

TIME AND WORK

- A's one day work = $1/\text{Time taken by 'A' to complete a work}$
- If A's 1 day's work = $(1/n)$, then A can finish the work in 'n' days
- If 'A' is thrice as good a workman as 'B' then ratio of work done by 'A' and 'B' = 3:1
- Ratios of time taken by A and B to finish a work = 1:3

Problems:

Q.1) A can do a piece of work in 20 days and B can do it in 30 days. How long will they take to do the work together?

- (A) 10 days
- (B) 12 days
- (C) 11 days
- (D) 20 days

Ans: B

Solution: Work done by A in 1 day = $1/20$, Work done by B in 1 day = $1/30$

Work done by A and B in 1 day = $1/20 + 1/30 = (3+2)/60 = 5/60 = 1/12$ of the work

Total number of days required to finish the work by A and B = $1/(1/12) = 12$ days

Q.2) Ashraf can reap a field in 9 days, which Govind alone can reap in 12 days. In how many days both together, can reap this field?

- (A) $36/7$ days
- (B) $29/7$ days
- (C) $43/7$ days
- (D) $36/8$ days

Ans: A

Solution: Ashraf = $1/9$, Govind = $1/12$

to find out their total work we will add their one-day work = $1/9 + 1/12$

together they can reap the field is = $36/7$ days

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Q.3) A and B can do a piece of work in 8 days but "A" alone can do it in 12 days. How many days would B alone can do the same work

- (A) 20
- (B) 23
- (C) 22
- (D) 24

Ans: D

Solution: (A+B)'s one day work = $1/8$, A's one day work = $1/12$

B's one day work = $(1/8) - (1/12) = 1/24$

So, B alone can do the same work in 24 days.

Q.4) A and B together can complete a piece of work in 20 days and B alone in 30 days. In how many days can A alone complete the work?

- (A) 60
- (B) 10
- (C) 50
- (D) 45

Ans: A

Solution: Part of work A and B can do in 1 day = $1/20$

Part of work A can do in 1 day = $1/30$

Part of work B alone can do in a day = $1/20 - 1/30 = 1/60$

B alone can do the work in 60 days

Q.5) A and B together can complete a work in 15 days. B alone can complete the game work in 45 days. Then

- (A) A is twice as good workman as B
- (B) B is twice as good workman as A
- (C) A is thrice as good workman as B
- (D) B is thrice as good workman as A

Ans: A

Solution: If A and B can complete it in 15 days then their one day's work is $1/15$.

If B alone can do it in 45 days then B's one day work is $1/45$.

Therefore, A's one day work is = Their combined 1 day's work - B's one day work = $1/15 - 1/45 = 2/45$

So therefore, A can do the work twice the speed that of B.

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Q.6) A can finish a job in 20 days and B can complete it in 30 days. They work together and finish the job. If Rs. 600 is paid as wages, then the share of A and B

- (A) 240, 360
- (B) 360, 240
- (B) 300, 300
- (D) 400, 200

Ans: B

Solution: Time taken by A = 20 days; Work done by A in 1 day = $1/20$

Time taken by B = 30 days; Work done by B in 1 day = $1/30$

Wages = 600

Ratio of work done by A & B in 1-day = $1/20 : 1/30$ So, The ratio of the wages will be 3 : 2

$$3X + 2X = 600 \Rightarrow X = 120$$

Therefore, A's wage = 360, B's Wage = 240

Q.7) X can do a piece of work in 18 days and Y can do it 24 days. How much Y get if they finish the work and earn Rs. 42,000

- (A) Rs. 24,000
- (B) Rs. 18,000
- (C) Rs. 20,000
- (D) Rs. 22,000

Ans: B

Solution: Time Ratio: - $x : y = 18 : 24 = 3 : 4$. so, Efficiency Ratio = $x : y = 4 : 3$.

Now, Given That, Both Earn Rs.42,000 Total.

Therefore, y gets = $(3/7)$ of 42000 = 18,000

Q.8) A can do a piece of work in 10 days. B can do it in 15 days. How much does each of them get if they finish the work and earn Rs. 1,500?

- (A) Rs. 700, Rs. 800
- (B) Rs. 900, Rs. 600
- (C) Rs. 500, Rs. 1,000
- (D) Rs. 800, Rs. 700

Ans: B

Solution: Time taken by A = 10 days; Work done by A in 1 day = $1/10$

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Time taken by B = 15 days; Work done by B in 1 day = $1/15$

Wages = 1500

Ratio of work done by A & B in 1-day = $1/10 : 1/15$ So, The ratio of the wages will be 3 : 2

$$3X + 2X = 1500 \Rightarrow X = 300$$

Therefore, A's wage = 900, B's Wage = 600

Q.9) A is twice as good a workman as B and together they finish a piece of work in 14 days. In how many days can A alone finish the work?

- (A) 11
- (B) 28
- (C) 21
- (D) 42

Ans: C

Solution: Let us assume work done by A = $2x$, Work done by B = x

Together they complete the work in 14 days. Then total work = $3X * 14 = 42x$

A alone finish the work = $42x / 2x = 21$ days

Q.10) A alone can complete a piece of work of Rs. 800 in 8 days; but by engaging an assistant, the work is completed in 5 days. Find the share to be received by the assistant

- (A) 500
- (B) 800
- (C) 300
- (D) 600

Ans: C

Solution: It is given A alone does the work in 8 days for ₹800.

So, per day he gets = $800/8 = ₹100$

Now, when the assistant joined, the work finished in 5 days.

Thus, the money A will receive = $₹100 \times 5 = ₹500$

The assistant will receive the remaining amount = $₹800 - ₹300 = ₹500$

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Q.11) A working twice as fast as B. If B can complete a work in 12 days independently, the number of days in which A and B can together finish the work is

- (A) 4 days
- (B) 8 days
- (C) 6 days
- (D) 18 days

Ans: A

Solution: Ratio of rates of working of A and B = 2 : 1. So, ratio of times taken = 1 : 2.

B's 1 day's work = $1/12$, So, A's one day's work = $1/6$ (2 times the work of B)

(A+B)'s one day's work = $1/6 + 1/12 = 3/12 = 1/4$

So, A and B together can finish the work in 4 days.

Q.12) A can do a piece of work in 7 days of 9 hours each and B can do it in 6 days of 7 hours each. How long will they take to do it, working together $42/5$ hours a day?

- (A) 41 days
- (B) 3 days
- (C) 5 days
- (D) $9/2$ days

Ans: B

Solution: A can complete the work in $(7 \times 9) = 63$ hours. B can complete the work in $(6 \times 7) = 42$ hours.

A's 1 hour's work = $(1/63)$ and B's 1 hour's work = $(1/42)$

(A + B)'s 1 hour's work = $(1/63) + (1/42) = (5/126)$ So, Both will finish the work in $(126/5)$ hrs.

Number of days. of $(42/5)$ hrs each = $(126 \times 5) / (5 \times 42) = 3$ days.

Q.13) A can do a certain Job in 12 days B is 60% more efficient than A. How many days B alone take to do the same job?

- (A) 7 days
- (B) $15/2$ days
- (C) 8 days
- (D) 6 days

Ans: B

Solution: A's 1 days' work = $1/12$

\therefore B's 1 days' work = $1.6/12 = 16/120 = 2/15$

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∴ B shall complete the work in $15/2$ days.

Q.14) Ram can do a work in 15 days. Rahim is 50% more efficient than Ram. The number of days, Rahim will take to do the same piece of work is

- (A) $12/2$
- (B) 12
- (C) 10
- (D) 14

Ans: C

Solution: ∴ Ram's 1 day work = $1/15$ part,

∴ Rahim's 1 day work = $1/15 + (1/15 \times 50)/100 = 1/15 + 1/30 = 1/10$ part

∴ Rahim's can do 1 part work in $1 \div 1/10$ days. = $(1 \times 10) \div 1 = 10$ days.

Q.15) A alone can do a certain job in 25 days which B alone can do in 20 days. A started the work and was joined by B after 10 days. The work lasted for:

- (A) $25/2$ days
- (B) $128/9$ days
- (C) 15 days
- (D) $20/3$ days

Ans: D

Solution: Work done by A in 10 days = $(1/25) \times 10 = 2/5$

Remaining work = $1 - (2/5) = 3/5$

(A+B)'s 1 day work = $(1/25) + (1/20) = 9/100$

$9/100$ work is done by them in 1 day.

Hence $3/5$ work will be done by them in $(3/5) \times (100/9) = 20/3$ days.

Q.16) Deepa and Arun can do a piece of work in 20 days and 30 days respectively. They work together and Deepa leaves 5 days before the work is finished. Arun finished the remaining work alone. In how many days is the total work finished?

- (A) 22.5 days
- (B) 12 days
- (C) 18 days
- (D) 20 days

Ans: A

Solution: Deepa = 20 days, Arun = 30 days

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Take LCM for 20 and 30= 60 units (total work)

Deepa=3 units per day, Arun=2 units per day

If two persons one day work= 3 + 2 = 5 units

Deepa and arun's 5days work = 5*5 = 25 units

Remaining work completed by arun = 35/2 = 17.5 days

So, total work is completed by = 17.5 + 5 = 22.5 days

Q.17) A and B can together finish a work in 30 days. They worked for it for 20 days and then B left. If the remaining work was done by A alone in 20 more days, A alone can finish the total work in

- (A) 18 days
(C) 54 days
(B) 50 days
(D) 60 days

Ans: D

Solution: A+B's 20 day's work= $(1/30) \times 20 = 2/3$

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

Now, 1/3rd. work is done by A in 20 days.

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

Q.18) Two men A and B can do a work alone in 8 days and 20 days respectively, they did work together for 4 days. Find the remaining portion of work to be completed?

- (A) 7/10
(B) 3/10
(C) 10/7
(D) 10/3

Ans: B

Solution: A can do work alone = 8 days, B can do work alone = 20 days,

Total work = LCM of (8,20) = 40 units

A's one day work = 5units, B's one day work = 2units

A and B's 4 days work= $4 \times 7 = 28$ units

Remaining portion of work = 12units, $(12/40 = 3/10)$

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Q.19) Two persons A and B are engaged in a work. A can do a piece of work in 12 days and B can do the same work in 20 days. They work together for 3 days and then A goes away. In how many days will B finish the work?

- (A) 12
- (B) 10
- (C) 9
- (D) 17

Ans: A

Solution: Work done by A in 1 day = $1/12$, Work done by B in 1 day = $1/20$

Work done by A and B together in 1 day = $(1/12) + (1/20) = 2/15$

Work done by A and B together in 3 days = $(2/15) \times 3 = 2/5$

Remaining Work = $1 - (2/5) = 3/5$

Number of days taken by B to finish the remaining work = $20 \times (3/5) = 12$ days.

Q.20) A can do a piece of work in 80 days. He works at it for 10 days and then B alone finishes the remaining work in 42 days. In how much time will A and B working together finish the work?

- (A) 28 days
- (B) 30 days
- (C) 29 days
- (D) 31 days

Ans: B

Solution: A's one day work = $(1/80)$, A's 10 days work = $(1/80) \times 10 = 1/8$

Remaining work = $1 - (1/8) = 7/8$

B completes work = $42 \times (8/7) = 48$ days, B's one day work = $1/48$

(A+B)'s one days work = $(1/80) + (1/48) = 8/240 = 1/30$

Q.21) Sita and Geetha can do a job in 15 days and 10 days respectively. They began to work together but Sita leaves after some days and Geetha finishes remaining job in 5 days. After how many days did Sita leave?

- (A) 5
- (B) 6
- (C) 8
- (D) 3

Ans: D

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Solution: Sita's job in one day = $1/15$, Geeta's job in one day = $1/10$

Let Sita worked for x days, work by Sita = $x/15$

Geeta worked for $x+5$ days, her work = $(x+5)/10$

So total work = $x/15 + (x+5)/10 = 1$

Multiplying by 30 we get

$$(30x/15) + 3(x+5) = 30$$

$$2x + 3x + 15 = 30$$

$$5x = 15 \Rightarrow x = 3$$

Q.22) A and B can do a piece of work in 12 days. B and C in 15 days, C and A in 20 days.

In how many days will they finish it together and separately?

(A) Together = 10 days Separately A = 30, B = 20, C = 60

(B) Together = 15 days Separately A = 35, B = 25, C = 65

(C) Together = 20 days Separately A = 40, B = 30, C = 70

(D) Together = 25 days Separately A = 45, B = 35, C = 75

Ans: A

Solution: $A+B$ (1 day's) = $1/12$ work, $B+C$ (1 day's) = $1/15$ work, $A+C$ (1 day's) = $1/20$ work

$$2(A+B+C) = (1/12) + (1/15) + (1/20) = (5+4+3)/60 = 12/60 = 1/5 \text{ work}$$

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

Q.23) A and B can do a work in 12 days, B and C in 15 days, C and A in 20 days. In how many days will they finish it together?

(A) 11

(B) 10

(C) 8

(D) 12

Ans: B

Solution: $(A + B)$'s one day's work = $1/12$, $(B + C)$'s one day's work = $1/15$, $(C + A)$'s one day's work = $1/20$

$$(A + B + C)'s \text{ one days' work} = (1/12) + (1/15) + (1/20)$$

$$(5 + 4 + 3)/60 = 12/60 = 1/5$$

$$(A + B + C)'s \text{ one days' work} = 1/10$$

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Q.24) A, B and C together can finish a piece of work in 4 days. A alone can do in 9 days and B alone in 18 days. How many days will be taken by C to do it alone?

- (A) days
- (B) 12 days
- (C) 9 days
- (D) 18 days

Ans: B

Solution: Let's time taken by C alone to complete the work in x days $\therefore 1/4 = (1/9) + (1/18) + (1/x)$

$$1/x = (1/4) - (1/9) - (1/18) \Rightarrow 1/x = 1/12$$

Q.25) Three men A, B and C can complete a job in 8, 12 and 16 days respectively. A and B work together for 3 days then B leaves and C joins. In how many days can A and C finish the work?

- (A) 1
- (B) 2
- (C) 4
- (D) 5

Ans: B

Solution: (A + B + C)'s one day work = $1/8 + 1/12 + 1/16 = 13/48$

$$(A + B)'s \text{ one day work} = 1/8 + 1/12 = 5/24$$

$$(A + B)' \text{ three days work} = (5 \times 3)/24 = 15/24$$

$$(A + C)'s \text{ one day work} = 1/8 + 1/16 = 3/16$$

$3/16$ work completed in 1 day, then 1 work completed in $16/3$

$9/24$ work completed in $16/3 \times 9/24 = 2$ days.

Q.26) A, B and C can do a piece of work in 36, 54 and 72 days respectively. They started the work but A left 8 days before the completion of work while B left 12 days before the completion. The number of days for which C worked.

- (A) 24
- (B) 28
- (C) 26
- (D) 30

Ans: A

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Solution: Efficiency of A = $1/36$, Efficiency of B = $1/72$, Efficiency of C = $1/54$

Suppose work is completed in d days.

Work done by A = $(d - 8)/36$, Work done by B = $d/72$, Work done by C = $(d - 12)/54$

Total work done by A, B and C = $(d - 8)/36 + d/72 + (d - 12)/54$

$$(6d - 48 + 3d + 4d - 48)/216 = 1$$

$$13d = 216 + 96 = 312, d = 24 \text{ days}$$

Q.27) If 12 men and 16 boys can do a piece of work in 5 days. 13 men and 24 boys can do it in 4 days. The ratio of the daily work done by a man to that of a boy is

(A) 2:1

(B) 3:1

(C) 3:2

(D) 5:4

Ans: A

Solution: $(12 \text{ men} + 16 \text{ Boys}) \times 5 = (13 \text{ men} + 24 \text{ Boys}) \times 4$

$$60 \text{ men} + 80 \text{ Boys} = 52 \text{ men} + 96 \text{ boys}$$

$$8 \text{ men} = 16 \text{ boys}$$

$$\text{men} = 2 \text{ boys}$$

$$\text{man: boy} = 2:1$$

Q.28) Eight men and twelve boys can finish a piece of work in 10 days while six men and eight boys can finish the same work in 14 days. Find the number of days taken by one man alone to complete the work and also one boy alone to complete the work

(A) Man - 280 days, boy - 140 days

(B) Man - 150 days, boy - 300 days

(B) Man - 200 days, boy - 140 days

(C) Man - 140 days, boy - 280 days

Ans: D

Solution: $10 (8m + 12b) = 14 (6m + 8b)$

$$2b = m$$

$$\text{Therefore, } 10 (8m + 6m) = 1$$

$$140m = 1 \text{ \& } 280b = 1$$

1 man needs 140 days

1 boy needs 280 days

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Q.29) If 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same work in 2 days, then what is the time taken by 15 men and 20 boys to complete the same type of work?

- (A) 4 days
- (B) 5 days
- (C) 6 days
- (D) 7 days

Ans: A

Solution: $10(6M + 8B) = 2(26M + 48B)$

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

Now substitute (1) in $15M + 20B$

$$15M + 10M = 25M$$

Now, $6M + 8B$ in 10 days

$$\text{Then } D(25M) = 100M \Rightarrow D = 4 \text{ days}$$

Q.30) 10 women can complete a work in 7 days and 10 children take 14 days to complete the same work. How many days will 5 women and 10 children take to complete the work.

- (A) 7
- (B) 3
- (C) 5
- (D) None of these

Ans: A

Solution: 1 woman 1 day's work = $1/70$, 1 child 1 day's work = $1/140$

$$(5 \text{ women} + 10 \text{ children})'s \text{ 1 day's work} = (5/70 + 10/140) = (1/14 + 1/14) = 1/7$$

\therefore The total work will be completed in 7 days.

Q.31) 20 women can do a work in 16 days. 16 men can do the same work in 15 days what is the ratio between the capacity of the men and the women?

- (A) 5:4
- (B) 4:5
- (C) 3:4
- (D) 4:3

Ans: D

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Solution: (20×16) woman can complete the work in 1 day

$$\therefore 1 \text{ woman's } 1 \text{ day's work} = 1/320$$

(16×15) men can complete the work in 1 day

$$\therefore 1 \text{ man's } 1 \text{ days's work} = 1/240$$

$$\text{So, required ratio} = 1/240:1/320 = 4:3$$

Q.32) A can do a piece of work in 10 days; B in 15 days. They work for 5 days. The rest of the work was finished by C in 2 days. If they get Rs.1500 for the whole work, the daily wages of B and C are

(A) Rs.150

(B) Rs. 250

(C) Rs. 225

(D) Rs. 300

Ans: C

Solution: A's 5 days work = 50% , B's 5 days work = 33.33%

$$\text{C's } 2 \text{ days work} = 16.66\% \quad [100 - (50 + 33.33)]$$

$$\text{Ratio of contribution of work of A, B and C} = 50 : 33.33 : 16.66 = 3 : 2 : 1$$

$$\text{A's total share} = \text{Rs. } 750, \text{ B's total share} = \text{Rs. } 500, \text{ C's total share} = \text{Rs. } 250$$

$$\text{B and C's daily wage (sum)} = (500/5) + (250/2) = 225$$

Q.33) Three men, four women and six children can complete a work in seven days. A woman does double the work a man does and child does half the work a man do. How many women can complete the work in 7 days?

(A) 7

(C) 12

(C) 8

(D) 9

Ans: A

Solution: Let 1 woman's 1 day's work = x

$$1 \text{ man's } 1 \text{ day's work} = x/2 \text{ and } 1 \text{ child's } 1 \text{ day's work} = x/4$$

$$(3x/2 + 4x + 6x/4) = 1/7$$

$$X = (1/7 \times 4/28) = 1/49$$

1 woman can complete the work in 49 days

$$\text{To complete the work in 7 days, number of women required} = (49/7) = 7$$

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Q.34) Three persons working 3 hours a day assemble 3 machines in three days. The number of machines assembled by 4 persons working 5 hours a day in 9 days is

- (A) 20
- (B) 81
- (C) 27
- (D) 180

Ans: A

Solution: $(p_1 \cdot h_1 \cdot d_1) / w_1 = (p_2 \cdot h_2 \cdot d_2) / w_2$

$$(3 \cdot 3 \cdot 3) / 3 = (4 \cdot 5 \cdot 9) / w_2$$

$$W_2 = 20$$

Q.35) Working hours of an office is morning 9:30 to evening 5:30. There will be a Lunch break between 12 noon to 1:15 p.m. If the office functioning 6 days in a week, what is the total working hours of the office during a week.

- (A) 39 hours 10 minutes
- (B) 36 hours
- (C) 47 hours 15 minutes
- (D) 38 hours

Ans: C

Solution: Total working hours = $(8 \text{ hrs} \cdot 60 \text{ min} \cdot 7 \text{ days}) - (75 \text{ min} \cdot 7 \text{ days}) = 47 \text{ hours } 15 \text{ minutes}$

Q.36) An employer pays Rs. 20 for each day a worker work and forfeits Rs. 3 for each day he is idle. At the end of 60 days, a worker gets Rs. 280. For how many days did the worker remain idle?

- (A) 30
- (B) 39
- (C) 35
- (D) 40

Ans: D

Solution: Let x be the number of days where employee is working and y be the number of days where employee is sitting idle.

$$\text{Total number of days} = 60$$

$$\therefore x + y = 60 \dots \dots \dots (1)$$

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He gets 20 rs for each working day and 3 Rs is deducted and total amount he get is 280 Rs

$$\therefore 20x - 3y = 280 \dots (2)$$

Multiplying equation 1 by 3

$$\text{Hence we get } 3x + 3y = 180 \dots (3)$$

Adding equation 1 and 3 we get

$$23x = 460$$

$$x = 20$$

Putting $x = 20$ in equation 1

$$\therefore y = 40$$

Q.37) The daily wage is increased by 15% and a person now gets Rs. 23 per day. What was his daily wage before the increase?

- (A) Rs. 10
- (B) Rs. 15
- (C) Rs. 20
- (D) Rs. 30

Ans: C

Solution: 115% \rightarrow 23

100% \rightarrow x by cross multiplying this we get $x = 20$

Q.38) There are 1000 soldiers in an army camp. There are enough provisions for them for 70 days. If 400 more soldiers join the camp, for how many days will the provisions last?

- (A) 40 days
- (B) 45 days
- (C) 50 days
- (D) 55 days

Ans: C

Solution: 1000 soldiers \rightarrow 70 days

1400 soldiers \rightarrow X days, By solving this we get $X = (1000/1400) \times 70 = 50$ days

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Q.39) 7 men can complete a work in 52 days. In how many days will 13 men finish the same work?

- (A) 26
- (B) 27
- (C) 28
- (D) 29

Ans:

Solution: 7men → 52 days

13men → x days, By solving this we get $x = (7/13) * 52 = 28$ days

Q.40) A book contains 144 pages. Each page contains 25 lines. How many pages will the book contain if every page has 24 lines?

- (A) 120
- (B) 150
- (C) 130
- (D) 140

Ans: B

Solution: 144 pages → 25 lines

X pages → 24 lines, By solving this $x = (25/24) * 144 = 150$ pages

Q.41) If the wages of 15 labourers 6 days are Rs. 7,200, find the wages of 23 labourers for 5 days

- (A) Rs. 6,200
- (B) Rs. 7,200
- (C) Rs. 8 200
- (D) Rs. 9,200

Ans: D

Solution: $(15 \text{ Labourers} * 6 \text{ days}) / 7200 = (23 \text{ laborers} * 5 \text{ days}) / x$

$X = (23 * 5 * 7200) / (15 * 6) = 9200$

MANIDHANAHEYAM FREE IAS ACADEMY – TNPSC GROUP – IV & VAO EXAM
UNIT – X – APTITUDE & MENTAL ABILITY

Q.42) Typing speed of Mr. Smith is 100 words per minute and that of Mrs. Smith is 80 words per minute. They got an offer of typing a book of 1000 pages. Mr. Smith decided to type 600 pages and asked Mrs. Smith to type the rest. If each page of book consists of 100 words, then the time taken by both working together to type the book is:

- (a) 900 minutes
- (b) 1000 minutes
- (c) 1200 minutes
- (d) 1100 minutes

Ans: D

Solution: Typing speed of Mr. Smith = 100 words per minute

Typing speed of Mrs. Smith = 80 words per minute.

Total number of pages = 1000 pages

Number of pages typed by Mr. Smith = 600 pages

Number of pages typed by Mrs. Smith = 400 pages

Now, according to the question,

Total words typed by Mr. Smith = 100×600 words

Total words typed by Mrs. Smith = 80×400 words

\therefore Time taken by Mr. Smith to type 100 words = 1 minute

\therefore Time taken by Mr. Smith to type 100×600 words = $(1/100) \times (100 \times 600)$

minutes = 600 minutes

Similarly,

\therefore Time taken by Mrs. Smith to type 80 words = 1 minute

\therefore Time taken by Mrs. Smith to type 80×400 words = $(1/80) \times (80 \times 400)$

minutes = 500 minutes

Total time taken by both working together to type 1000 pages = $600 + 500 = 1100$ minutes

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UNIT – X – APTITUDE & MENTAL ABILITY

Q.43) Tap A can fill a tank in 15 minutes and another tap B can fill it in 10 minutes. Both taps are opened to fill the empty tank. But after 4 minutes, a leak developed in the tank. The leak alone can empty the full tank in just 5 minutes. If both pipes were opened at 9 o'clock, then at what time will the tank be emptied?

- (a) 9: 20
- (b) 9: 30
- (c) 9: 25
- (d) 9: 40

Ans: A

Solution: Tap A can fill the tank in 15 minutes

Work done by tap A in 1 minute = $1/15$

Similarly,

Tap B can fill the tank in 10 minutes

Work done by tap B in 1 minute = $1/10$

Work done by tap A and B in 1 minute = $(1/15) + (1/10) = 1/6$

Work done by tap A and B in 4 minutes = $4/6 = 2/3$

Leak can empty the tank in 5 minutes

Work done by leak in 1 minute = $- 1/5$

Work done by both taps and leak in 1 minute = $(1/6) - (1/5) = - (1/30)$

Negative sign shows that after developing the leak the drain of water will start and the water filled by A and B in 4 minutes will be emptied.

Time taken by both taps and leak to empty the tank = $(2/3) / (1/30) = 20$ minutes

Hence required time = 9:00 + 20 minutes = 9: 20

Q.44) A can do 2/5th of the work in 8 days, while B can do 20% of the same work in 5 days. Starting with A, they work on alternate days. After 9 days, A left the work. In how many days was the work completed?

- (a) 14.75 days
- (b) 11.11 days
- (c) 23.75 days
- (d) 25 days

Ans: C

Solution: A can do 2/5th of the work in 8 days.

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So, A can complete that whole work in $8 \times (5/2)$ i.e., 20 days.

B can complete 20% of the work in 5 days.

So, B can complete that whole work in $5 \times (100\%/20\%)$ i.e., 25 days.

Let the total units of work be 100 (LCM of 20 and 25).

Efficiency of A = $100/20 = 5$ units/day

Efficiency of B = $100/25 = 4$ units/day

As they worked on alternate days, so till 9th day A will work for 5 days, and B will work for 4 days.

Total units of work completed till 9th day = $(5 \times 5 = 25 \text{ units}) + (4 \times 4 = 16 \text{ units}) = 25 + 16 = 41$ units.

Work left = $100 - 41 = 59$ units.

59 units will be completed by B alone.

Number of days taken by B to complete 59 units of work = $59/4 = 14.75$ days

Total number days taken to complete the work = $9 + 14.75 = 23.75$ days.

Q.45) A contractor has to complete a renovation work, for which he can hire labours from a pool of labours, each of whom have the same efficiency. At the start, he hires 5 labours who can complete the task in 9 days. On third day, he hires two more labours. What is the total number of days required to complete the work?

- (a) 18 days
- (b) 8 days
- (c) 7 days
- (d) 9 days

Ans: C

Solution: Let the rate of work of one labour be x units per day.

The renovation work will be completed in 9 days by 5 labours.

Hence, total work = $9 \times 5 \times x = 45x$

It is given that, for two days, five labours work.

Hence, the work done in first 2 days by five labours = $10x$

So, work left = $45x - 10x = 35x$

Work done per day when 7 labours will work = $7x$

So, number of days needed by 7 labours to complete the rest of the work = $35x/7x = 5$ days

So, total days required to complete the work = $2 + 5 = 7$ days

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Q.46) A contractor employed 100 workers to build a road in 50 days. After 20 days, 60 workers got infected with coronavirus and 20 workers left the work due to fear of virus. Find the total number of days required to complete the road if the contractor was not able to hire more workers and he had to continue the work with remaining workers.

- a) 170 days
- b) 130 days
- c) 100 days
- d) 180 days

Ans: A

Solution: Total work (in men-days) = men \times day = $100 \times 50 = 5000$ units

Work done in initial 20 days = $100 \times 20 = 2000$ units

Remaining work = $5000 - 2000 = 3000$ units

Remaining workers = $100 - (60 + 20) = 20$

Now, Days required by 20 workers to complete the remaining work = $3000/20 = 150$ days

Hence, total days required to complete the road = $150 + 20 = 170$ days.

Q.47) Kamesh, Ganesh and Brijesh charge Rs. 200, Rs. 150 and Rs. 180 per day respectively for their work. They work at a construction site, work done by them is in the ratio of 3:2:4 respectively. What will be the average labour cost for all three workers per day for the Contractor at the construction site?

- (a) Rs. 180
- (b) Rs. 177
- (c) Rs. 200
- (d) Rs. 155

Ans: A

Solution: Labour cost of Ramesh = Rs. 200

Labour cost of Ganesh = Rs. 150

Labour cost of Brijesh = Rs. 180

Ratio of the work of Ramesh, Ganesh and Brijesh = 3:2:4

So, let the work done by Ramesh in one day = $3x$ units

The work done by Ganesh in one day = $2x$ units

The work done by Brijesh in one day = $4x$ units

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∴ The average labour cost of all the three workers per day =

$$\frac{(200 \times 3x) + (150 \times 2x) + (180 \times 4x)}{3x + 2x + 4x}$$

$$= \frac{600x + 300x + 720x}{9x}$$

$$= \frac{1620x}{9x} = \text{Rs. } 180$$

So, the average labour cost of all the three workers per day is Rs 180.

Q.48) A can lay railway track between two given stations in 16 days and B can do the same job in 12 days. With help of C, they did the job in 4 days only. Then, C alone can do the job in:

- (A) 46/5 days
- (B) 47/5 days
- (C) 48/5 days
- (D) 46/5 days

Ans: C

Solution: (A+B+C)'s 1 day's work = 1/4

A's 1 day's work = 1/16;

B's 1 day's work = 1/12;

∴ C's 1 day's work = 1/4 - (1/16 + 1/12) = (1/4 - 7/48) = 5/48

So, C alone can do the work in 48/5 days

Q.49) A machine P can print one lakh books in 8 hours, machine Q can print the same number of books in 10 hours while machine R can print them in 12 hours. All the machines are started at 9 A.M. while machine P is closed at 11 A.M. and the remaining two machines complete work. Approximately at what time will the work (to print one lakh books) be finished?

- (A) 11:30 A.M.
- (B) 12 noon
- (C) 12:30 P.M.
- (D) 1:00 P.M.

Ans: D

Solution: The efficiency of P is 1/8, The efficiency of Q is 1/10, The efficiency R is 1/12

Work done by P + Q + R in one hour = 1/8 + 1/10 + 1/12 = (15 + 12 + 10) / 120 = 37/120

P, Q and R work for two hours 9 A.M to 11 A.M

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$$37/120 \times 2 = 37/60$$

$$\text{Remaining work} = 1 - 37/60 = 23/60$$

$$\text{Work done by Q and R in an hour} = 1/10 + 1/12 = 11/60$$

$$\text{Now time taken to complete the remaining work} = (23/60) / (11/60) = 23/11$$

$\approx 2 \text{ hours}$

So add 2 hours in 11 A.M we get 1p.m

Q.50) Ravi and Kumar are working on an assignment. Ravi takes 6 hours to type 32 pages on a computer, while Kumar 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?

- (A) 7 hours 30 minutes
- (B) 8 hours
- (C) 8 hours 15 minutes
- (D) 8 hours 25 minutes

Ans: C

Solution: Number of pages typed Ravi in 1 hour $= 32/6 = 16/3$

Number of pages typed by Kumar in 1 hour $= 40/5 = 8$.

Number of pages typed by both in 1 hour $= (16/3) + 8 = 40/3$.

\therefore Time taken by both to type 110 pages $= 110 \times (3/40)$ hours
 $= 33/4$ hours (or) 8 hours 15 minutes.