TIME AND WORK

Dear students hopefully you have done well in SBI clerk pre examination now its turn of SBI PO pre exam.

This week our topic is Time and Work so lets start..

Work-Total or part of any task assigned is called work.

Time-Duration required to complete the assigned work is called time.

Note- If any person alone completes any work then consumed time is called alone time.

Efficiency- work done per unit time is called efficiency.

Or in other words work done per day is called efficiency.

No. of days required to complete a work-Remaining work/ one day work

Time and efficiency both are inversely proportional it means if A is more efficient than B then he will

Take less time as compare to B.

Important points:

(1) If A can do a piece of work in X days, then A's one day's work =1/Xth part of whole work.

(2) If A's one day's work =1/Xth part of whole work, then A can finish the work in X days.

(3) If A can do a piece of work in X days and B can do it in Y days then A and B working together will do the same work in $\frac{XY}{X+Y}$ days.

(4) If A, B and C can do a work in X, Y and Z days respectively then all of them working together can finish work in

$\frac{XYZ}{XY+YZ+XZ}$ days.

MDH Formula

ith the help of MDH formula many problems can be solved easily.

Here M= No of persons

D= No of days required/work done

H= Working hour

W= Total work done.

If no of men increases days will be decreased, hence

$$M \propto \frac{1}{D}$$

If no of men increases working hour will be decreased, hence

$$M \propto \frac{1}{H}$$

If no of men increases work done by them will also increase, hence

$$M \propto W$$

Combining all these three we can easily find

$$\frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$$

ALTERNATE WORKING

If two or more than two persons work on any task in a manner that if one person work on a particular day and next day he takes rest and other person work and again next day first person work and second person takes rest and so on then this is called alternate day working.

Note- In alternate day working questions who start the work become significant as we have to know last day when work is about to finish who was working.

Work Done in 1 Day = 1/n

Number of days required to complete work	Work/Day	Efficiency (%)
N	1/n	100/n
1	1	100
2	1/2	50
3	1/3	33.33
4	1/4	25
5	1/5	20
6	1/6	16.66
7	1/7	14.28
8	1/8	12.5
9	1/9	11.11
10	1/10	10
11	1/11	9.09
12	1/12	8.25
13	1/13	7.69
14	1/14	7.14
15	1/15	6.66

Question.

A take 5 days to complete a job and B takes 10 days to complete the same job. In how much time they will complete the job together?

Solution

A's efficiency = 20%, B's efficiency = 10%. If they work together they can do 30% of the job in a day. To complete the job they need 3.33 days.

Question.

A is twice as efficient as B and can complete a job 30 days before B. In how much they can complete the job together?

Solution

Let efficiency percentage as x

$\Rightarrow$ A's efficiency = 2x and B's efficiency = x

$\Rightarrow$ A is twice efficient and can complete the job 30 days before B. So,

$\Rightarrow$ A can complete the job in 30 days and B can complete the job in 60 days

$\Rightarrow$ A's efficiency = 1/30 = 3.33%

$\Rightarrow$ B's efficiency = 1/60 = 1.66%

$\Rightarrow$ Both can do 5% (3.33% + 1.66%) of the job in 1 day. So the can complete the whole job in 20 days (100/5)

Question.

A tank can be filled in 20 minutes. There is a leakage which can empty it in 60 minutes. In how many minutes tank can be filled?

Solution

Method 1

$\Rightarrow$ Efficiency of filling pipe = 20 minutes = 1/3 hour = 300%

$\Rightarrow$ Efficiency of leakage = 60 minutes = 100%

We need to deduct efficiency of leakage so final efficiency is 200%. We are taking 100% = 1 Hour as a base so the answer is 30 minutes.

Method 2

$\Rightarrow$ Efficiency of filling pipe = 100/20 = 5%

$\Rightarrow$ Efficiency of leakage pipe = 100/60 = 1.66%

$\Rightarrow$ Net filling efficiency = 3.33%

So tank can be filled in = 100/3.33% = 30 minutes

You can change the base to minutes or even seconds.

Question.

4 men and 6 women working together can complete the work within 10 days. 3 men and 7 women working together will complete the same work within 8 days. In how many days 10 women will complete this work?

Solution

Let number of men =x, number of women = y

$\Rightarrow$ Efficiency of 4 men and 6 women

= 100/10 = 10% $\Rightarrow$ so, 4x+6y = 10

Above equation means 4 men and 6 women can do 10% of the job in one day.

$\Rightarrow$ Efficiency of 3 men and 7 women

= 100/8 = 12.5%

so, 3x+7y = 12.5

By solving both equations we get, x

= -0.5 and y = 2

$\Rightarrow$ Efficiency of 1 woman(y) = 2% per day

$\Rightarrow$ Efficiency of 10 women per day = 20%

So 10 women can complete the job in 100/20 = 5 days

Question.

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

Solution

$\Rightarrow$ Efficiency of A and B = 1/20 per day = 5% per day
_____1

$\Rightarrow$ Efficiency of B and C = 1/30 per day = 3.33% per day_____2

$\Rightarrow$ Efficiency of C and A = 1/30 per day = 3.33% per day_____3

Taking equation 2 and 3 together

$\Rightarrow$ B + C = 3.33% and C + A = 3.33%

$\Rightarrow$ C and 3.33% will be removed. Hence A = B

$\Rightarrow$ Efficiency of A = B = 5%/2 = 2.5% = 1/40

$\Rightarrow$ Efficiency of C = 3.33% - 2.5% = 0.833% = 1/120

$\Rightarrow$ A can do the job in 40 days and C can do the job in 120 days he they work alone.

$\Rightarrow$ Ratio of number of days in which A and C can complete the job 1:3.

Question.

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

(1) 15   (2) 10

(3) 8   (4) 5

(5) None of these

Solution :

200 workers do rest of the work in 40 – 35 = 5 days

$\therefore$ 100 workers can do the remaining work in $\dfrac{5 \times 200}{100}$ = days

$\therefore$ If additional workers were not employed, the work would have lasted 10 – 5 = 5 days be his schedule time.

Question.

Ram, Shyam and Manmohan are employed to do a piece of work for Rs. 1026. Ram and Manmohan are supposed to finish 14/27 of the work together. Amount that should be paid to Shyam is how much?

(1) Rs. 504   (2) Rs. 266
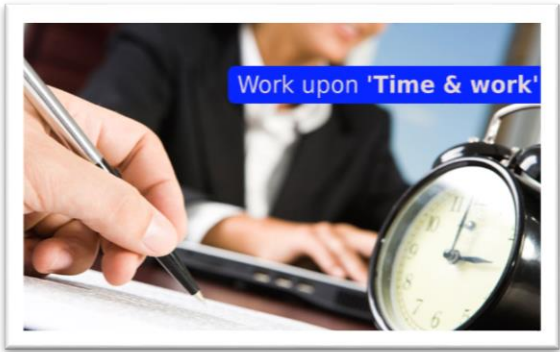
(3) Rs. 532   (4) Rs. 494

(5) None of these

Solution :

Since Ram and Manmohan are supposed to finish 14/27 of the work together,

Hence, part of work done by Shyam = $1 - \dfrac{14}{27}$ = 13/27

We know that in a group task, amount paid is in the ratio of work done.

Hence, amount paid to Shyam = $\dfrac{13}{27} \times 1026$ = Rs 494

Work upon 'Time & work'

Question.

A & B together complete a job in 5 days. If A works twice fast & B works with 1/3 of its original efficiency then the work is completed in 3 days. A can complete the work.

(1) 25/4   (2) 26/4

(3) 25/3   (4) 26/3

(5) None of these

Solution

Let the efficiency of A and B be a and b

So as per question

5(a+b)=1

5a+5b=1-----------(II)

when A works with double efficiency and B works with 1/3rd then

3(2a+b/3)=1

6a+b=1----------(II)

on solving we get equation I and II we get a= 4/25

so A will complete the whole work in 25/4 days

Question

P does a work in 15 days, and Q does the same work in 16 days. P and Q started the work, and after 6 days Q left. P completed the remaining work. Find the total number of days after which the work will be completed?

(1) 7 days   (2) 8 days

(3) 9 days   (4) $9\dfrac{3}{8}$ days

(5) None of these

Solution

Work done by P in 1 day = $\dfrac{1}{5}$

Work done by Q in 1 day = $\dfrac{1}{6}$

Acc. to question,

$6\left(\dfrac{1}{15} + \dfrac{1}{16}\right) + X\left(\dfrac{1}{15}\right) = 1$

$x = \dfrac{27}{8}$

So Total days $= 6 + \dfrac{27}{8}$

$= 9\dfrac{3}{8} \, days$

P and Q work for 6 days.

total work done by Q = 6/16

remaining work = 10/16

this work is done by P alone = (10/16) × 15 = 9(3/8)

Question.

Akshay and Hrithik can do a piece of work in 45 days and 40 days respectively. They began to do the work together but Akshay leaves after some days and then Hrithik completed the remaining work in 23 days. The number of days after which Akshay left the work was:

(1) 17 days   (2) 14 days

(3) 9 days   (4) 18 days

(5) None of these

Solution

(Akshay + Hrithik)'s 1 day's work

= (1/45)+(1/40)= 17/360

Work done by Hrithik in 23 days= Remaining work = 23 ×(1/40)

= 23/40

Now, work (17/40) part was done by both in

=[(17/40)/(17/360)]= 9 days

hence, Akshay left after 9 days.

Question.

Shekher can do a piece of work in 45 days, but Sandeep can do the same work in 5 days less than Shekher, when working alone. Shekher and Sandeep both started the work together but Sandeep left after some days and Shekher finished the remaining work in 56 days with half of his efficiency but he did the work with Sandeep with his full efficiency. For how many days they had worked together.

(1) 6   (2) 8

(3) 9   (4) 12

(5) None of these

Solution
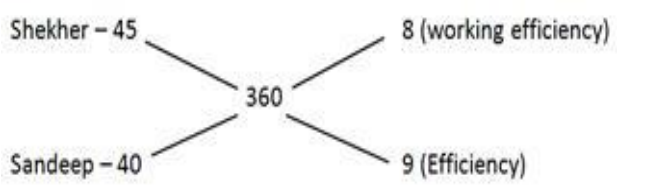
Total work to do done = 360 unit

Shekher work for 56 day with half efficiency then work done

$$= 56 \times \frac{8}{2} = 224$$

Remaining work = 360 – 224 = 136

This work is done by both Shekher and Sandeep together then

$$\text{time taken} = \frac{136}{8+9} = 8$$

Shekher and Sandeep work together for 8 days.

Question.

16 men are able to complete a work in 12 days working 14 h a day. How long will 28 men working 12 h a day, take to complete the work?

(1) 5 days   (2) 6 days

(3) 8 days   (4) 4 days

(5) None of these

Solution

The correct chain rule is;

16 × 12 × 14 = 28 × 12 × x

x = 8 days

Hence Option C is correct

Question.

B is 50% more efficient than A and A can alone do a work in 33 days. Then find thenumber of days, in which A and B, working together can finish the job.

(1) 11   (2) 13.2

(3) 20   (4) 21

(5) None of these

Solution

Let B can do a work in x days.

Then, A can do a work in

$$x + \frac{50}{100} \times x = x + \frac{x}{2} = \frac{3x}{2} \, days$$

Therefore,

$$\frac{3x}{2} = 33 \Rightarrow x = \frac{66}{3} = 22 \, days$$

A's 1 day work $= \dfrac{1}{33}$

B's 1 day work $= \dfrac{1}{22}$

(A +B)'s 1 day work together $= \dfrac{1}{33} + \dfrac{1}{22} = \dfrac{5}{66}$

Thus, A+B can do a work together in 66/5= 13.2

Hence, option B is correct.

Question.

Six men can complete a piece of work in 32 hours. In how many hours will 16 men complete the same piece of work?

(1) 18   (2) 16

(3) 12   (4) 24

(5) None of these

Solution

6×32=16×No. of hours

No. of hours= 6×32÷16= 12 hours

Hence option C is correct

Question.

Vikas gets ₹350 for every day that he works. If he earns ₹9800 in a month of 31 days, for how many days did he work ?

(1) 25 days   (2) 30 days

(3) 24 days   (4) 28 days

(5) None of these

Solution

The total number of days Vikas worked = $\dfrac{\text{Total earning}}{\text{Per day earning}}$

$= \dfrac{9800}{350} = 28\,\text{days}$

Hence, option (D) is correct.

Question.

Ram and Shyam together can do a work in 8 days. Both of them began to work. After 3 days Ram fell ill. Shyam completed the remaining work in 15 days. In how many days can Ram complete the whole work?

(1) 17   (2) 12

(3) 15   (4) 13

(5) None of these

Solution

Work of Ram and Shyam for

1 day = $\dfrac{1}{8}$

∴ Work of Ram and Shyam for 3 days $\dfrac{3}{8}$

∴ Remaining work = 1 - $\dfrac{3}{8} = \dfrac{5}{8}$

∵ $\dfrac{5}{8}$ work is done by Shyam in 15 days

∴ 1 work is done by Shyam

$= 15 \times \dfrac{8}{5} = 24$ days

∴ work of Shyam for 1 day = $\dfrac{1}{24}$

∴ work of Ram for 1 day

$= \dfrac{1}{8} - \dfrac{1}{24} = \dfrac{1}{12}$

Hence Ram alone will complete the work in 12 days.

Question.

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

(1) 6 months   (2) 4 months

(3) 5 months   (4) 8 months

(5) None of these

Solution

10 men = 20 women = 40 children can complete the work in 7 months

10 men = 20 women

therefore, women = men/2

10 men = 40 children

therefore, children = men/4

5 men + 5 women + 5 children = 5 men + 5(men/2) + 5(men/4)

= 35/4 men.

10 men can complete the work in 7 months

Therefore 35/4 men will complete the work in (7 × 10)/(35/4)

= 8 months.

Half of the work will be completed in 8/2 = 4 months.

Question.

If 5 men or 7 women can earn Rs. 5,250 per day, how much would 7 men and 13 women earn per day?

(1) Rs. 11,600   (2) Rs. 11,700

(3) Rs. 16,100   (4) Rs. 17,100

(5) None of these

Solution

5 men = 7 women

Therefore 1 men = 7/5 women

Similarly 7 men = 7/5 × 7 = 49/5 women

Therefore 7 men + 13 women = 49/5 + 13 = 114/5

Now 7 women earn = Rs. 5250

1 women = Rs. (5250/7)

Thus 114/5 women will earn

$$= \frac{5250}{7} \times \frac{11}{5} = \text{Rs. } 17,100$$

Question.

A can do a piece of work in 6 days. B is 25% more efficient A. How long would B alone take to finish this work?

(1) $4\frac{4}{5}$ days   (2) $3\frac{3}{4}$ days

(3) $5\frac{1}{4}$ days   (4) $2\frac{2}{3}$ days

(5) None of these

Solution :

A - 6

B is 25% more efficient than A

B does the work in x days

x × 125% = 6

x = 4 (4/5)

Question.

A can cultivate $\frac{2}{5}$ th of a land in 6 days and B can cultivate $\frac{1}{3}$ of the same land in 10 days. Working together A and B can cultivate $\frac{4}{5}$ th of the land in:

(1) 4 days   (2) 5 days

(3) 8 days   (5) 10 days

(5) None of these

Solution

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

$$= \frac{1}{3 \times 10} = \frac{1}{30}$$

∴ The part of field cultivated by A and B together

$$= \frac{1}{15} + \frac{1}{30} = \frac{3}{30} = \frac{1}{10}$$

$\frac{4}{5}$ part of field cultivated by A and B together in

$$= \frac{\frac{4}{5}}{\frac{1}{10}} \, days = \frac{4 \times 10}{5} = 8 \; days$$

Question.

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

(1) 155   (2) 165

(3) 160   (4) 150

(5) None of these

Solution :

work done by A = 8/16=1/2

work done by B = 8/24=1/3

work done by C = 1-[1/2+1/3]

1-5/6=1/6

C's share = 1/6 of 960=160

Question.

A and B can do a work in 12 days, B and C can do the same work in 15 days, C and A can do the same work in 20 days. The time taken by A, B and C to do the same work is

(1) 5 days   (2) 10 days

(3) 15 days   (4) 20 days

(5) None of these

Solution

Oops! Wrong answer!

(A + B) can do a work in 12 days

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

(B + C) can do a work in 15 days

∴ (B + C)'s 1 day work = $\frac{1}{15}$ …(2)

(C + A) can do a work in 20 days

∴ (C + A)'s 1 day work = $\frac{1}{20}$ …(3)

If A, B and C do a work together.

∴ 2(A + B + C)'s 1 day work = $\frac{1}{12} + \frac{1}{15} + \frac{1}{20} = \frac{12}{60}$

∴ (A + B + C)'s 1 day work = $\frac{12}{60} \times \frac{1}{2} = \frac{1}{10}$

Thus, A, B and C do a work together in 10 days.

Hence, option B is correct.

Question.

B and C can complete a piece of work in 12 days. C and A can do it in 8 days. A, B and C together can complete it in 6 days. Find the time taken by A and B to complete the work.

(1) 4 days   (2) 6 days

(3) 8 days   (4) 10 days

(5) None of these

Solution

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

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

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

$\therefore$ C's 1 day's work = (i) + (ii) - (iii)

$= \dfrac{1}{12} + \dfrac{1}{8} - \dfrac{1}{6}$

$= \dfrac{2 + 3 - 4}{24} = \dfrac{1}{24}$

$\therefore$ $(A + B)$'s 1 day's work $= \dfrac{1}{6} - \dfrac{1}{24}$

$= \dfrac{4 - 1}{24} = \dfrac{3}{24} = \dfrac{1}{8}$

$\therefore$ Required time = 8 days

Question. 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?

(1) 20 days   (2) 21 days

(3) 21.4 days   (4) 25 days

(5) None of these

Solution

Oops! Wrong answer!

A is 50% efficient than B hence A= 150 % of B

A/B = 3/2

If A does 3 unit of work B does 2 unit of work

Work done by A + B in 15 days = 5 × 15 = 75

Work done by A alone = 75/3 = 25 days

Question.

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

(1) 10 days   (2) 12 days

(3) 15 days   (4) 16 days

(5) None of these

Solution

$(B+C)$'s two days' work $= 2 \times \dfrac{5}{60} = \dfrac{1}{6}$ work

Remaining work = 1 – 1/6 = 5/6 work

Thus; A's remaining job completed in 5/6 × 18 = 15 days

Question.

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

(1) 3 hours   (2) 2 hours

(3) 2.5 hours   (4) 3.25 hours

(5) None of these

Solution :

$(A + B)$'s 1 hour's work $= \dfrac{2}{9}$ …(i)

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

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

Adding all the three equations, we have,

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

$= \dfrac{2}{9} + \dfrac{1}{3} + \dfrac{4}{9} = \dfrac{2 + 3 + 4}{9} = 1$

$\therefore$ A, B and C together will complete the work in 2 hours.

Question. A can do a piece of work in 18 days. B in 27 days and C in 36 days. They start working together but only C work till the completion. A leaves 7 days and B leaves 8 days before the completion of work. The whole work was completed in

(1) 12 days   (2) 16 days

(3) 14 days   (4) 11 days

(5) None of these

Let the work be completed in x days

(x-7) days of A + (x-8) days of B + x days of C = 1

$\Rightarrow \dfrac{x - 7}{18} + \dfrac{x - 8}{27} + \dfrac{x}{36} = 1$

13x – 74 = 108

x = 182/13 = 14 days

Question.

A and B together can finish a work in 9 days. A alone can finish the same work in 12 days. In how many days will B alone finish the work?

(1) 24 days   (2) 28 days

(3) 32 days   (4) 36 days

(5) None of these

Solution :

(A + B) can finish a work in 9 days.

∴ (A + B)'s 1 day work = 1/9

A alone can finish the same work in 12 days.

∴ A's 1 day work = 1/12

∴ B's 1 day work = $\dfrac{1}{9} - \dfrac{1}{12} = \dfrac{1}{36}$

Therefore, B will complete the work in 36 days.

Question.

A, B and C are employed to do a piece of work for Rs. 529. A and B together are supposed to do 19/23 of the work and B and C together 8/23 of the work. What amount should A be paid?

(1) Rs. 315   (2) Rs. 320

(3) Rs. 345   (4) Rs. 350

(5) None of these

Solution

Work done by A = (1 - 8/23) = 15/23

A : (B+C) =(15/23 : 8/23) = 15 : 8

So, A's share = Rs. (15/23 x 529) = Rs. 345

Question.

Raju can copy 40 pages in 10 minutes. While Shyam and Raju together can copy 250 pages in 25 minutes. In how many minutes can Shyam copy 36 pages?

(1) 10   (2) 4

(3) 8   (4) 6

(5) None of these

Solution

Raju can copy 4 pages in 1 minute. While Shyam and raju together can copy 10 pages in a minutes. Hence Shyam alone can copy 6 pages in a minute. Therefore he can copy 36 pages in 6 minutes

Question. A, B and C can complete a work individually in 20 days, 16 days and 24 days respectively. They start to work together and after working 5 days, B left the workplace. In how many days will A and C finish the rest of the work?

(1) $2\dfrac{1}{2}$ days   (2) $1\dfrac{1}{4}$ days

(3) $3\dfrac{1}{2}$ days   (4) $2\dfrac{1}{3}$ days

(5) None of these

Solution

A, B and C can complete a work individually in 20 days, 16 days and 24 days respectively.

So, the part of work done by three of them in 1 day

= (1/20) + (1/16) + (1/24) = 37/240

They start to work together and after working 5 days, B left the workplace.

Then, the part of work done by three of them in 5 days

= (37/240) × 5 = 37/48

So, the remaining work = 1 – (37/48)

= 11/48

The part of work done by A and C in 1 day

= (1/20) + (1/24) = 11/120

∴ A and C together will finish the rest of the work in

= (120/11) × (11/48) = $2\dfrac{1}{2}$ days.

Question.

Ganesh, Ram and Sohan together can complete a work in 16 days. If Ganesh and Ram together can complete the same work in 24 days. The number of days Sohan alone takes, to finish the work is

(1) 40   (2) 48

(3) 32   (4) 30

(5) None of these

Solution

Ganesh, Ram and Sohan one day work =1/16

Ganesh and Ram one day work = 1/24

The number of days Sohan alone takes, to finish the work is =

$$\dfrac{1}{\dfrac{1}{16} - \dfrac{1}{24}}$$

$$= \dfrac{1}{\dfrac{1}{48}} = 48 \text{ days}$$

Question.

A group of worker was put on a job. From the second day onwards, one worker was withdrawn each day. The job was finished when the last worker was withdrawn. Had no worker been withdrawn at any stage, the group would have finished the job in 55% of the time. How many worker were there in the group.

(1) 50   (2) 40

(3) 45   (4) 10

(5) None of these

Solution

Let them be n worker

$$\dfrac{n(n+1)}{2} = n \times 55\% \text{ of } n$$

$$\dfrac{n(n+1)}{2} = \dfrac{n \times 55}{100} \times n$$

we get n = 10

Question.

Ram and Hari can cut 12 kgs nuts in 2 days. After 5 days, Hari left the work. Ram took 8 more days to cut the rest of the nuts. If total of 58 kgs of nuts were cut, the time taken by Hari to cut 10 kg of nuts is

(1) 1 day   (2) 2 days

(3) 3 days   (4) 4 days

(5) None of these

Solution

1 day's work by Ram and Hari = $\dfrac{12}{2} = 6$ kg

Work done in 5 days = 6 × 5 = 30 kg

Remaining nuts = 58 – 30 = 28kg

Ram took 8 days to cut 28 kg nuts

∴ 1day's work by Ram = 28/8 = 7/2 kg

∴ efficiency of Hari = $6 - \dfrac{7}{2} = \dfrac{5}{2}$

Time taken by Hari to cut 10kg nuts = $\dfrac{10}{\dfrac{5}{2}}$ = 4 days

Question.

If A's speed of doing a certain job is 50% of C and B's speed of doing the same job is 50% of A, then how much time will it take for all of them to finish a job together, given that B finishes this job alone in 32 days.

(1) 16/21 days   (2) 32/7 days

(3) 16/7 days   (4) 8/7 days

(5) None of these

Solution

B finishes in 32 days

Therefore, A will take 16 days and B will take 8 days

Time they require to finish the job together

= 1/(1/8 + 1/16 + 1/32)

1/(7/32) = 32/7 days

Question.

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 works for 4 days, whereupon A leaves. B continues for 2 more days and then leaves too. C now starts working and finished the job. How many days did C require?

(1) 4   (2) 5

(3) 8   (4) 3

(5) None of these

Solution

Work done by (A+B) in days = 4 ×3 =12 work

Work done by (A+B) in 2 days = 2×2 =4 work

Work remaining = 24 – 2 – 4 =8

Time taken by C = $\dfrac{8}{2}$ = 4 days

Question.

A man is thrice as fast as a woman and a woman is twice as fast as a boy in painting a wall. If all of them, a man, a woman and a

boy can paint the same wall in 8 hrs, in how many hrs a boy will do it alone?

(1) 36 hrs   (2) 12 hrs

(3) 72 hrs   (4) 64 hrs

(5) None of these

Solution

Let number of hrs taken by a boy to paint a wall= m.

Then number of hrs taken by a woman to paint a wall = m/2

And number of hrs taken by a man to paint a wall = m/6

Hence, we have

$$\Rightarrow \frac{1}{m} + \frac{2}{m} + \frac{6}{m} = \frac{1}{8}$$

$$\Rightarrow \frac{1+2+6}{m} = \frac{1}{8}$$

$$\Rightarrow \frac{9}{m} = \frac{1}{8}$$

$$\Rightarrow m = 72$$

Hence a boy will take 72 hrs to paint a wall alone.

Question.

4 men and 6 women together can complete a work in 8 days while 3 men and 7 women together can complete it in 10 days. 20 women working together will complete it in

(1) 36days   (2) 32 days

(3) 24 days   (4) 20days

(5) None of these

Solution

$8 \times 4m + 6w \times 8$

$= 10 \times 3m + 7 \times 10w$

$\Rightarrow 2m = 22w$

$\Rightarrow 1 m = 11w$

$\therefore 4m + 6w = 50w$

$\therefore M_1 D_1 = M_2 D_2$

$\Rightarrow 50 \times 8 = 20 \times D_2$

$D_2 = \dfrac{50 \times 8}{20} = 20$ days

Question.

A and B can do a piece of work in 30 and 36 days respectively. They began the work together but A left after some days and B finished the remaining work in 25 days. After how many days did A leave?
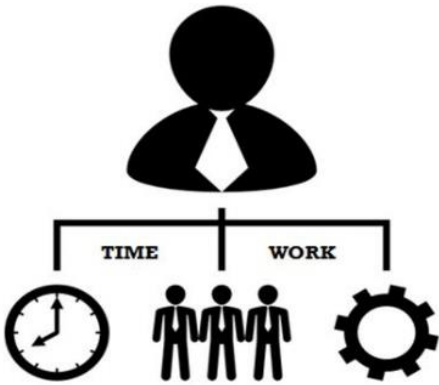
(1) 10 days   (2) 6 days

(3) 5 days   (4) 11 days

(5) None of these

Solution

Let A leave the work after x days.

According to the question,

$$\frac{x}{30} + \frac{x+25}{36} = 1$$

$$\Rightarrow \frac{6x + 5x + 125}{180} = 1$$

$$\Rightarrow 11x + 125 = 180$$

$$\Rightarrow 11x = 180 - 125$$

$$\Rightarrow 11x = 55$$

$$\Rightarrow x = \frac{55}{11} = 5 \text{ days}$$

Question.

x does $\dfrac{1}{4}$ of a job In 6 days. Y completes rest of the job in 12 days. Then x and y could complete the job together in

(1) 9 days   (2) $9\dfrac{3}{5}$ days

(3) $8\dfrac{1}{8}$ days   (4) $7\dfrac{1}{3}$ days

Solution

x does $\dfrac{1}{4}$ work in 6 days $\therefore$ x does 1 work in 24 days similarly,

Y does $\dfrac{3}{4}$ work in 12 days

$\therefore$ y does 1 work in $\dfrac{12 \times 4}{3}$

= 16 days

(x+y)'s 1 day's work

$$\frac{1}{24}+\frac{1}{16}=\frac{2+3}{48}=\frac{5}{48}$$

$$\therefore Required\ time = \frac{48}{5}$$

$$= 9\frac{3}{5}\ days$$

Question.

If 8 men and 24 boys can do a piece of work in 5 days while 17 men and 16 boys can do it in 4 days. What would be the ratio of number of days taken by a man to that taken by a boy to complete the piece of work?

(1) 2 : 3   (2) 2 : 5

(3) 1 : 2   (4) 3 : 2

(5) None of these

Solution

Let the number of days in which a man can finish the work be 'a' and the number of days in which a boy can finish the work be 'b'.

In 1 day,

A man finishes part of work = 1/a

A boy finishes part of work = 1/b

Given, 8 men and 24 boys can do a piece of work in 5 days.

In 1 day, they finish 1/5th of the work.

$$\therefore \frac{8}{a}+\frac{24}{b}=\frac{1}{5} \text{-------1}$$

Also given, 17 men and 16 boys can do it in 4 days.

In 1 day, they finish 1/4th of the work

$$\therefore \frac{17}{a}+\frac{16}{b}=\frac{1}{4} \text{-----------2}$$

Solving 1 and 2 we get,

a = 100 days and b = 200 days

∴ Ratio of number of days taken by a man to that taken by a boy to complete the piece of work = 100/200 = 1 : 2

Question.16 men can do 50% of a piece of work in 10 days. 10 women can do 75% of the same work in 15 days. Then in how many days can 80% of the same work be done by 8 men and 5 women?

(1) 20 days   (2) 24 days

(3) 15 days   (4) 16 days

(5) None of these

Solution

16 men do the whole work in 10 ×2

= 20 days

10 women do the whole work in (15 ×100)/75 = 20 days

16 men + 10 women do the whole work together in 10 days

Hence,

8 men + 5 women do whole work in = 20 days

So, Required days to do 80% of the work

= 20(80/100) = 16 days

Question.

Aditya and Anjali complete a piece of work in 10 and 15 days, respectively. If they work for 12 days alternately, starting with Aditya, in how many more days, will the work be completed?

(1) 0   (2) 1

(3) $10\frac{1}{2}$ (4) $10\frac{3}{4}$

(5) None of these

Solution

Part of the work done by A and B together in 2 days

$$=\frac{1}{10}+\frac{1}{15}=\frac{3+2}{30}=\frac{1}{6}$$

Part of the work done in first 12 days

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

It means whole work would be completed in 12 days. So, no other day would be required to finish the work.

Question.

Two students A and B has the ability to finish a research together in 30 days. They work together for 6 days and then A quits and B finishes the remaining research work in 32 more days. In how many days B do the whole research work alone?

(1) 30 days   (2) 32 days

(3) 34 days   (4) 40 days

(5) 45 days

Solution

Time taken by (A + B) = 30 days

1 day's work by (A + B) = (1/30) w/d

Work done in 6 days = 6/30 = 1/5

Remaining work = 1 – 1/5 = 4/5

then A quits and B finishes the book in 32 more days

1 day's work by B = $\dfrac{4/5}{32}=\dfrac{1}{40}$ w/d

∴Time taken by B to finish the task alone = 40 days.