\frac{3}{7}$ days (b) $17\frac{3}{5}$ days

(c) $14\frac{5}{7}$ days (d) $13\frac{5}{7}$ days

Explanation: A does $\frac{7}{8}$ work in 28 days.

$\therefore$ A will complete the work in $28 \times \frac{8}{7} = 32$ days

B does $\frac{5}{6}$ work in 20 days.

$\therefore$ B will complete the work in

$$= \frac{20 \times 6}{5} = 24 \text{ days}$$

$\therefore$ $(A+B)$'s 1 day work

$$= \frac{1}{32} + \frac{1}{24} = \frac{3+4}{96} = \frac{7}{96}$$

$\therefore$ Required time

$$= \frac{96}{7} = 13\frac{5}{7} \text{ days}$$

Hence, the correct option is (d).

13. A can do one and a half as much of a work which B can do in one day. B alone can do a piece of work in 18 days. They together can finish that work in

(SSC Multi-Tasking Staff Exam. 2013)

(a) $10\frac{1}{5}$ days (b) $11\frac{1}{5}$ days

(c) $5\frac{1}{5}$ days (d) $7\frac{1}{5}$ days

Explanation: Ratio of efficiency of A and B = 3 : 2

Ratio of time taken = 2 : 3

$\therefore$ Time taken by A

$$= \frac{2}{3} \times 18 = 12 \text{ days}$$

$\therefore$ $(A+B)$'s 1 day work

$$= \frac{1}{12} + \frac{1}{18} = \frac{3+2}{36} = \frac{5}{36}$$

$\therefore$ Required time

$$= \frac{36}{5} = 7\frac{1}{5} \text{ days}$$

Hence, the correct option is (d).

14. A can do a work in 20 days and B in 40 days. If they work on it together for 5 days, then the fraction of the work that is left is:

(SSC CHSL DEO & LDC Exam. 2012)

(a) $\frac{5}{8}$ (b) $\frac{8}{15}$

(c) $\frac{7}{15}$ (d) $\frac{1}{10}$

Explanation: $(A + B)$'s 5 days' work

$$= 5\left(\frac{1}{20} + \frac{1}{40}\right)$$

$$= 5\left(\frac{2+1}{40}\right) = \frac{15}{40} = \frac{3}{8}$$

$\therefore$ Remaining work = $1 - \frac{3}{8} = \frac{5}{8}$

Hence, the correct option is (a).

15. A alone can do a piece of work in 20 days and B alone in 30 days. They begin to work together. They will finish half of the work in

(SSC CHSL DEO & LDC Exam. 2012)

(a) 8 days (b) 9 days

(c) 12 days (d) 6 days

Explanation: $(A + B)$'s 1 day work

$$= \frac{1}{20} + \frac{1}{30} = \frac{3+2}{60} = \frac{1}{12}$$

$\therefore$ Work done in 6 days = $\frac{6}{12} = \frac{1}{2}$

Hence, the correct option is (d).

16. A can do $\frac{1}{6}$ of a work in 5 days and B can do $\frac{2}{5}$ of the work in 8 days. In how many days, can both A and B together do the work?

[SSC Constable (GD) & Rifleman (GD) Exam. 2012]

(a) 12 days (b) 13 days

(c) 15 days (d) 20 days

Explanation: Time taken by A to finish the work = $5 \times 6 = 30$ days

Time taken by B to complete the work = $\frac{8 \times 5}{2} = 20$ days

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{30} + \frac{1}{20} = \frac{2+3}{60} = \frac{1}{12}$$

$\therefore$ Required time = 12 days

Hence, the correct option is (a).

17. A does half as much work as B in one-third of the time taken by B. If together they take 10 days to complete a work, then the time taken by B alone to do it would have been (SSC CHSL DEO & LDC Exam. 2011)

(a) 30 days (b) 25 days

(c) 6 days (d) 12 days

Explanation: If B completes a work in x days, A will complete the same in $\frac{2x}{3}$ days.

$$\therefore \quad \frac{1}{x} + \frac{3}{2x} = \frac{1}{10}$$

$$\Rightarrow \quad \frac{2+3}{2x} = \frac{1}{10}$$

$$\Rightarrow \quad 2x = 50$$

$$\Rightarrow \quad x = 25 \text{ days}$$

Hence, the correct option is (b).

18. A does half as much work as B in three-fourth of the time. If together they take 18 days to complete a work, how much time shall B take to do it alone?

(SSC CGL Tier-I Exam 2011)

(a) 30 days (b) 35 days
(c) 40 days (d) 45 days

Explanation: Let B completes the work in x days.

$\therefore$ Work done by A in $\frac{3x}{4}$ days $= \frac{1}{2}$

$\Rightarrow$ Time taken by A in completing the work $= 2 \times 2 \times \frac{3x}{4} = \frac{3x}{2}$ days

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{x} + \frac{2}{3x} = \frac{3+2}{3x} = \frac{5}{3x}$$

$$\Rightarrow \quad \frac{5}{3x} = \frac{1}{18} \Rightarrow 3x = 90$$

$$\Rightarrow \quad x = 30$$

Hence, time taken by B in completing the work = 30 days.

Hence, the correct option is (a).

19. A and B can do a piece of work in 72 days. B and C can do it in 120 days, and A and C can do it in 90 days. When A, B and C work together, how much work is finished by them in 3 days.

(SSC Multi-Tasking (Non-Technical) Staff Exam. 2011)

(a) $\frac{1}{40}$ (b) $\frac{1}{30}$
(c) $\frac{1}{20}$ (d) $\frac{1}{20}$

Explanation: $(A + B)$'s 1 day work $= \frac{1}{72}$

$(B + C)$'s 1 day work $= \frac{1}{120}$

$(C + A)$'s 1 day work $= \frac{1}{90}$

On adding all three,

$$2(A + B + C)\text{'s 1 day work} = \frac{1}{72} + \frac{1}{120} + \frac{1}{90} = \frac{5+3+4}{360} = \frac{1}{30}$$

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

$\therefore$ $(A + B + C)$'s 3 days' work $= = \frac{3}{60} = \frac{1}{20}$

Hence, the correct option is (c).

20. P can complete $\frac{1}{4}$ of a work in 10 days, Q can complete 40% of the same work in 15 days, R completes $\frac{1}{3}$ of the work in 13 days and S completes $\frac{1}{6}$ of the work in 7 days. Who will be able to complete the work first?

(SSC CHSL DEO & LDC Exam. 2010)

(a) P (b) Q
(c) R (d) S

Explanation: Time taken by P in completing 1 work $= 10 \times 4 = 40$ days

Time taken by Q in completing 1 work $= \frac{15 \times 5}{2} = \frac{75}{2}$ days

Time taken by R in completing 1 work $= 13 \times 13 = 39$ days

Time taken by S in completing 1 work $= 7 \times 6 = 42$ days

Clearly, Q took the least time, i.e., $\frac{72}{2}$ or $37\frac{1}{2}$ days.

Hence, the correct option is (b).

21. A can complete $\frac{2}{3}$ of a work in 4 days and B can complete $\frac{3}{5}$ of the work in 6 days. In how many days can both A and B together complete the work?

[(SSC CISF ASI Exam 2010 (Paper-1)]

(a) 3 (b) 2
(c) $3\frac{3}{4}$ (d) $2\frac{7}{8}$

Explanation: Time taken by A to complete the work $= \frac{4 \times 3}{2} = 6$ days

Time taken by B to complete the work $= \frac{6 \times 5}{3} = 10$ days

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{6} + \frac{1}{10} = \frac{5+3}{30} = \frac{8}{30} = \frac{4}{15}$$

$\therefore$ A and B together will complete the work in $\frac{15}{4} = 3\frac{3}{4}$ days.

Hence, the correct option is (c).

22. A can complete $\frac{1}{3}$ of a work in 5 days and B, $\frac{2}{5}$ of the work in 10 days. In how many days both A and B together can complete the work?

(SSC CGL Tier-I Exam. 2010)

(a) 10 days (b) $9\frac{3}{8}$ days
(c) $8\frac{4}{5}$ days (d) $7\frac{1}{2}$ days

Explanation: Time taken by A alone in doing the work =15 days

Time taken by B alone in doing the work $= \frac{10 \times 5}{2} = 25$ days

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{15} + \frac{1}{25} = \frac{5+3}{75} = \frac{8}{75}$$

$\therefore$ Hence, the work will be completed in $\frac{75}{8} = 9\frac{3}{8}$ days.

Hence, the correct option is (b).

23. If 28 men complete $\frac{7}{8}$ of a piece of work in a week, then the number of men, who must be engaged to get the remaining work completed in another week, is

(SSC CGL Prelim Exam. 2008)

(a) 5 (b) 6
(c) 4 (d) 3

Explanation:

Work	Days	Men
$\frac{7}{8}$ ↓	7 ↓	28 ↓
$\frac{1}{8}$	7	x

$\therefore$ $\frac{7}{8} : \frac{1}{8} :: 28 : x$

Here, x denotes the number of men.

$$\Rightarrow \quad \frac{7}{8} \times x = \frac{1}{8} \times 28$$

$$\Rightarrow \quad x = \frac{28 \times 8}{7 \times 8} = 4$$

Hence, the correct option is (c).

24. A contractor undertook to complete a project in 90 days and employed 60 men on it. After 60 days, he found that $\frac{3}{4}$ of the work has already been completed. How many men can he discharge so that the project may be completed exactly on time?

(SSC CGL Prelim Exam. 2007)

(a) 40 (b) 20
(c) 30 (d) 15

Explanation:

Days	Work	Men
60 ↓	$\frac{3}{4}$ ↓	60 ↓
30	$\frac{1}{4}$	x

$\therefore$ $\left.\begin{matrix} 30 : 60 \\ \frac{3}{4} : \frac{1}{4} \end{matrix}\right\} :: 60 : x$

$$\Rightarrow \quad 30\times\frac{3}{4}\times x = 60\times\frac{1}{4}\times 60$$

$$\Rightarrow \quad x = \frac{60\times 60}{30\times 3} = 40$$

$\therefore$ 20 men should be discharged.
Hence, the correct option is (b).

25. A does $\frac{7}{10}$ part of work in 15 days. After that he completes the remaining work in 4 days with the help of B. In how many days will A and B together do the same work?

(SSC CGL Prelim Exam. 2002 & 2005)

(a) $10\frac{1}{3}$ days (b) $12\frac{2}{3}$ days

(c) $13\frac{1}{3}$ days (d) $8\frac{1}{4}$ days

Explanation: Remaining work

$$= 1-\frac{7}{10} = \frac{3}{10}$$

$\because$ $(A + B)$ take 4 days to do $\frac{3}{10}$ work.

$\therefore$ $(A + B)$ will do the work in $4\times\frac{10}{3}$ days

$$= \frac{40}{3} = 13\frac{1}{3}\text{days}$$

Hence, the correct option is (c).

26. A can do $\frac{1}{2}$ of a piece of work in 5 days, B can do $\frac{3}{5}$ of the same work in 9 days and C can do $\frac{2}{3}$ of that work in 8 days. In how many days can three of them together do the work?

(SSC CPO S.I, Exam. 2005)

(a) 3 days (b) 5 days

(c) $4\frac{1}{2}$ days (d) 4 days

Explanation: A can do $\frac{1}{2}$ work in 5 days.

$\therefore$ A can do 1 work in 10 days.
Similarly,

B can do 1 work in $\frac{5}{3}\times 9 = 15$ days.

C can do 1 work in $8\times\frac{3}{2} = 12$ days.

Now,

A's 1 day work $= \frac{1}{10}$

B's 1 day work $= \frac{1}{15}$

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

$\therefore$ $(A + B + C)$'s 1 day work

$$= \frac{1}{10}+\frac{1}{15}+\frac{1}{12}$$

$$= \frac{6+4+5}{60} = \frac{15}{60} = \frac{1}{4}$$

Hence, $(A + B + C)$ together can complete the work in 4 days.
Hence, the correct option is (d).

27. A can complete a work in 6 days while B can complete the same work in 12 days. If they work together and complete it, then the portion of the work done by A is

(SSC CPO S.I, Exam. 2003)

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$

(c) $\frac{1}{4}$ (d) $\frac{1}{2}$

Explanation: Time taken by A and B

$$= \frac{6\times 12}{6+12} = \frac{6\times 12}{18} = 4$$

$\therefore$ Work done by A in 4 days

$$= \frac{4}{6} = \frac{2}{3}$$

Hence, the correct option is (b).

28. A can finish a work in 18 days and B can do the same work in half the time taken by A. Then by working together what part of the same work they can finish in a day? **(SSC CGL Prelim Exam. 2002)**

(a) $\frac{1}{6}$ (b) $\frac{2}{5}$

(c) $\frac{1}{9}$ (d) $\frac{2}{7}$

Explanation: A's 1 day work $= \frac{1}{18}$

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

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{18}+\frac{1}{9} = \frac{1+2}{18} = \frac{3}{18} = \frac{1}{6}$$

Hence, the correct option is (a).

29. A does $\frac{4}{5}$ of a piece of work in 20 days. He then calls in B and they finish the remaining work in 3 days. How long B alone will take to do whole work?

(SSC CGL Prelim Exam. 2002)

(a) $37\frac{1}{2}$ days (b) 37 days

(c) 40 days (d) 23 days

Explanation: A can do the whole work in

$$\frac{20\times 5}{4} = 25 \text{ days}$$

Remaining work $= 1-\frac{4}{5} = \frac{1}{5}$

$\therefore$ $(A + B)$'s 1 day work $= \frac{1}{15}$

and A's 1 day work $= \frac{1}{25}$

$\therefore$ B's 1 day work

$$= \frac{1}{15}-\frac{1}{25} = \frac{5-3}{75} = \frac{2}{75}$$

$\therefore$ B can finish the work in $\frac{75}{2}$ days, i.e., $37\frac{1}{2}$ days.

Hence, the correct option is (a).

30. A can cultivate $\frac{2}{5}$ th of a land in 6 days and B can cultivate $\frac{1}{3}$ rd of the same land in 10 days. Working together A and B can 4 cultivate $\frac{4}{5}$ th of the land in

(SSC CGL Prelim Exam. 2002)

(a) 4 days
(b) 5 days
(c) 8 days
(d) 10 days

Explanation: The part of field cultivated by A in 1 day

$$= \frac{2}{5\times 6} = \frac{1}{15}$$

The part of field cultivated by B in 1 day

$$= \frac{1}{3\times 10} = \frac{1}{30}$$

$\therefore$ The part of field cultivated by A and B together

$$= \frac{1}{15}+\frac{1}{30} = \frac{3}{30} = \frac{1}{10}$$

$\therefore$ $\frac{4}{5}$ part of field cultivated by A and B together in

$$= \frac{\frac{4}{5}}{\frac{1}{10}}\text{days} = \frac{4\times 10}{5} = 8 \text{ days}$$

Hence, the correct option is (c).

31. A can do a work in 15 days and B can complete it in 20 days. If they together work on it for 4 days, then the fraction of the work that is left is

(SSC CGL Prelim Exam. 2000)

(a) $\frac{8}{15}$ (b) $\frac{7}{15}$

(c) $\frac{1}{4}$ (d) $\frac{1}{10}$

Explanation: A's work per day $= \frac{1}{15}$

B's work per day $= \frac{1}{20}$

$(A + B)$'s work per day

$$= \frac{1}{15} + \frac{1}{20} = \frac{4+3}{60} = \frac{7}{60}$$

$\therefore$ $(A+B)$'s work in 4 days

$$= 4 \times \frac{7}{60} = \frac{7}{15}$$

$$\text{Left work} = 1 - \frac{7}{15} = \frac{15-7}{15} = \frac{8}{15}$$

Hence, the correct option is (a).

Section V — Efficiency of Worker

1. If A, B and C can complete a work in 6 days. If A can work twice faster than B and thrice faster than C, then the number of days C alone can complete the work is

(SSC CGL Tier-I Exam, 2015)

(a) 33 days (b) 44 days

(c) 22 days (d) 11 days

Explanation: Let time taken by $A = x$ days

$\therefore$ Time taken by $B = 2x$ days

Time taken by $C = 3x$ days

According to the question,

$$\frac{1}{x} + \frac{1}{2x} + \frac{1}{3x} = \frac{1}{6}$$

$$\Rightarrow \quad \frac{6+3+2}{6x} = \frac{1}{6}$$

$$\Rightarrow \quad \frac{11}{6x} = \frac{1}{6}$$

$$\Rightarrow \quad 6x = 6 \times 11$$

$$\Rightarrow \quad x = \frac{6 \times 11}{6} = 11$$

$\therefore$ Time taken by C alone $= 3x$

$$= 3x \times 11 = 33 \text{ days}$$

Hence, the correct option is (a).

2. Pratibha is thrice as efficient as Sonia and is therefore able to finish a piece of work in 60 days less than Sonia. Pratibha and Sonia can individually complete the work respectively in

(SSC CGL Tier-I Exam. 2014)

(a) 30 days, 60 days

(b) 60 days, 90 days

(c) 30 days, 90 days

(d) 40 days, 120 days

Explanation: Time taken by Sonia $= 3x$ days (Assume)

$\therefore$ Time taken by Pratibha $= x$ days

$\therefore$ $3x - x = 60 \Rightarrow 2x = 60$

$\Rightarrow$ $x = 30$ days

$\therefore$ Time taken by Sonia $= 3x$ days $= 3 \times 30 = 90$ days.

Hence, the correct option is (c).

3. Sunil completes a work in 4 days, whereas Dinesh completes the work in 6 days. Ramesh works $1\frac{1}{2}$ times as fast as Sunil. The three together can complete the work in

(SSC GL Tier-II Exam. 2013

(a) $1\frac{5}{12}$ days (b) $1\frac{5}{7}$ days

(c) $1\frac{3}{8}$ days (d) $1\frac{5}{19}$ days

Explanation: Time taken by Ramesh

$$= 4 \times \frac{2}{3} = \frac{8}{3} \text{ days}$$

Work done by all three in 1 day

$$= \frac{1}{4} + \frac{1}{6} + \frac{3}{8} = \frac{6+4+9}{24} = \frac{19}{24}$$

$\therefore$ Required time

$$= \frac{24}{19} = 1\frac{5}{19} \text{ days}$$

Hence, the correct option is (d).

4. Two workers A and B working together completed a job in 5 days. If A worked twice as efficiently as he actually did and B worked $\frac{1}{3}$ as efficiently as he actually did, the work would have been completed in 3 days. To complete the job alone, A would require

(SSC GL Tier-II Exam. 2013)

(a) $5\frac{1}{5}$ days (b) $6\frac{1}{4}$ days

(c) $7\frac{1}{2}$ days (d) $8\frac{3}{4}$ days

Explanation: If A alone does the work in x days and B alone does the work in y days, then

$$\frac{1}{x} + \frac{1}{y} = \frac{1}{5} \qquad \text{(i)}$$

Again,

$$\frac{2}{x} + \frac{1}{3y} = \frac{1}{3} \qquad \text{(ii)}$$

By equation (ii) $\times 3 -$ (i),

$$\frac{6}{x} + \frac{1}{y} - \frac{1}{x} - \frac{1}{y} = 1 - \frac{1}{5}$$

$$\Rightarrow \quad \frac{6}{x} - \frac{1}{x} = \frac{4}{5}$$

$$\Rightarrow \quad \frac{6-1}{x} = \frac{4}{5}$$

$$\Rightarrow \quad x = \frac{25}{4} = 6\frac{1}{4} \text{ days}$$

Hence, the correct option is (b).

5. A can do a piece of work in 6 days. B is 25% more efficient than A. How long would B alone take to finish this work?

(SSC GL Tier-I Exam. 2013)

(a) $4\frac{4}{5}$ days (b) $3\frac{1}{3}$ days

(c) $5\frac{1}{4}$ days (d) $2\frac{2}{3}$ days

Explanation: Ratio of A's and B's efficiency $= 4 : 5$

Ratio of time taken $= 5 : 4$

$\therefore$ Time taken by $B = \frac{6 \times 4}{5}$

$$= \frac{24}{5} = 4\frac{4}{5} \text{ days}$$

Hence, the correct option is (a).

6. A does 20% less work than B. If A can complete a piece of work in $7\frac{1}{2}$ hours, then B alone can do it in

[(SSC CPO S.I. Exam. 2006) & (SSC GL Tier-I Exam. 2013)]

(a) $6\frac{1}{2}$ hours (b) 6 hours

(c) $5\frac{1}{2}$ hours (d) 5 hours

Explanation: A does 20% less work than B.

$\therefore$ Ratio of time taken = 5 : 4

A completes a work in $\frac{15}{2}$ hours.

$\therefore$ Time taken by B to do the same work

$$= \frac{15}{4} \times \frac{4}{5} = 6 \text{ hours.}$$

Hence, the correct option is (b).

7. A is thrice as good a workman as B and is, therefore, able to finish a piece of work in 60 days less than B. The time (in days) in which they can do it working together is

[(SSC CGL Prelim Exam. 1999 & (SSC CPO S.I. Exam. 2005) & (SSC CGL Tier-I Exam. 2011 & (SSC CHSL DEO & LDC Exam. 2012)]

(a) 22 days (b) $22\frac{1}{2}$ days

(c) 23 days (d) $23\frac{1}{4}$ days

Explanation: If A completes the work in x days, B will do the same in $3x$ days.

$$\therefore \quad 3x - x = 60$$

$$\Rightarrow \quad 2x = 60$$

$$\Rightarrow \quad x = 30 \text{ and } 3x = 90$$

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{30} + \frac{1}{90} = \frac{3+1}{90}$$

$$= \frac{4}{90} = \frac{2}{45}$$

A and B together will do the work in $\frac{45}{2}$ or $22\frac{1}{2}$ days.

Hence, the correct option is (b).

8. P is thrice as good a workman as Q and therefore able to finish a job in 48 days less than Q. Working together, they can do it in **(SSC CHSL DEO & LDC Exam. 2012)**

(a) 18 days (b) 24 days

(c) 30 days (d) 12 days

Explanation: Let the time taken by P = x days Then, time taken by $Q = 3x$ days

$$\therefore \quad 3x - x = 48 \Rightarrow x = 24$$

$\therefore$ $(P + Q)$'s 1 day work

$$= \frac{1}{24} + \frac{1}{72} = \frac{3+1}{72} = \frac{1}{8}$$

$\therefore$ Required time = 18 days

Hence, the correct option is (a).

9. A can do a certain work in 12 days. B is 60% more efficient than A. How many days will B and A together take to do the same job? **(SSC GL Tier-II Exam. 2012)**

(a) $\frac{80}{13}$ days (b) $\frac{70}{13}$ days

(c) $\frac{75}{13}$ days (d) $\frac{60}{13}$ days

Explanation: Time taken by B in completing the work

$$= 12 \times \frac{100}{160} = \frac{15}{2} \text{days}$$

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{12} + \frac{2}{15} = \frac{5+8}{60} = \frac{13}{60}$$

Hence, the work will be completed in $\frac{60}{13}$ days.

Hence, the correct option is (d).

10. To do a certain work, B would take time thrice 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. The time taken by A to complete the work separately is

[SSC DP S.I. (SI) Exam. 2012]

(a) 22 days (b) 24 days

(c) 30 days (d) 20 days

Explanation: If B does the work in $3x$ days, $(A + C)$ will do the same work in x days.

If C does that work in $2y$ days, then $(A + B)$ will do it in y days.

$$\therefore \quad \frac{1}{x} + \frac{1}{3x} = \frac{1}{10}$$

$$\Rightarrow \quad \frac{4}{3x} = \frac{1}{10}$$

$$\Rightarrow \quad 3x = 40$$

$$\Rightarrow \quad x = \frac{40}{3}$$

Again,

$$\frac{1}{y} + \frac{1}{2y} = \frac{1}{10}$$

$$\Rightarrow \quad \frac{3}{2y} = \frac{1}{10} \Rightarrow y = 15$$

$\therefore$ $(A + B + C)$'s 1 day work $= \frac{1}{10}$

$$\Rightarrow \quad \frac{1}{A} + \frac{1}{40} + \frac{1}{30} = \frac{1}{10}$$

$$\Rightarrow \quad \frac{1}{A} + \frac{1}{10} + \frac{1}{40} = \frac{1}{30}$$

$$= \frac{12-3-4}{120} = \frac{5}{120} = \frac{1}{24}$$

$\therefore$ A alone will complete the work in 24 days.

Hence, the correct option is (b).

11. A can do a piece of work in 70 days and B is 40% more efficient than A. The number of days taken by B to do the same work is

[FCI Assistant Grade-II Exam. 2012 (Paper-I)]

(a) 40 days (b) 60 days

(c) 50 days (d) 45 days

Explanation: $A : B = D_2 : D_1$

$$\Rightarrow \quad 100 : 140 = D_2 : 70$$

$$\Rightarrow \quad 100 \times 70 = 140 \times D_2$$

$$\Rightarrow \quad D_2 = \frac{100 \times 70}{140} = 50 \text{ days}$$

Hence, the correct option is (c).

12. A can do a certain job in 12 days. B is 60% more efficient than A. To do the same job B alone would take

(SSC CHSL DEO & LDC Exam. 2011)

(a) $7\frac{1}{2}$ days (b) 8 days

(c) 10 days (d) 7 days

Explanation: Time taken by B

$$= 12 \times \frac{100}{160} = \frac{15}{2} = 7\frac{1}{2} \text{days}$$

Hence, the correct option is (a).

13. 5 men and 2 women working together can do four times as much work per hour as a man and a woman together. The work done by a man and a woman should be in the ratio:

(SSC CHSL DEO & LDC Exam. 2011)

(a) 1 : 2 (b) 2 : 1

(c) 1 : 3 (d) 4 : 1

Explanation: $5m + 2w = 4m + 4w$

$$\Rightarrow \quad m = 2w$$

$\therefore$ Required ratio = 2 : 1

Hence, the correct option is (b).

14. A is 30% more efficient than B, and can alone do a work in 23 days. The number of days, in which A and B, working together can finish the job is

(SSC CHSL DEO & LDC Exam. 2011)

(a) 11 days (b) 13 days
(c) 20 days (d) 21 days

Explanation: Time taken by B

$$= \frac{130}{100} \times 23 = \frac{299}{10} \text{days}$$

$(A + B)$'s 1 day work

$$= \frac{1}{23} + \frac{10}{299}$$

$$= \frac{13+10}{299} = \frac{23}{299} = \frac{1}{13}$$

$\therefore$ Time taken by $(A + B) = 13$ days
Hence, the correct option is (b).

15. A can do a work in 9 days, if B is 50% more efficient than A, then in how many days can B do the same work?

(SSC CHSL DEO & LDC Exam. 2011)

(a) 13.5 days
(b) 4.5 days
(c) 6 days
(d) 3 days

Explanation: Time taken by

$$B = 9 \times \frac{100}{150}$$

$$= 6 \text{ days}$$

Hence, the correct option is (c).

16. A takes 10 days less than the time taken by B to finish a piece of work. If both A and B can do it in 12 days, then the time taken by B alone to finish the work is

(SSC CHSL DEO & LDC Exam. 2011)

(a) 30 days (b) 27 days
(c) 20 days (d) 25 days

Explanation: Let time taken by B in completing the work = x days

$\therefore$ Time taken by $A = (x - 10)$ days

$$\therefore \quad \frac{1}{x} + \frac{1}{x-10} = \frac{1}{12}$$

$$\Rightarrow \quad \frac{x-10+x}{x(x-10)} = \frac{1}{12}$$

$$\Rightarrow \quad 24x - 120 = x^2 - 10x$$

$$\Rightarrow \quad x^2 - 34x + 120 = 0$$

$$\Rightarrow \quad x^2 - 30x - 4x + 120 = 0$$

$$\Rightarrow \quad x(x-30) - 4(x-30) = 0$$

$$\Rightarrow \quad (x-4)(x-30) = 0$$

$$\Rightarrow \quad x = 30 \text{ because } x \neq 4$$

Hence, the correct option is (a).

17. A can do a work in 5 days less than the time taken by B to do it. If both of them together take $11\frac{1}{9}$ days, then the time taken by 'B' alone to do the same work (in days) is

(SSC CHSL DEO & LDC Exam. 2011)

(a) 15 (b) 20
(c) 25 (d) 30

Explanation: If the time taken by B to complete the work be x days, then the time taken by $A = (x - 5)$ days

$$\therefore \quad \frac{1}{x} + \frac{1}{x-5} = \frac{9}{100}$$

$$\therefore \quad \frac{x-5+x}{x(x-5)} = \frac{9}{100}$$

$$\Rightarrow \quad 9x^2 - 45x = 200x - 500$$

$$\Rightarrow \quad 9x^2 - 245x + 500 = 0$$

$$\Rightarrow \quad 9x^2 - 225x - 20x + 500 = 0$$

$$\Rightarrow \quad 9x(x-25) - 20(x-25) = 0$$

$$\Rightarrow \quad (x-25)(9x-20) = 0$$

$$\Rightarrow \quad x = 25 \text{ because } x \neq \frac{20}{9}$$

Hence, the correct option is (c).

18. A can do a work in 21 days. B is 40% more efficient than A. The number of days required for B to finish the same work alone is

(SSC CHSL DEO & LDC Exam. 2011)

(a) 10 days (b) 12 days
(c) 15 days (d) 18 days

Explanation: Time taken by B

$$= \frac{21 \times 100}{140} = 15 \text{ days}$$

Hence, the correct option is (c).

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

[SSC Multi-Tasking (Non-Technical) Staff Exam. 2011) & (SSC CGL Tier-I Exam. 2011]

(a) 14 days (b) 13 days
(c) 20 days (d) 15 days

Explanation: Time taken by A to complete the work = x days

$\therefore$ Time taken by B to complete the work = $3x$ days
So, $3x - x = 2x = 40$

$$\Rightarrow \quad x = 20 \text{ and } 3x = 60$$

$\therefore$ $(A + B)$'s 1 day work

$$= \frac{1}{20} + \frac{1}{60} = \frac{3+1}{60}$$

$$= \frac{4}{60} = \frac{1}{15}$$

$\therefore$ A and B together will complete the work in 15 days.
Hence, the correct option is (d).

20. A and B together can do a work in 12 days. B and C together do it in 15 days. If A's efficiency is twice that of C, then the days required for B alone to finish the work is **(SSC CGL Tier-I Exam 2011)**

(a) 60 days (b) 30 days
(c) 20 days (d) 15 day

Explanation: $(A + B)$'s 1 day work

$$= \frac{1}{12} \quad \text{(i)}$$

$(B + C)$'s 1 day work

$$= \frac{1}{15} \quad \text{(ii)}$$

$\therefore$ Difference between A and C's 1 day work

$$= \frac{1}{12} - \frac{1}{15} = \frac{5-4}{60} = \frac{1}{60}$$

If A alone completes the work in x days, then C will do the same in $2x$ days.

$$\therefore \quad \frac{1}{x} - \frac{1}{2x} = \frac{1}{60}$$

$$\frac{2-1}{2x} = \frac{1}{60} \Rightarrow \frac{1}{2x} = \frac{1}{60}$$

$$\Rightarrow \quad x = 30$$

$\therefore$ B's 1 day work

$$= \frac{5-2}{60} = \frac{3}{60} = \frac{1}{20} \quad \text{[From equation (i)]}$$

$$= \frac{1}{12} - \frac{1}{30}$$

Hence, B alone will complete the work in 20 days.
Hence, the correct option is (c).

21. A is 50% as efficient as B. C does half of the work done by A and B together. If C alone does the work in 20 days, then A, B and C together can do the work in

(SSC CGL Tier-I Exam 2011)

(a) $5\frac{2}{3}$ days (b) $6\frac{2}{3}$ days
(c) 6 days (d) 7 days

Explanation: If B alone completes the work in x days, A will do the same in $2x$ days.

$\therefore$ $(A + B)$'s 1 day work

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

and C's 1 day work $= \frac{3}{4x}$

$$\therefore \quad \frac{3}{4x} = \frac{1}{20}$$

$$\Rightarrow \quad 4x = 3 \times 20$$

$$\Rightarrow \quad x = \frac{3 \times 20}{4} = 15$$

$\therefore$ $(A+B+C)$'s 1 day work

$$= \frac{1}{2x} + \frac{1}{x} + \frac{3}{4x} = \frac{1}{30} + \frac{1}{15} + \frac{1}{20}$$

$$= \frac{2+4+3}{60} = \frac{9}{60} = \frac{3}{20}$$

Hence, all three together will complete the work in $\frac{20}{3}$ or $6\frac{2}{3}$ days.

Hence, the correct option is (b).

22. A is twice as good as workman B and together they finish a piece of work in 14 days. The number of days taken by A alone to finish the work is

[(SSC Multi-Tasking (Non-Technical) Staff Exam. 2011)]

(a) 11 days (b) 21 days
(c) 28 days (d) 42 days

Explanation: If A completes the work in x days, then B will take $2x$ days.

$$\therefore \quad \frac{1}{x} + \frac{1}{2x} = \frac{1}{14}$$

$$\Rightarrow \quad \frac{2+1}{2x} = \frac{1}{14}$$

$$\Rightarrow \quad 2x = 42 \Rightarrow x = 21 \text{ days}$$

Hence, the correct option is (b).

9. Tapas works twice as fast as Mihir. If both of them together complete a work in 12 days, Tapas alone can complete it in

[SSC CPO S.I. Exam. 2010 (Paper-I)]

(a) 15 days (b) 18 days
(c) 20 days (d) 24 days

Explanation: If Tapas alone takes x days to complete the work, then

$$\frac{1}{x} + \frac{1}{2x} = \frac{1}{12}$$

$$\Rightarrow \quad \frac{2+1}{2x} = \frac{1}{12}$$

$$\Rightarrow \quad 2x = 36$$

$$\Rightarrow \quad x = 18 \text{ days}$$

Hence, the correct option is (b).

23. A and B together can complete a work in 15 days. A is 50% more efficient worker than B. How long will A take to complete the work alone?

[SSC SAS Exam 2010 (Paper-1)]

(a) 20 days (b) 21 days
(c) 21.4 days (d) 22.5 days

Explanation: Ratio of the work of A and B done in 1 day = 3 : 2

$\because$ B's work done $= x$ (Assume), then

A's work done $= = \frac{x+50}{100}x = \frac{3}{2}x$

So, $(A : B)$'s work done $= \frac{3}{2}x : x$ or 3 : 2.

$\because$ Work done by A and B together in 1 day $= \frac{1}{15}$

$\therefore$ A's 1 day work $= \frac{1}{15} \times \frac{3}{5} = \frac{1}{25}$

Hence, A alone will finish the work in 25 days.

None of the options is correct.

24. Jyothi can do $\frac{3}{4}$ of a job in 12 days. Mala is twice as efficient as Jyothi. In how many days will Mala finish the job?

(SSC CPO S.I. Exam. 2009)

(a) 6 days (b) 8 days
(c) 12 days (d) 16 days

Explanation: $\because$ Jyothi can do $\frac{3}{4}$ th of a job in 12 days.

$\therefore$ Jyothi can do 1 job in $\frac{12 \times 4}{3}$ =16 days

As Mala is twice as efficient as Jyothi,

$\therefore$ Mala will finish the job in 8 days.

Hence, the correct option is (b).

25. A is twice as good as workman B and B is twice as good as workman C. If A and B can together finish a piece of work in 4 days, then C can do it by himself in

(SSC CPO S.I. Exam. 2009)

(a) 6 days (b) 8 days
(c) 24 days (d) 12 days

Explanation: According to the question, if A takes x days to complete the work, then B will take $2x$ days and C will take $4x$ days.

Now, $(A + B)$'s 1 day work

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

$$\Rightarrow \quad \frac{1}{x} + \frac{1}{2x} = \frac{1}{4} \Rightarrow \frac{2+1}{2x} = \frac{1}{4}$$

$$\Rightarrow \quad 2x = 12 \Rightarrow x = 6$$

$\therefore$ C will complete the work in $4x$, i.e., 24 days.

Hence, the correct option is (c).

26. A 10 hectare field is reaped by 2 men, 3 women and 4 children together in 10 days. If working capabilities of a man, a woman and a child are in the ratio 5 : 4 : 2, then a 16 hectare field will be reaped by 6 men, 4 women and 7 children in

(SSC CPO S.I. Exam. 2008)

(a) 5 days (b) 6 days
(c) 7 days (d) 8 days

Explanation: Ratio of the working capabilities of a man, a woman and a child = 5 : 4 : 2

$\therefore$ Ratio of man, woman and child equivalence $= \frac{1}{5} : \frac{1}{4} : \frac{1}{2}$

$$= \frac{1}{5} \times 20 : \frac{1}{4} \times 20 : \frac{1}{2} \times 20$$

$$= 4 : 5 : 10$$

or 4 men $\equiv$ 5 women $\equiv$ 10 children

4 men = 10 children

$\therefore$ 2 men $\equiv$ 5 children and 6 men $\equiv$ 15 children

5 women = 10 children

$\therefore$ 3 women $\equiv$ 6 children

4 women $\equiv$ 8 children

$\therefore$ 2 men+ 3 women+ 4 children = 15 children

6 men + 4 women + 7 children = 30 children

$$\begin{matrix} 15 \uparrow & 10 \downarrow & 10 \downarrow \\ 30 \uparrow & 16 \downarrow & x \downarrow \end{matrix}$$

$$\Rightarrow \quad \left.\begin{matrix} 30:15 \\ 10:16 \end{matrix}\right\} :: 10 : x$$

where, x is the number of days

$$\Rightarrow \quad x = \frac{15 \times 16 \times 10}{30 \times 10} = 8 \text{ days}$$

Hence, the correct option is (d).

27. *A* takes twice as much time as *B* and thrice as much as *C* to complete a piece of work. They together complete the work in 1 day. In what time, will *A* alone complete the work? **(SSC DEO Exam. 2008)**

(a) 9 days (b) 5 days
(c) 6 days (d) 4 days

Explanation: Let the time taken by *C* to complete the work = *x* days

∴ Time taken by *A* to complete the work = $3x$ days and time taken by *B* to complete the work = $\frac{3x}{2}$ days

According to the question,

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

$$\Rightarrow \quad \frac{1}{3x}+\frac{2}{3x}+\frac{1}{x}=1$$

$$\Rightarrow \quad \frac{1+2+3}{3x}=1$$

$$\Rightarrow \quad \frac{6}{3x}=1 \Rightarrow \frac{2}{x}=1$$

$$\Rightarrow \quad x=2$$

∴ Time taken by *A*

$$= 3x = 3 \times 2 = 6 \text{ days}$$

Hence, the correct option is (c).

28. To complete a work, *A* takes 50% more time than *B*. If together they take 18 days to complete the work, how much time shall *B* take to do it?

(SSC CGL Prelim Exam. 2007)

(a) 30 days (b) 35 days
(c) 40 days (d) 45 days

Explanation: Let *B* alone can do the work in *x* days.

∴ *A* can do the work in $\frac{3x}{2}$ days.

According to the question,

$$\Rightarrow \quad \frac{1}{x}+\frac{2}{3x}=\frac{1}{18} \Rightarrow \frac{3+2}{3x}=\frac{1}{18}$$

$$\Rightarrow \quad x=\frac{18\times 5}{3}=30 \text{ days}$$

Hence, the correct option is (a).

29. *A* does half as much work as *B* in one sixth of the time. If together they take 10 days to complete a work, how much time shall *B* take to do it alone?

(SSC CGL Prelim Exam. 2002 & 2005)

(a) 70 days (b) 30 days
(c) 40 days (d) 50 days

Explanation: Let *B* does the whole work in *x* days.

∴ Work done by *B* in 1 day = $\frac{1}{x}$

According to the question,

A does the $\frac{1}{2}$ work in $\frac{x}{6}$ days.

∴ *A* does the whole work in $\frac{2x}{6}$ or $=\frac{x}{3}$ days.

∴ Work done by *A* in one day = $\frac{3}{x}$

∴ Work done by *A* and *B* together in one day

$$=\frac{1}{x}+\frac{3}{x}=\frac{4}{x}$$

∴ Time taken to complete the whole work by *A* and *B* together

$$=\frac{1}{\frac{4}{x}}=\frac{x}{4} \text{ days}$$

Again, given that

$$\frac{x}{4}=10$$

$$\therefore \quad x=40 \text{ days}$$

Hence, the correct option is (c).

30. Kamal can do a work in 15 days. Bimal is 50 per cent more efficient than Kamal in doing the work. In how many days will Bimal do that work?

[(SSC CGL Prelim Exam. 2002) & (SSC CPO S.I. Exam.2006)]

(a) 14 days (b) 12 days
(c) 10 days (d) $10\frac{1}{2}$ days

Explanation: Efficiency and time taken are inversely proportional, so Bimal: Kamal = 150 : 100 (work)

$$\Rightarrow \quad 100 : 150 \text{ (Time)} = 2 : 3$$

∵ 3 units ⇒ 15 days

$$\therefore \text{ 2 units} \Rightarrow \frac{15}{2} \times 2 = 10$$

Hence, Bimal complete the work in 10 days. Hence, the correct option is (c).

31. *A* does half as much work as *B* in one sixth of the time. If together they take 10 days to complete a work, how much time shall *B* take to do it alone?

(SSC CGL Prelim Exam. 2002 & 2005)

(a) 70 days (b) 30 days
(c) 40 days (d) 50 days

Explanation: Let *B* does the whole work in *x* days.

∴ Work done by *B* in 1 day = $\frac{1}{x}$

According to the question,

A does $\frac{1}{2}$ work in $\frac{x}{6}$ days.

∴ *A* does the whole work in $\frac{2x}{6}$ or $=\frac{x}{3}$ days.

∴ Work done by *A* in one day = $\frac{3}{x}$

∴ Work done by *A* and *B* together in one day

$$=\frac{1}{x}+\frac{3}{x}=\frac{4}{x}$$

∴ Time taken to complete the whole work by *A* and *B* together

$$=\frac{1}{\frac{4}{x}}=\frac{x}{4} \text{ days}$$

Again, given that

$$\frac{x}{4}=10$$

$$\therefore \quad x=40 \text{ days}$$

Hence, the correct option is (c).

32. Babu and Asha can do a job together in 7 days. Asha is $1\frac{3}{4}$ times as efficient as Babu. The same job can be done by Asha alone in

(SSC CGL Prelim Exam. 2003)

(a) $\frac{49}{4}$ days (b) $\frac{49}{3}$ days
(c) 11 days (d) $\frac{28}{3}$ days

Explanation: The ratio of efficiency of Babu and Asha = $1 : \frac{7}{4} = 4 : 7$

As the time taken is inversely proportional to efficiency, therefore, if Babu takes $7x$ days to complete the work, Asha will take $4x$ days.

$$\therefore \quad \frac{1}{7x}+\frac{1}{4x}=\frac{1}{7} \Rightarrow \frac{4+7}{28x}=\frac{1}{7}$$

$$\Rightarrow \quad 28x = 11 \times 7$$

∴ Asha will complete the work in $4x = 4 \times \frac{11}{4} = 11$ days.

Hence, the correct option is (c).

33. A and B can do a job together in 12 days. A is 2 times as efficient as B. In how many days can B alone complete the work?

[(SSC CHSL DEO & LDC Exam. 2012)& (SSC CGL Prelim Exam. 2000)]

(a) 18 days (b) 9 days
(c) 36 days (d) 12 days

Explanation: If A alone completes the work in x days, B will complete the same in $2x$ days.

$$\therefore \quad \frac{1}{x}+\frac{1}{2x}=\frac{1}{12}$$

$$\Rightarrow \quad \frac{2+1}{2x}=\frac{1}{12}$$

$$\Rightarrow \quad 2x=36$$

$\therefore$ B alone will complete the work in 36 days (i.e., $2x$).

Hence, the correct option is (c).

Section VI — Based on Formula $M_1D_1W_1 = M_2D_2W_2$ and its Interchange

1. Machine A can print 100000 pages in 8 h and machine B can print 100000 pages in 20 h. Both machines started working at 9 AM. The machine B is rested for 12 min after every 2 h. Approximately at what time will the printing of 1 lakh pages be completed?

[SSC SI & Assistant SI (CISF) Prelim Exam. 2016]

(a) 1 : 30 (b) 2 : 00
(c) 2 : 50 (d) 3 : 51

Explanation: In 1 h machine A can print

$$= \frac{100000}{8} = 12500 \text{ pages}$$

In 1 h machine B can print

$$= \frac{100000}{20} = 5000 \text{ pages}$$

We know that machine B rests for 12 min after every 2 h.

Therefore, machine B can print x number of pages $(60 - 12) = 48$ min in the hour when it rests.

In 48 min,

$$x = \frac{100000}{20\times 60}\times 48$$

$$\Rightarrow \quad x = 4000 \text{ pages}$$

Now, for first 2 h, total number of pages print by machine A and B are

$$2(12500 + 5000) = 25000 + 10000$$
$$= 35000 \text{ pages}$$

In the next 2 h,

$A \quad B \quad A \quad B$

Number of pages

$= (12500 + 4000 + 12500 + 5000)$

$= 34000$ pages

Again in the next 2 h,

Number of pages = 34000 pages

After 6 h, total number of pages = 35000 + 34000 + 34000 = 103000 pages.

$\therefore$ At 2 : 50 pm approximately 100000 pages will print.

Hence, the correct option is (c).

2. If 4 men or 8 women can do a piece of work in 15 days, in how many days can 6 men and 12 women do the same piece of work? (SSC CGL Tier-I Exam. 2015)

(a) 20 days (b) 45 days
(c) 15 days (d) 30 days

Explanation: According to the question,

$$4 \text{ men} = 8 \text{ women}$$

$$\Rightarrow \quad 1 \text{ man} = 2 \text{ women}$$

$\therefore$ 6 men +12 women = 12 women + 12 women = 24 women

$$\therefore \quad M_1D_1 = M_2D_2$$

$$\Rightarrow \quad 8\times 15 = 24\times D_2$$

$$\Rightarrow \quad D_2 = \frac{8\times 15}{24} = 5 \text{ days}$$

None of the options is correct.

3. If 7 men working 7 hours a day for each of 7 days produce 7 units of work, then the units of work produced by 5 men working 5 hours a day for each of 5 days is

(SSC CHSL DEO Exam. 2014)

(a) $\frac{25}{345}$ (b) $\frac{125}{49}$
(c) $\frac{49}{125}$ (d) $\frac{343}{25}$

Explanation: $\frac{M_1D_1T_1}{W_1} = \frac{M_2D_2T_2}{W_2}$

$$\Rightarrow \quad \frac{7\times 7\times 7}{7} = \frac{5\times 5\times 5}{W_2}$$

$$\Rightarrow \quad 49\times W_2 = 125$$

$$\Rightarrow \quad W_2 = \frac{125}{49}$$

Hence, the correct option is (b).

4. A group of 75 men are employed to lay down a railway line in 3 months. Due to certain emergency conditions, the work was to be finished in 18 days. How many more men should be employed to complete the work in the desired time?

(SSC CAPFs SI, CISF ASI & DP SI Exam. 2014)

(a) 300 (b) 325
(c) 350 (d) 375

Explanation: $M_1D_1 = M_2D_2$

$$\Rightarrow \quad 75\times 90 = M_2\times 18$$

$$\Rightarrow \quad M_2 = \frac{75\times 90}{18} = 375$$

$\therefore$ Number of additional men = 375 − 75 = 300

Hence, the correct option is (a).

5. If x men can do a piece of work in x days, then the number of days in which y men can do the same work is

(SSC GL Tier-II Exam. 2013

(a) xy days (b) $\frac{y^2}{x}$ days
(c) $\frac{x^2}{y}$ days (d) x^2y days

Explanation: $M_1D_1 = M_2D_2$

$$\Rightarrow \quad x\cdot x = y\cdot D_2$$

$$\Rightarrow \quad D_2 = \frac{x^2}{y}\text{days}$$

Hence, the correct option is (c).

6. 3 men and 7 women can do a job in 5 days, while 4 men and 6 women can do it in 4 days. The number of days required for a group of 10 women working together, at the same rate as before, to finish the same job is

(SSC CAPFs SI & CISF ASI Exam. 2013)

(a) 30 days (b) 36 days
(c) 40 days (d) 20 days

Explanation: 3×5 men + 7×5 women = 4×4 men + 6×4 women

$\Rightarrow$ 16 men − 15 men = 35 women − 24 women

$\therefore$ 1 man = 11 women

$\therefore$ 3 men + 7 women = 40 women

$\therefore \quad M_1D_1 = M_2D_2$

$\Rightarrow \quad 40 \times 5 = 10 \times D_2$

$\Rightarrow \quad D_2 = 20$ days

Hence, the correct option is (d).

7. One man, 3 women and 4 boys can do a piece of work in 96 hours, 2 men and 8 boys can do it in 80 hours, 2 men and 3 women can do it in 120 hours. 5 men and 12 boys can do it in **(SSC GL Tier-I Exam. 2013)**

(a) $39\frac{1}{11}$ hours (b) $42\frac{7}{11}$ hours

(c) $43\frac{7}{11}$ hours (d) 44 hours

Explanation: 1 hour's work of 1 man and 4 boys = $\frac{1}{160}$

[$\therefore$ 2 men and 8 boys can do the work in 80 hours]

1 hour's work of 1 man, 3 women and 4 boys = $\frac{1}{96}$

1 hour's work of 3 women

$$= \frac{1}{96} - \frac{1}{160} = \frac{10-6}{960} = \frac{1}{240}$$

1 hour's work of 2 men = $\frac{1}{120} - \frac{1}{140} = \frac{1}{240}$

1 hour's work of 4 boys

$$= \frac{1}{160} - \frac{1}{480} = \frac{3-1}{480} = \frac{1}{240}$$

$\therefore$ 2 men = 3 women = 4 boys

$\therefore$ 2 men + 8 boys = 12 boys

5 men + 12 boys = 22 boys

$\therefore$ By $M_1D_1 = M_2D_2$

$\Rightarrow \quad 12 \times 80 = 22 \times D_2$

$\Rightarrow D_2 = \frac{12 \times 80}{22} = \frac{480}{11} = 43 = \frac{7}{11}$ hours

Hence, the correct option is (c).

8. A contractor undertook to finish a certain work in 124 days and employed 120 men. After 64 days, he found that he had already done $\frac{2}{3}$ of the work. How many men can be discharged now so that the work may finish in time? **(SSC GL Tier-I Exam. 2013)**

(a) 48 (b) 56

(c) 40 (d) 50

Explanation: Remaining work

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

Remaining days = 124 − 64 = 60

$\therefore \quad \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$

$\Rightarrow \quad \frac{120 \times 64}{\frac{2}{3}} = \frac{M_2 \times 60}{\frac{1}{3}}$

$\Rightarrow \quad M_2 = \frac{120 \times 64}{2 \times 60} = 64$

$\therefore$ Number of men can be discharged = 120 − 64 = 56 men

Hence, the correct option is (b).

9. A man undertakes to do a certain work in 150 days. He employs 200 men. He finds that only a quarter of the work is done in 50 days. The number of additional men that should be appointed so that the whole work will be finished in time is **(SSC GL Tier-I Exam. 2013)**

(a) 75 (b) 100

(c) 125 (d) 50

Explanation: 200 men do $\frac{1}{4}$ work in 50 days.

$\therefore \quad \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$

$\Rightarrow \quad \frac{200 \times 50}{\frac{1}{4}} = \frac{M_2 \times 100}{\frac{3}{4}}$

$\Rightarrow \quad M_2 \times 100 = 200 \times 50 \times 3$

$\Rightarrow \quad M_2 = 300$

$\therefore$ Additional men = 100

Hence, the correct option is (b).

10. A contractor undertook to finish a work in 92 days and employed 110 men. After 48 days, he found that he had already done $\frac{3}{5}$ part of the work, the number of men he can withdraw so that the work may still be finished in time is **(SSC Multi-Tasking Staff Exam. 2013)**

(a) 45 (b) 40

(c) 35 (d) 30

Explanation: $\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$

$\Rightarrow \quad \frac{110 \times 48}{\frac{3}{5}} = \frac{M_2 \times 44}{\frac{2}{5}}$

$\Rightarrow \quad M_2 \times 44 \times 3 = 110 \times 48 \times 2$

$\Rightarrow \quad M_2 = \frac{110 \times 48 \times 2}{44 \times 3} = 80$

$\therefore$ Number of men can be withdrawn = 110 − 80 = 30

Hence, the correct option is (d).

11. 18 boys can do a piece of work in 24 days. In how many days can 27 boys do the same work? **(SSC CHSL DEO & LDC Exam. 2012)**

(a) 16 days (b) 32 days

(c) 23 days (d) 48 days

Explanation: $M_1D_1 = M_2D_2$

$\Rightarrow \quad 18 \times 24 = 27 \times D_2$

$\Rightarrow \quad D_2 = \frac{18 \times 24}{27} = 16$ days

Hence, the correct option is (c).

12. 30 men can repair a road in 18 days. They are joined by 6 more workers. Now the road can be repaired in **(SSC CHSL DEO & LDC Exam. 2012)**

(a) 14 days (b) 15 days

(c) 16 days (d) 17 days

Explanation: $M_1D_1 = M_2D_2$

$\Rightarrow \quad 30 \times 18 = 36 \times D_2$

$\Rightarrow \quad D_2 = \frac{30 \times 18}{36} = 15$ days

Hence, the correct option is (b).

13. If 80 persons can finish a work within 16 days by working 6 hours a day, the number of hours a day, should 64 persons work to finish that very job within 15 days is **(SSC CHSL DEO & LDC Exam. 2012)**

(a) 5 hours (b) 7 hours

(c) 8 hours (d) 6 hours

Explanation: $M_1D_1T_1 = M_2D_2T_2$

$\Rightarrow \quad 80 \times 16 \times 6 = 64 \times 15 \times T_2$

$\Rightarrow \quad T_2 = \frac{80 \times 16 \times 6}{64 \times 5} = 8$ hours

Hence, the correct option is (c).

14. Some persons can do a piece of work in 12 days. Two times the number of such persons will do half of the work in **[SSC Constable (GD) & Rifleman (GD) Exam. 2012]**

(a) 9 days (b) 6 days
(c) 5 days (d) 3 days

Explanation: $\frac{M_1D_1}{W_1}=\frac{M_2D_2}{W_2}$

$\Rightarrow \quad \frac{M\times 12}{W}=\frac{2M\times D_2}{\frac{W}{2}}$

$\Rightarrow \quad \frac{M\times 12}{W}=\frac{4MD_2}{W}$

$\Rightarrow \quad D_2=3$ days

Hence, the correct option is (d).

15. Some carpenters promised to do a job in 9 days but 5 of them were absent and remaining men did the job in 12 days. The original number of carpenters was
[FCI Assistant Grade-II Exam. 2012 (Paper I)]

(a) 24 (b) 20
(c) 16 (d) 18

Explanation: Let the original number of carpenters be x.

$M_1D_1=M_2D_2$

$\Rightarrow \quad x\times 9=(x-5)\times 12$

$\Rightarrow \quad 9x=12x-60$

$\Rightarrow \quad 3x=60$

$\Rightarrow \quad x=20$

Hence, the correct option is (b).

16. If the work done by $(x-1)$ men in $(x+1)$ days is to the work done by $(x+2)$ men in $(x-1)$ days are in the ratio 9 : 10, then the value of x is equal to
(SSC CHSL DEO & LDC Exam. 2011)

(a) 5 (b) 6
(c) 7 (d) 8

Explanation: $\frac{M_1D_1}{W_1}=\frac{M_2D_2}{W_2}$

$\therefore \quad \frac{W_1}{W_2}=\frac{M_1D_1}{M_2D_2}$

$\therefore \quad \frac{9}{10}=\frac{(x-1)(x+1)}{(x+2)(x-1)}=\frac{x+1}{x+2}$

$\Rightarrow \quad 10x+10-9x+18$

$\Rightarrow \quad x=18-10=8$

Hence, the correct option is (d).

17. Either 8 men or 17 women can paint a house in 33 days. The number of days required to paint three such houses by 12 men and 24 women working at the same rate is **(SSC CHSL DEO & LDC Exam. 2011)**

(a) 44 days (b) 43 days
(c) 34 days (d) 66 days

Explanation: 8 men = 17 women

$\Rightarrow \quad 12 \text{ men} \equiv \frac{17}{8}\times 12=\frac{5}{12}\text{women}$

$\therefore$ 12 men + 24 women

$=\frac{51}{2}+24=\frac{99}{2}\text{women}$

By $\frac{M_1D_1}{W_1}=\frac{M_2D_2}{W_2}$

$\frac{17\times 33}{1}=\frac{99\times D_2}{2\times 3}$

$\Rightarrow \quad D_2=\frac{17\times 33\times 6}{99}=34$ days

Hence, the correct option is (c).

18. Suppose that 'x' number of men can finish a piece of work in 30 days. If there were 6 men more, the work could be finished in 10 days less. The original number of men is **(SSC CGL Tier-I Exam. 2011)**

(a) 6 (b) 10
(c) 12 (d) 15

Explanation:

Men	Days
x ↑	10 ↓
$x+6$ ↑	20 ↓

$x+6 : x :: 30 : 20$

$\Rightarrow \quad \frac{x+6}{x}=\frac{30}{20}=\frac{3}{2}$

$\Rightarrow \quad 2x+12=3x$

$\Rightarrow \quad 3x-2x=12$

$\Rightarrow \quad x=2$

Hence, the correct option is (c).

19. Working 8 hours a day, Ann can copy a book in 18 days. How many hours a day should she work so as to finish the work in 12 days? **[SSC CISF Constable (GD) Exam.2011]**

(a) 12 hours (b) 10 hours
(c) 11 hours (d) 13 hours

Explanation:

Days	Working hours/day
18 ↑	8 ↓
12 ↑	x ↓

$\Rightarrow \quad \frac{12}{18}=\frac{8}{x}$

Where x is hours/days

$\Rightarrow \quad 12x=18\times 8$

$\Rightarrow \quad x=\frac{18\times 8}{12}=12$ hours

Hence, the correct option is (a).

20. 2 men and 3 women together or 4 men together can complete a piece of work in 20 days. 3 men and 3 women will complete the same work in
(SSC CHSL DEO & LDC Exam. 2010)

(a) 12 days (b) 16 days
(c) 18 days (d) 19 days

Explanation: 2 men + 3 women ≡ 4 men

$\Rightarrow \quad 2 \text{ men} \equiv \text{women}$

$\therefore$ 3 men + 3 women ≡ 5 men

$\therefore \quad M_1D_1=M_2D_2$

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

$\Rightarrow \quad D_2=\frac{4\times 20}{5}=16$ days

Hence, the correct option is (b).

21. 20 men or 24 women can complete a piece of work in 20 days. If 30 men and 12 women undertake to complete the work, the work will be completed in
(SSC Investigator Exam. 2010)

(a) 10 days (b) 12 days
(c) 15 days (d) 16 days

Explanation: 20 men ≡ 24 women

$\Rightarrow \quad 5 \text{ men} \equiv 6 \text{ women}$

$\therefore$ 30 men + 12 women

$=40$ men

$\therefore \quad M_1D_1=M_2D_2$

$\Rightarrow \quad 20\times 20=40\times D_2$

$\Rightarrow \quad D_2=\frac{20\times 20}{40}=10$ days

Hence, the correct option is (a).

22. 7 men can complete a piece of work in 12 days. How many additional men will be required to complete double the work in 8 days? **(SSC CGL Tier-I Exam. 2010)**

(a) 28 (b) 21
(c) 14 (d) 7

Explanation:

Work	Length	Men
1 ↓	12 ↑	7 ↓
2 ↓	8 ↑	x ↓

$\therefore \quad \left.\begin{matrix}1 & : & 2\\ 8 & : & 12\end{matrix}\right\} ::7:x$

Where, x is the number of men.

$\Rightarrow \quad 1\times 8\times x=2\times 12\times 7$

$\Rightarrow \quad x=\frac{2\times 12\times 7}{8}=21$

$\Rightarrow$ Number of additional men

$=21-7=14$

Method 2:

$$M_1D_1W_2 = M_2D_2W_1$$

$$\Rightarrow \quad 7 \times 12 \times 2 = M_2 \times 8 \times 1$$

$$\Rightarrow \quad M_2 = \frac{7 \times 12 \times 2}{8} = 21$$

$\therefore$ Number of additional men= $21 - 7 = 14$

Hence, the correct option is (c).

23. If 10 men can do a piece of work in 12 days, the time taken by 12 men to do the same piece of work will be

(SSC CPO S.I. Exam. 2008)

(a) 12 days (b) 10 days

(c) 9 days (d) 8 days

Explanation:

Men	Days
10 ↑	12 ↓
12	x

Where x = number of days

$$\Rightarrow \quad 12 : 10 :: 12 : x$$

$$\Rightarrow \quad 12 \times x = 10 \times 12$$

$$\Rightarrow \quad x = \frac{10 \times 12}{12} = 10 \text{ days}$$

Hence, the correct option is (b).

24. If p men working p hours per day for p days produce p units of work then the units of work produced by n men working n hours a day for n days is

(SSC CGL Prelim Exam. 2008)

(a) $\frac{p^2}{n^2}$ (b) $\frac{p^3}{n^2}$

(c) $\frac{n^2}{p^2}$ (d) $\frac{n^3}{p^2}$

Explanation: $\therefore$ P men working P hours/day for P days produce P units of work.

$\therefore$ 1 man working 1 hour/day for 1 day produce

$$\frac{P}{P^3} = \frac{1}{P^2} \text{ units of work}$$

$\therefore$ n men working n hours a day for n days produce $\frac{n^3}{P^2}$ units of work.

Hence, the correct option is (d).

25. Two persons can complete a piece of work in 9 days. How many more persons are needed to complete double the work in 12 days?

(SSC CPO S.I. Exam. 2006)

(a) 3 (b) 2

(c) 4 (d) 1

Explanation:

Work	Days	Persons
1 ↓	8 ↑	2 ↓
2	12	x

Where x = number of persons

$$\left.\begin{matrix} 1 & : & 2 \\ 12 & : & 9 \end{matrix}\right\} :: 2 : x$$

$$\Rightarrow \quad 1 \times 12 \times x = 2 \times 9 \times 2$$

$$\Rightarrow \quad x = \frac{2 \times 9 \times 2}{12} = 3$$

Hence, the correct option is (a).

26. A group of 4 mat-weavers can weave 4 mats in 4 days. At the same rate how many mats would be woven by 8 mat-weavers in 8 days?

(SSC CGL Prelim Exam. 2004)

(a) 4 (b) 8

(c) 12 (d) 16

Explanation:

Weaver	Days	Mats
4 ↑	4 ↓	4 ↓
8	8	x

$$\left.\begin{matrix} 4 & : & 8 \\ 4 & : & 8 \end{matrix}\right\} :: 4 : x$$

Where, x is the number of mats.

$$\Rightarrow \quad 4 \times 4 \times x = 8 \times 8 \times 4$$

$$\therefore \quad x = \frac{8 \times 8 \times 4}{4 \times 4} = 16$$

Hence, the correct option is (d).

27. 5 persons can prepare an admission list in 8 days working 7 hours a day. If 2 persons join them so as to complete the work in 4 days, they need to work per day for

(SSC CGL Prelim Exam. 2004)

(a) 10 hours (b) 9 hours

(c) 12 hours (d) 8 hours

Explanation: More persons, less working hours/day.

Less days, more working hours/day.

$$\left.\begin{matrix} \text{Persons} & 7 & : & 5 \\ \text{Days} & 4 & : & 8 \end{matrix}\right\} :: 7 : x$$

Where, x is hours/days.

$$\therefore \quad 7 \times 4 \times x = 5 \times 8 \times 7$$

$$\therefore \quad x = \frac{5 \times 8 \times 7}{7 \times 4} = 10 \text{ hours}$$

Hence, the correct option is (a).

28. 10 men working 6 hours a day can complete a work in 18 days. How many hours a day must 15 men work to complete the same work in 12 days?

(SSC CGL Prelim Exam. 2004)

(a) 6 days (b) 10 days

(c) 12 days (d) 15 days

Explanation:

Men	Days	Working hours
10 ↑	18 ↑	6 ↓
15	12	x

Where, x is working hrs/days.

$$\therefore \quad \left.\begin{matrix} 15 & : & 10 \\ 12 & : & 18 \end{matrix}\right\} :: 6 : x$$

$$\Rightarrow \quad 15 \times 12 \times x = 10 \times 18 \times 6$$

$$\Rightarrow \quad x = \frac{10 \times 18 \times 6}{15 \times 12} = 6 \text{ hours}$$

Hence, the correct option is (a).

29. If 72 men can build a wall of 280 m length in 21 days, then how many men could take 18 days to build a similar type of wall of length 100 m?

(SSC CGL Prelim Exam. 2003)

(a) 30 (b) 10

(c) 18 (d) 28

Explanation: We know that,

$$\frac{W_1}{M_1D_1} = \frac{W_2}{M_2D_2}$$

$$\Rightarrow \quad \frac{280}{72 \times 21} = \frac{100}{x \times 18}$$

(where x = number of men)

$$\Rightarrow \quad x \times 18 \times 280 = 100 \times 72 \times 21$$

$$\Rightarrow \quad x = \frac{100 \times 72 \times 21}{18 \times 280} = 30$$

Hence, the correct option is (a).

30. A wall of 100 metres can be built by 7 men or 10 women in 10 days. How many days will 14 men and 20 women take to build a wall of 600 metres?

(SSC CGL Prelim Exam. 2003)

(a) 15 (b) 20

(c) 25 (d) 30

Explanation: 7 men or 10 women

or $\quad 1 \text{ man} = \frac{10}{7} \text{ women}$

14 men + 20 women

$$= \left(\frac{10 \times 14}{7} + 20\right) \text{women} = 40 \text{ women}$$

Now, more work, more days, more women, less days

$$\left.\begin{matrix} \text{Work} & 1 & : & 6 \\ \text{Women} & 40 & : & 10 \end{matrix}\right\} :: 10 : x$$

Where x = number of days

$$\Rightarrow \quad 1 \times 40 \times x = 6 \times 10 \times 10$$

or $x = \frac{600}{40} = 15$

Hence, the correct option is (a).

31. 39 persons can repair a road in 12 days working 5 hours a day. In how many days will 30 persons working 6 hours a day complete the work?

(SSC CPO S.I. Exam. 2003)

(a) 10 days (b) 13 days
(c) 14 days (d) 15 days

Explanation: Few persons, more days (Indirect).

More working hours/day, less days (Indirect).

Let the required number of days be x.

Persons	Working hours/day	Days
39 ↑	5 ↓	12 ↓
30	6	x

$\therefore$ $\left.\begin{matrix} 30 & : & 39 \\ 6 & : & 5 \end{matrix}\right\} :: 12 : x$

$\Rightarrow 30 \times 6 \times x = 39 \times 5 \times 12$

$\Rightarrow x = \frac{39 \times 5 \times 12}{30 \times 6} = 13$ days

Hence, the correct option is (b).

Section VII — Work and Wages

1. 2 men and 1 woman can complete a piece of work in 14 days while 4 women and 2 men can do the same work in 8 days. If a man gets ₹180 per day, then what amount will a woman get per day?

(SSC CGL Tier-II Bran, 2014 &2015)

(a) ₹150 (b) ₹140
(c) ₹120 (d) ₹160

Explanation: (2 men + 1 woman)'s 14 days' work

$\equiv$ (4 women + 2 men)'s 8 days' work

$\Rightarrow$ 28 men + 14 women $\equiv$ 32 women + 16 men

$\Rightarrow (28-16) = 12$ men $\equiv (32-14) = 18$ women

$\Rightarrow$ 2 men $\equiv$ 3 women

$\therefore$ 1 woman $\equiv \frac{2}{3}$ man

$\therefore$ Wages per day of 1 man = ₹180

$\therefore$ Wages per day of 1 woman

$= \frac{2}{3} \times 180 = ₹120$

Hence, the correct option is (c).

2. If a man earns ₹2000 for his first 50 hours of work in a week and is then paid one and a half times his regular hourly rate for any additional hours, then the hours must he work to make ₹2300 in a week is **(SSC CGL Tier-II Exam. 2015)**

(a) 6 hours (b) 4 hours
(c) 7 hours (d) 5 hours

Explanation: Earning in the first one hour $= \frac{2000}{50} = ₹40$

Earnings for additional 5 hours

$= 40 \times \frac{3}{2} \times 5 = ₹300$

Hence, the correct option is (d).

3. A, B and C are employed to do a piece of work for ₹575. A and C are supposed to finish $\frac{19}{23}$ of the work together. The amount shall be paid to B is

(SSC CGL Tier-II Exam 2014)

(a) ₹210 (b) ₹100
(c) ₹200 (d) ₹475

Explanation: Work done by B

$= 1 - \frac{19}{23} = \frac{23-19}{23} = \frac{4}{23}$

$\therefore (A + C) : B = \frac{19}{23} : \frac{4}{23} = 19 : 4$

$\therefore$ Sum of ratios = 19 + 4 = 23

$\therefore$ B's share $= \frac{4}{23} \times 575 = ₹100$

Hence, the correct option is (b).

4. A skilled, a half-skilled and an unskilled labourer work for 7, 8 and 10 days respectively and they together get ₹369 for their work. If the ratio of their each day's work is $\frac{1}{3} : \frac{1}{4} : \frac{1}{6}$, then how much does the trained labourer get (in ₹)?

(SSC CGL Tier-I Re-Exam. 2013 & 2014)

(a) 164 (b) 102.50
(c) 201.50 (d) 143.50

Explanation: Skilled: Half-skilled:

Unskilled $= \frac{1}{3} : \frac{1}{4} : \frac{1}{6}$

$= \left(\frac{1}{3} \times 12\right) : \left(\frac{1}{4} \times 12\right) : \left(\frac{1}{6} \times 12\right) = 4 : 3 : 2$

Share of the trained labourer

$= \frac{28}{(7 \times 4 + 8 \times 3 + 2 \times 10)} \times 369$

$= \frac{28}{(28 + 24 + 20)} \times 369$

$= \frac{28}{72} \times 369 = ₹143.50$

Hence, the correct option is (d).

5. A can do a piece of work in 16 days and B in 24 days. They take the help of C and they together finish the work in 6 days. If the total remuneration for the work is ₹400. The amount (in ₹) each will receive, in proportion, to do the work is

(SSC CGL Tier-I Re-Exam. 2013 & 2014)

(a) A: 150. B: 100. C: 150
(b) A: 100, B: 150. C: 150
(c) A: 150. B: 150, C: 100
(d) A: 100. B: 150, C: 100

Explanation: If C alone completes the work in x days, then

$\frac{1}{16} + \frac{1}{24} + \frac{1}{x} = \frac{1}{6}$

$\Rightarrow \frac{1}{x} = \frac{1}{6} - \frac{1}{16} - \frac{1}{24}$

$= \frac{8-3-2}{48} = \frac{1}{16}$

$\Rightarrow x = 16$ days

$\therefore$ Ratio of their remuneration

$= \frac{1}{16} : \frac{1}{24} : \frac{1}{16} = 3 : 2 : 3$

$\therefore$ A's remuneration $= \frac{3}{8} \times 400 = ₹150$

B's remuneration $= \frac{2}{8} \times 400 = ₹100$

C's remuneration $= \frac{3}{8} \times 400 = ₹150$

$\Rightarrow$ A: 150, B: 100, C: 150

Hence, the correct option is (a).

6. Three persons undertake to complete a piece of work for ₹1200. The first person can complete the work in 8 days, second person in 12 days and third person in 16 days. They complete the work with the help of a fourth person in 3 days. What does the fourth person get?

(SSC GL Tier-II Exam. 2013)

(a) ₹180 (b) ₹200

(c) ₹225 (d) ₹250

Explanation: If the fourth person completes the work in x days, then

$$\frac{3}{8}+\frac{3}{12}+\frac{3}{16}+\frac{3}{x}=1$$

$$\Rightarrow \quad \frac{1}{x}=\frac{1}{3}-\frac{1}{8}-\frac{1}{12}-\frac{1}{16}$$

$$=\frac{16-6-4-3}{48}=\frac{1}{16}$$

$$\therefore \quad x=16$$

$\therefore$ Ratio of wages

$$=\frac{1}{8}:\frac{1}{12}:\frac{1}{16}:\frac{1}{16}=6:4:3:3$$

Sum of ratios = 6 + 4 + 3 + 3 = 16

$\therefore$ Fourth person's share

$$=\frac{3}{16}\times 1200=₹225$$

Hence, the correct option is (c).

7. A, B and C together earn ₹150 per day while A and C together earn ₹94 and B and C together earn ₹76. The dairy earning of 'C' is **[SSC Constable (GD) Exam. 2013]**

(a) ₹56 (b) ₹20

(c) ₹34 (d) ₹75

Explanation: The daily earning of C = Dairy earning of $(A + C)$ and $(B + C)$ − Dairy earning of $(A + B + C)$ = 94 + 76 − 150 = ₹20

Hence, the correct option is (b).

8. A can do a piece of work in 12 days while B alone can do it in 15 days. With the help of C they can finish it in 5 days. If they are paid ₹960 for the whole work how much money A gets?

(SSC GL Tier-I Exam 2013)

(a) ₹480 (b) ₹240

(c) ₹320 (d) ₹400

Explanation: Work done by A and B in 5 days

$$=5\left(\frac{1}{12}+\frac{1}{15}\right)=5\left(\frac{5+4}{60}\right)=\frac{9}{12}=\frac{3}{4}$$

Time taken by C in doing $\frac{1}{4}$ work = 5 days

$\therefore$ C will complete in 20 days.

$\therefore$ Ratio of wages $=\frac{1}{12}:\frac{1}{15}:\frac{1}{20}=5:4:3$

$\therefore$ Amount received by A

$$=\frac{5}{12}\times 960=₹400$$

Hence, the correct option is (d).

9. A sum of money is sufficient to pay A's wages for 21 days and B's wages for 28 days. The same money is sufficient to pay the wages of both for

(SSC GL Tier-I Exam. 2013)

(a) $12\frac{1}{4}$ days (b) 14 days

(c) $24\frac{1}{2}$ days (d) 12 days

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

B's 1 day work = $\frac{1}{28}$

Total work done by both

$$=\frac{1}{21}+\frac{1}{28}=\frac{4+3}{84}=\frac{1}{12}$$

$\therefore$ Amount is sufficient to pay 12 days wages of both.

Hence, the correct option is (d).

10. A and B were assigned to do a job for an amount of ₹1200. A alone can do it in 15 days, while B can do it in 12 days. With the help of C, they can finish in 5 days. The share of amount that C earns is

(SSC Multi-Tasking Staff Exam. 2013)

(a) ₹300 (b) ₹400

(c) ₹500 (d) ₹600

Explanation: According to the question,

$$\frac{1}{15}+\frac{1}{12}+\frac{1}{C}=\frac{1}{5}$$

Let C's work in day be $\frac{1}{C}$.

$$\Rightarrow \quad \frac{1}{C}=\frac{1}{5}-\frac{1}{15}-\frac{1}{12}$$

$$=\frac{12-4-5}{60}=\frac{1}{20}$$

$$\therefore A:B:C=\frac{1}{15}:\frac{1}{12}:\frac{1}{20}=4:5:3$$

$\therefore$ C's share $=\frac{3}{12}\times 1200=₹300$

Hence, the correct option is (a).

11. Stanie and Paul take a piece of work for ₹28800. One alone could do it in 36 days, the other in 48 days. With the assistance of an expert, they finish it in 12 days. How much remuneration the expert should get? **(SSC Multi-Tanking Staff Exam. 2013)**

(a) ₹10000 (b) ₹18000

(c) ₹16000 (d) ₹12000

Explanation: Expert's 1 day work

$$=\frac{1}{12}-\frac{1}{36}-\frac{1}{48}=\frac{12-4-3}{144}=\frac{5}{144}$$

$\therefore$ Ratio of their respective work for 1 day

$$=\frac{1}{36}:\frac{1}{48}:\frac{5}{144}=4:3:5$$

$\therefore$ Expert's share $=\frac{5}{12}\times 28800=₹12000$

Hence, the correct option is (d).

12. If there is a reduction in the number of workers in a factory in the ratio of 15 : 11 and an increment in their wages in the ratio 22 : 25, then the ratio by which the total wages of the workers should be decreased is **(SSC CHSL DEO & LDC Exam. 2012)**

(a) 6 : 5 (b) 5 : 6

(c) 3 : 7 (d) 3 : 5

Explanation: Required ratio = 15 × 22 : 11 × 25 = 6 : 5

Hence, the correct option is (a).

13. Two men undertake a job for ₹960. They can complete it in 16 days and 24 days respectively. They work along with a third man and take 8 days to complete it. Then the share of the third man should be

(SSC CHSL DEO &LDC Exam. 2012)

(a) ₹155 (b) ₹165

(c) ₹160 (d) ₹150

Explanation: Work done by the third person in 1 day

$$=\frac{1}{8}-\frac{1}{16}-\frac{1}{24}=\frac{6-3-2}{48}=\frac{1}{48}$$

Ratio of their 1 day work

$$=\frac{1}{16}:\frac{1}{24}:\frac{1}{48}=3:2:1$$

$\therefore$ Share of the third person

$$=\frac{1}{(3+2+1)}\times 960=\frac{960}{6}=160$$

Hence, the correct option is (c).

14. If 5 men or 7 women can earn ₹5250 per day, how much would 7 men and 13 women earn per day? **(SSC CGL Tier-I Exam. 2010)**

(a) ₹11600 (b) ₹11700
(c) ₹16100 (d) ₹17100

Explanation: 5 men ≡ 7 women
[Both earn same amount in 1 day]

$\therefore$ 7 men $\equiv \frac{7}{5} \times 7 = \frac{49}{5}$ women

$\therefore$ 7 men + 13 women

$= \frac{49}{5} + 13 = \frac{114}{5}$ women

Now,

$\because$ 7 women ≡ 5250

$\therefore \frac{114}{5}$ women $\equiv \frac{5250}{7} \times \frac{114}{5} = 17100$

Hence, the correct option is (d).

15. 2 men and 1 woman together can complete a piece of work in 14 days, while 4 women and 2 men together can do it in 8 days. If a man gets ₹600 per day, how much should a woman get per day?

(SSC DEO Exam. 2008)

(a) ₹400 (b) ₹450
(c) ₹480 (d) ₹360

Explanation: According to the question, (2×14) men + 14 women.

= 16 men + 32 women

$\Rightarrow$ (28 − 16) men = (32 − 14) women
$\Rightarrow$ 12 men − 18 women
$\Rightarrow$ 2 men = 3 women

$\therefore$ 1 woman $= \frac{2}{3}$ man

$\therefore$ Amount received by 1 woman per day

$= \frac{2}{3} \times 600 = 400$

Hence, the correct option is (a).

16. Two men undertook to do a job for ₹1400. One of them can do it alone in 7 days and the other in 8 days. With the assistance of a boy they together completed the work in 3 days. How much money will the boy get?

(SBC CGL Prelim Exam. 2007)

(a) ₹300 (b) ₹325
(c) ₹275 (d) ₹250

Explanation: First man's 1 day work $= \frac{1}{7}$

Second man's 1 day work $= \frac{1}{8}$

Let, the boy's 1 day work $= \frac{1}{x}$

$\therefore \quad \frac{1}{7} + \frac{1}{8} + \frac{1}{x} = \frac{1}{3}$

$\Rightarrow \frac{1}{x} = \frac{1}{3} - \frac{1}{7} - \frac{1}{8} = \frac{56 - 24 - 21}{168} = \frac{11}{168}$

$\therefore$ Ratio of their one day work

$= \frac{1}{7} : \frac{1}{8} : \frac{11}{168} = 24 : 21 : 11$

Sum of the ratios = 24 + 21 + 11 = 56
$\therefore$ Boy's share in wages

$= \frac{11}{56} \times 1400 = ₹275$

Hence, the correct option is (c).

17. A labourer was appointed by a contractor on the condition that he would be paid ₹75 for each day of his work but would be fined at the rate of ₹15 per day for his absence, apart from losing his wages. After 20 days, the contractor paid the labourer ₹1140. The number of days the labourer abstained from work was

(SSC CGL Prelim Exam. 2007)

(a) 3 (b) 5
(c) 4 (d) 2

Explanation: Total salary for 20 days = $(75 \times 20) = 1500$

Actual salary received = 1140

Difference = (1500 − 1140) = 360

Money deducted for 1 day's absence from work = (15 + 75) = 90

$\therefore$ Number of days he was absent $= \frac{360}{90}$

= 4 days

Hence, the correct option is (c).

18. *A*, *B* and *C* completed a work costing ₹1800. *A* worked for 6 days, *B* for 4 days and *C* for 9 days. If their daily wages are in the ratio of 5 : 6 : 4, how much amount will be received by *A*?

(SSC CGL Prelim Exam. 2007)

(a) ₹800 (b) ₹600
(c) ₹900 (d) ₹750

Explanation: Ratio of wages of *A*, *B* and *C* respectively

$= 5 \times 6 : 6 \times 4 : 4 \times 9$

$= 30 : 24 : 36 = 5 : 4 : 6$

$\therefore$ Amount received by *A*

$= \frac{5}{5+4+6} \times 1800 = \frac{5}{15} \times 1800 = 600$

Hence, the correct option is (b).

19. A daily-wage labourer was engaged for a certain number of days for ₹5750; but being absent on some of those days he was paid only ₹5000. What was his maximum possible daily wage?

(SSC CPO S.I. Exam.2006)

(a) ₹125 (b) ₹250
(c) ₹375 (d) ₹500

Explanation: It is required to find the highest common factor of 5750 and 5000, because his daily wage is their common factor.

```
5000) 5750 (1
      5000
       750) 5000 (6
            4500
             500) 750 (1
                  500
                  250) 500 (2
                       500
                         x
```

Hence, the daily wage is 250.
Hence, the correct option is (b).

20. A man and a boy received ₹800 as wages for 5 days for the work they did together. The man's efficiency in the work was three times that of the boy. What are the daily wages of the boy?

(SSC CGL Prelim Exam. 2005)

(a) ₹76 (b) ₹56
(c) ₹44 (d) ₹40

Explanation: Man: boy = 3 : 1

$\therefore$ Boy's share $= \frac{1}{4} \times 800 = 200$

$\therefore$ The daily wages of boy $= \left(\frac{200}{5}\right) = 40$

Hence, the correct option is (d).

21. *A* and *B* can complete a piece of work in 15 days and 10 days respectively. They contracted to complete the work for ₹30,000. The share of *A* in the contracted money will be **(SSC CGL Prelim Exam. 2004)**

(a) ₹18000 (b) ₹16500
(c) ₹12500 (d) ₹12000

Explanation: *A*'s 1 day work $= \frac{1}{15}$

B's 1 day work $= \frac{1}{10}$

Ratio $= \frac{1}{15} : \frac{1}{10} = 2 : 3$

Sum of the ratios = 2 + 3 = 5

$\therefore$ *A*'s share $= \frac{2}{5} \times 30000 = 12000$

Hence, the correct option is (d).

22. A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for ₹3200. With the help of C they completed the work in 3 days. How much is to be paid to C?

(SSC CGL Prelim Exam. 2004)

(a) ₹375 (b) ₹400
(c) ₹600 (d) ₹800

Explanation: A's 1 day work $= \frac{1}{6}$

B's 1 day work $= \frac{1}{8}$

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

$\therefore$ C's l day work

$$= \frac{1}{3} - \frac{1}{6} - \frac{1}{8} = \frac{8-4-3}{24} = \frac{1}{24}$$

$\therefore$ Ratio of their 1 day work respectively

$$= \frac{1}{6} : \frac{1}{8} : \frac{1}{24} = 4 : 3 : 1$$

Sum of the ratios = 4 + 3 + 1 = 8

$\therefore$ C's share $= \frac{1}{8} \times 3200 = 400$

Hence, the correct option is (b).

23. If 6 persons working 8 hours a day earn ₹8400 per week, then 9 persons working 6 hours a day will earn how much per week? **(SSC CGL Prelim Exam. 2003)**

(a) ₹8400
(b) ₹16800
(c) ₹9450
(d) ₹16200

Explanation:

More persons, more earning
Less working hours, less earning
} Direct proportion

$$\left.\begin{matrix} 6 : 9 \\ 8 : 6 \end{matrix}\right\} :: 8400 : x$$

Where x = required earning

Therefore,

$\therefore$ $6 \times 8 \times x = 9 \times 6 \times 8400$

or $$x = \frac{9 \times 6 \times 8400}{6 \times 8} = 9450$$

Hence, the correct option is (c).

24. A and B undertook to do a piece of work for ₹4500. A alone could do it in 8 days and B alone in 12 days. With the assistance of C they finished the work in 4 days. Then C's share of the money is

(SSC CGL Prelim Exam. 2003)

(a) ₹2250 (b) ₹1500
(c) ₹750 (d) ₹375

Explanation: C's 1 day work

$$= \frac{1}{4} - \left(\frac{1}{8} + \frac{1}{12}\right) = \frac{1}{4} - \left(\frac{3+2}{24}\right)$$

$$= \frac{1}{4} - \frac{5}{24} = \frac{6-5}{24} = \frac{1}{24}$$

$A : B : C = \frac{1}{8} : \frac{1}{12} : \frac{1}{24} = 3 : 2 : 1$

C's share $= \left(\frac{1}{6} \times 4500\right) = 750$

Hence, the correct option is (c).

25. The average wage of 500 workers was found to be ₹200. Later on, it was discovered that the wages of two workers were misread as 180 and 20 instead of 80 and 220. The correct average wage is

(SSC CGL Prelim Exam.2000)

(a) ₹200.10 (b) ₹200.20
(c) ₹200.50 (d) ₹201.00

Explanation: Total wages of 500 workers $= 500 \times 200 = 100000$

Now, according to question, the correct average is

$$= \frac{(100000 - 180 - 20 + 80 + 220)}{500}$$

$$= \frac{100100}{500} = ₹200.20$$

Hence, the correct option is (b).

26. Suman can do a work in 3 days. Sumati can do the same work in 2 days. Both of them finish the work together and get ₹150. What is the share of Suman?

(SSC CGL Prelim Exam. 1999)

(a) ₹30 (b) ₹60
(c) ₹70 (d) ₹75

Explanation: Ratio of Suman's and Sumati's

$$1 \text{ day work} = \frac{1}{3} : \frac{1}{2} = 2 : 3$$

Sum of the ratios = 2 + 3 = 5

Suman's share $= \frac{2}{5} \times 150 = 60$

Hence, the correct option is (b).

Section VIII — Miscellaneous Questions

1. Every Sunday, Gin jogs 3 miles. For rest of the week, each day he jogs 1 mile more than the previous day. How many miles Gin jogs in 2 weeks?

[SSC CGL Prelim Exam. 2016]

(a) 42 (b) 63
(c) 84 (d) 98

Explanation: Sunday Monday Tuesday Wednesday Thursday Friday Saturday

$$= 3 + 4 + 5 + 6 + 7 + 8 + 9$$

$$= 42 \text{ in one week.}$$

$\therefore$ In two weeks $= 2 \times 42 = 84$ miles

Hence, the correct option is (c).

2. Work done by $(x + 4)$ men in $(x + 5)$ days is equal to the work done by $(x - 5)$ men in $(x + 20)$ days. Then the value of x is

[SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 2015]

(a) 20 (b) 25
(c) 30 (d) 15

Explanation: According to the question,

$$M_1 D_1 = M_2 D_2$$

$\Rightarrow$ $$(x + 4)(x + 5)$$

$$= (x - 5)(x + 20)$$

$\Rightarrow$ $$x^2 + 5x + 4x + 20$$

$$= x^2 - 5x + 20x - 100$$

$\Rightarrow$ $$9x + 20 = 15x - 100$$

$\Rightarrow$ $$15x - 9x = 100 + 20$$

$\Rightarrow$ $$6x = 120$$

$$x = \frac{120}{6} = 20$$

Hence, the correct option is (a).

3. 150 workers were engaged to finish a piece of work in a certain number of days. Four workers dropped on the second day, four more workers dropped on third day

and so on. It takes 8 more days to finish the work now. Find the number of days in which the work was completed?

[SSC CHSL (10+2) LDC, DEO & PA/SA Exam,2015]

(a) 28 (b) 24
(c) 25 (d) 30

Explanation: Let 150 workers complete the work in x days.

$\therefore$ $150 \times x = 150 + 146 + \ldots$ to $(x + 8)$ terms

On substituting $x = 17$

LHS = 150 x 17 = 2550

RHS = 150 + 146 + … to 25 terms

$a = 150, d = -4, n = 25$

$$\therefore \quad S = \frac{n}{2}\left[2a + (n-1)d\right]$$

$$= \frac{25}{2}\left[2 \times 150 + 24 \times (-4)\right]$$

$$= \frac{25}{2}(300 - 96) = \frac{25 \times 204}{2} = 2550$$

Note: It is better to solve by options.

Hence, the correct option is (c).

4. P and Q together can do a job in 6 days. Q and R can finish the same job in $\frac{60}{7}$ days. P started the work and worked for 3 days. Q and R continued for 6 days. Then the difference of days in which R and P can complete the job is

(SSC CGL Tier-II Exam, 2015)

(a) 15 (b) 10
(c) 8 (d) 12

Explanation: $(P + Q)$'s 1 day work $= \frac{1}{6}$

$(Q + R)$'s 1 day work $= \frac{7}{60}$

Let P alone do the work in x days.

According to the question,

$$\frac{3}{x} + \frac{6 \times 7}{60} = 1$$

$$\Rightarrow \quad \frac{3}{x} = 1 - \frac{7}{10} = \frac{3}{10}$$

$$\Rightarrow \quad x = 10 \text{ days}$$

$\therefore$ Q's 1 day work

$$= \frac{1}{6} - \frac{1}{10} = \frac{5-3}{30} = \frac{1}{15}$$

R's 1 day work

$$= \frac{7}{60} - \frac{1}{15} = \frac{7-4}{60} = \frac{1}{20}$$

$\therefore$ Time taken by $R = 20$ days

$\therefore$ Required answer $= 20 - 10 = 10$ days

Hence, the correct option is (b).

5. 8 workers can build a wall 18 m long, 2 m broad and 12 m high in 10 days, working 9 hours a day. Find how many workers will be able to build a wall 32 m long, 3 m broad and 9 m high in 8 days working 6 hours a day?

(SSC CGL Tier-I Re-Exam, 2015)

(a) 16 (b) 20
(c) 30 (d) 10

Explanation:

Length	Breadth	Height	Working hours	Days	Workers
18 ↓	2 ↓	12 ↓	9 ↑	10 ↑	8 ↓
32 ↓	3 ↓	9 ↓	6 ↑	8 ↑	x ↓

$$\Rightarrow 18 \times 2 \times 12 \times 6 \times 8x = 32 \times 3 \times 9 \times 9 \times 10 \times 8$$

$$\Rightarrow \quad x = \frac{32 \times 3 \times 9 \times 9 \times 10 \times 8}{18 \times 2 \times 12 \times 6 \times 8}$$

$$= 30 \text{ days}$$

Hence, the correct option is (c).

6. If 12 carpenters working 6 hours a day can make 460 chairs in 240 days, then the number of chairs made by 18 carpenters in 36 days each working 8 hours a day is

(SSC CAPFs SI, CISF ASI & DP SI Exam, 2015)

(a) 92 (b) 132
(c) 138 (d) 126

Explanation:

Carpenters	Working hours/day	Days	Chairs
12 ↓	6 ↓	240 ↓	460 ↓
18 ↓	8 ↓	36 ↓	x ↓

$$\Rightarrow \quad 12 \times 6 \times 240 \times x$$

$$\Rightarrow \quad = 18 \times 8 \times 36 \times 460$$

$$\Rightarrow \quad x = \frac{18 \times 8 \times 36 \times 460}{12 \times 6 \times 240} = 138$$

Hence, the correct option is (c).

7. A farmer can plough a field working 6 hours per day in 18 days. The worker has to work how many hours per day to finish the same work in 12 days?

(SSC GL Tier-II Exam. 2013)

(a) 7 hrs (b) 9 hrs
(c) 11 hrs (d) 13 hrs

Explanation: $D_1 T_1 = D_2 T_2$

$$\Rightarrow \quad 18 \times 6 = 12 \times T_2$$

$$\Rightarrow \quad T_2 = \frac{18 \times 6}{12} = 9 \text{ hours}$$

Hence, the correct option is (b).

8. Two men can do a piece of work in x days. But y women can do that in 3 days. Then the ratio of the work done by 1 man and 1 woman is

(SSC FCI Assistant Grade-II Main Exam.2013)

(a) $3y : 2x$ (b) $2x : 3y$
(c) $x : y$ (d) $2y : 3x$

Explanation: 1 man's 1 day work $= \frac{1}{2x}$

1 woman's 1 day work $= \frac{1}{3y}$

$\therefore$ Required ratio $= \frac{1}{2x} : \frac{1}{3y} = 3y : 2x$

Hence, the correct option is (a).

9. A can do a work in 12 days. When he had worked for 3 days, B joined him. If they complete the work in 3 more days, in how many days can B alone finish the work?

(SSC CGL Tier-I Exam .2011)

(a) 6 days (b) 12 days
(c) 4 days (d) 8 days

Explanation: Let B alone do the work in x days.

$$\therefore \quad 6 \times \frac{1}{12} + 3 \times \frac{1}{x} = 1$$

$$\Rightarrow \quad \frac{1}{2} + \frac{3}{x} = 1$$

$$\Rightarrow \quad \frac{3}{x} = \frac{1}{2} \Rightarrow x = 6 \text{ days}$$

Hence, the correct option is (a).

10. A man and a woman working together can do a certain work in 18 days. Their skills in doing the work are in the ratio 3 : 2. How many days will the woman take to finish the work alone?

(SSC CHSL DEO & LDC Exam.2011)

(a) 45 days (b) 36 days
(c) 27 days (d) 30 days

Explanation: Man: Woman (efficiency) = 3 : 2

i.e., woman completes $\frac{2}{5}$th work in 18 days.

$\therefore$ Time taken by the woman to complete the whole work $= \frac{18 \times 5}{2} = 45$ days

Hence, the correct option is (a).

11. Working efficiencies of P and Q for completing a piece of work are in the ratio 3 : 4. The number of days to be taken by them to complete the work will be in the ratio **(SSC CISF ASI Exam .2010)**

(a) 3 : 2 (b) 2 : 3

(c) 3 : 4 (d) 4 : 3

Explanation: Efficiency and time taken are inversely proportional.

$\therefore$ Required ratio = 4 : 3

Hence, the correct option is (d).

12. Twenty women together can complete a work in 16 days. 16 men together can complete the same work in 15 days. The ratio of the working capacity of a man to that of a woman is **(SSC CHSL DEO & LDC Exam.2010)**

(a) 3 : 4 (b) 4 : 3

(c) 5 : 3 (d) 4 : 5

Explanation: 20×16 women

$$= 16 \times 15 \text{ men}$$

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

$$\Rightarrow \quad \frac{\text{men}}{\text{women}} = \frac{4}{3}$$

Hence, working capacity of man: woman = 4 : 3

Hence, the correct option is (b).

13. A road of 5 km length will be constructed in 100 days so 280 workers were employed. But after 80 days it was found that only $3\frac{1}{2}$ km road was completed. Now how many more people were needed to finish the work in the specified time? **(SSC CPO S.I. Exam. 2009)**

(a) 480 (b) 80

(c) 200 (d) 100

Explanation: Remaining work

$$= 5 - \frac{7}{2} = \frac{3}{2}$$

$$M_1 \times D_1 \times W_2 = M_2 \times D_2 \times W_1,$$

$$280 \times 80 \times \frac{3}{2}$$

$$\Rightarrow \quad M_2 \times 20 \times \frac{7}{2}$$

$$\Rightarrow \quad M_2 = \frac{280 \times 80 \times 3}{20 \times 7} = 480$$

$\therefore$ Required number of additional men = 480 – 280 = 200

Hence, the correct option is (c).

14. If two persons, with equal abilities, can do two jobs in two days, then 100 persons with equal abilities can do 100 similar jobs in **(SSC CGL Prelim Exam. 2008)**

(a) 100 days (b) 10 days

(c) 5 days (d) 2 days

Explanation: According to the question, 2 persons with equal abilities can do 1 job in 1 day.

$\therefore$ Time taken by 1 man to complete 1 job = 2 days

$\Rightarrow$ Time taken by 100 persons in completing 100 jobs = 2 days

Hence, the correct option is (d).

15. Working 5 hours a day, A can complete a work in 8 days and working 6 hours a day, B can complete the same work in 10 days. Working 8 hours a day, they can jointly complete the work in **(SSC CGL Prelim Exam. 2008)**

(a) 3 days (b) 4 days

(c) 4.5 days (d) 5.4 days

Explanation: Working 5 hours a day, A can complete a work in 8 days.

i.e, A can complete the work in 40 hours.

Similarly, B will complete the same work in 60 hours.

$\therefore$ (A + B)'s 1 hour's work

$$= \frac{1}{40} + \frac{1}{60} = \frac{3+2}{120} = \frac{5}{120} = \frac{1}{24}$$

Hence, A and B together will complete the work in 24 hours.

$\therefore$ They can complete the work in 3 days working 8 hours a day.

Hence, the correct option is (a).

16. A job can be completed by 12 men in 12 days. How many extra days will be needed to complete the job if 6 men leave after working for 6 days? **(SSC CGL Prelim Exam. 2008)**

(a) 3 days (b) 6 days

(c) 12 days (d) 24 days

Explanation: Work done by 12 men in 6 days = $\frac{1}{2}$

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

6 men leave the work.

$\therefore$ Time taken = $\frac{12 \times 12}{6 \times 2} = 12$ days

Hence, the correct option is (c).

17. Ganga and Saraswati, working separately can mow a field in 8 and 12 hours respectively. If they work in stretches of one hour alternately, Ganga beginning at 9 a.m., when will the moving be completed? **(SSC CGL Prelim Exam. 2008)**

(a) 6 p.m. (b) 6.30 p.m.

(c) 5 p.m. (d) 5.30 p.m.

Explanation: Part of the field mowed by Ganga and Saraswati in first 2

$$\text{hours} = \frac{1}{8} + \frac{1}{12} = \frac{3+2}{24} = \frac{5}{24}$$

$\therefore$ Part of the field mowed in first 8 hours

$$= \frac{5 \times 4}{24} = \frac{20}{24} = \frac{5}{6}$$

$$\text{Remaining work} = 1 - \frac{5}{6} = \frac{1}{6}$$

Now, it is the turn of Ganga, part of work done by Ganga in 1 hour = $\frac{1}{8}$

$$\text{Remaining work} = \frac{1}{6} - \frac{1}{8} = \frac{4-3}{24} = \frac{1}{24}$$

Now, time taken by Saraswati in completing this part of work

$$= \frac{1}{24} \times 12 = \frac{1}{2}$$

$\therefore$ Total time = $9\frac{1}{2}$ hours

The moving starts at 9 a.m.

Hence, the moving will be completed at 6.30 p.m.

Hence, the correct option is (b).

18. 60 men could complete a work in 250 days. They worked together for 200 days. After that the work had to be stopped for 10 days due to bad weather. How many more men should be engaged to complete the work in time? **(SSC CGL Prelim Exam. 2007)**

(a) 10 (b) 15

(c) 18 (d) 20

Explanation: 60 men can complete a work in 250 days.

$\therefore$ Work done by 60 men in 1 day = $\frac{1}{250}$

$\Rightarrow$ Work done by 60 men in 200 days = $\frac{200}{250} = \frac{4}{5}$

$$\text{Remaining work} = 1 - \frac{4}{5} = \frac{1}{5}$$

Work is stopped for 10 days.

Now, $\frac{1}{5}$ work is to be complete by x men in 40 days.
60 men can complete $\frac{1}{5}$ work in 50 days.

Days	Men
50 ↑	60 ↓
40	x

$\therefore \quad 40 : 50 : 60 : x$

$\Rightarrow \quad 40x = 50 \times 60$

$\Rightarrow \quad x = \frac{50 \times 60}{40} = 75$

Hence, 15 more men should be engaged.
Hence, the correct option is (b).

19. A work could be completed in 100 days by some workers. However, due to the absence of 10 workers, it was completed in 110 days. The original number of workers was **(SSC CGL Prelim Exam. 2005)**

(a) 100 (b) 110
(c) 55 (d) 50

Explanation: Let the original number of workers = x. Then, $x \times 100 = (x - 10) \times 110$

$\Rightarrow \quad 10x = 11x - 110$

$\Rightarrow \quad x = 110$

Hence, the correct option is (b).

20. A man can do a piece of work in 5 days, but with the help of his son, he can do it in 3 days. In what time can the son do it alone? **(SSC CGL Prelim Exam. 2004)**

(a) 7 days (b) 8 days
(c) $7\frac{1}{2}$ days (d) $6\frac{1}{2}$ days

Explanation: Let the son take x days to do the work.

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

$\Rightarrow \quad \frac{x+5}{5x} = \frac{1}{3}$

$\Rightarrow \quad 3x + 15 = 5x$

$\Rightarrow \quad 2x = 15 \Rightarrow x = \frac{15}{2}$

$\Rightarrow \quad 7\frac{1}{2}$ days

Hence, the correct option is (c).

21. A certain number of men can do a work in 60 days. If there were eight more men, it could be completed in 10 days less. How many men were there in the beginning? **(SSC CGL Prelim Exam. 2004)**

(a) 70 (b) 55
(c) 45 (d) 40

Explanation: Let the number of men in the beginning be x.

Then,

$\frac{x+8}{x} = \frac{60}{50}$

$\Rightarrow \quad \frac{x+8}{x} = \frac{6}{5}$

$\Rightarrow \quad 6x = 5x + 40$

$\Rightarrow \quad x = 40$

Hence, the correct option is (d).

22. 12 persons can do a piece of work in 4 days. How many persons are required to complete 8 times the work in half the time? **(SSC CPO S.I. Exam. 2004)**

(a) 192 (b) 190
(c) 180 (d) 144

Explanation: 12 persons can complete a work in 4 days.

$\Rightarrow$ 24 persons can complete the work in 2 days.
$\Rightarrow$ 24 persons can complete the 8 times work in 16 days.
$\Rightarrow 24 \times 8$ persons = 192 persons can complete the 8 times work in 2 days.
Hence, the correct option is (a).

23. A can do a piece of work in 60 days. He works for 15 days and then B alone finishes the remaining work in 30 days. The two together can finish the work in **(SSC CGL Prelim Exam. 2003)**

(a) 24 days (b) 25 days
(c) 30 days (d) 32 days

Explanation: Work done by A in 15 days $= \frac{1}{60} \times 15 = \frac{1}{4}$

Remaining work $= \left(1 - \frac{1}{4}\right) = \frac{3}{4}$

Now, $\frac{3}{4}$ work is done by B in 30 days.

Whole work will be done by B in $\frac{30 \times 4}{3} =$ 40 days

A's 1 day work $= \frac{1}{60}$ and B's 1 day work $= \frac{1}{40}$

($A + B$)'s 1 day work

$= \frac{1}{60} + \frac{1}{40} = \frac{2+3}{120} = \frac{5}{120} = \frac{1}{24}$

Hence, both will finish the work in 24 days.
Hence, the correct option is (a).

24. A can do a certain work in the same time in which B and C together can do it. If A and B together could do it in 10 days and C alone in 50 days, then B alone could do the work in **(SSC CGL Prelim Exam. 2003)**

(a) 15 days (b) 20 days
(c) 25 days (d) 30 days

Explanation: A's 1 day work = (B + C)'s 1 day work (i)

($A + B$)'s 1 day work $= \frac{1}{10}$ (ii)

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

($A + B + C$)'s 1 day work,

$= \frac{1}{10} + \frac{1}{50} = \frac{5+1}{50} = \frac{6}{50} = \frac{3}{25}$ (iii)

($A + A$)'s 1 day's work $= \frac{3}{25}$

By (i) and (iii)

A's 1 day work $= \frac{3}{50}$

B's 1 day work $= \frac{1}{10} - \frac{3}{50} = \frac{5-3}{50} = \frac{2}{50} = \frac{1}{25}$

Hence, B alone will complete the work in 25 days.
Hence, the correct option is (c).

25. If the expenditure of gas on burning 6 burners for 6 hours a day for 8 days is ₹450, then how many burners can be used for 10 days at 5 hours a day for ₹625? **(SSC CGL Prelim Exam. 2002)**

(a) 12 (b) 16
(c) 4 (d) 8

Explanation: Tricky Approach

$\left.\begin{matrix} 450 : 625 \\ 10 : 8 \\ 5 : 6 \end{matrix}\right\} :: 6 : x$

$\Rightarrow \quad 450 \times 10 \times 5 \times x$

$= 625 \times 8 \times 6 \times 6$

$\Rightarrow \quad x = \frac{625 \times 8 \times 6 \times 6}{450 \times 10 \times 5} = 8$

Hence, the correct option is (d).

26. A contractor undertakes to make a road in 40 days and employs 25 men. After 24 days, he finds that only one-third of the road is made. How many extra men should he employ so that he is able to complete the work 4 days earlier?

(SSC CGL Prelim Exam. 2000)

(a) 100 (b) 60

(c) 75 (d) None of these

Explanation: Scheduled time to complete the work = 40 days

25 men in 24 days do $\frac{1}{3}$ work.

$\therefore$ 1 man in 1 day does

$$\frac{1}{3\times 25\times 24}=\frac{1}{1800} \text{ work .}$$

Work remaining $= 1-\frac{1}{3}=\frac{2}{3}$

The work is to be completed 4 days before schedule, i.e., in (40 – 4) 36 days.

Number of days left for $\frac{2}{3}$ rd work= 36 – 24 = 12 days

$\frac{1}{1800}$ work is done in 1 day by 1 man.

$\therefore$ $\frac{2}{3}$ work will be done in 12 days by

$1800\times\frac{2}{3}\times\frac{1}{12}=100$ men

25 men are already working

$\therefore$ Extra men to be employed= 100 – 25 = 75

Hence, the correct option is (c).

27. A certain number of men can complete a job in 30 days. If there were 5 men more, it could be completed in 10 days less. How many men were in the beginning? **(SSC CGL Prelim Exam. 2000)**

(a) 10 (b) 15

(c) 20 (d) 25

Explanation: Let initially the number of men be x.

$\Rightarrow$ According to the question,

$$M_1D_1W_2 = M_2D_2W_1$$

$$x\times 30=(x+5)\times(30-10)$$

$$x\times 30=20x+100$$

$$30x-20x=100$$

$$x=10$$

Hence, the correct option is (a).