

Time & Work Notes

$$\text{Time} = \frac{\text{Work done}}{\text{Efficiency}}$$

- When work is same.

$$\text{Time} \propto \frac{1}{\text{Efficiency}}$$

- If A can do a piece of work in n days.

$$\text{Then, per day working efficiency of A} = \frac{1}{n}$$

- If working efficiency of A & B is $\rightarrow x : y$

Then, time taken by A & B to finish the work is in the ratio $\rightarrow y : x$

e.g. If A does three times faster work than 'B', then ratio of work done by A and B is 3 : 1.

Then

$$\text{Ratio of time taken by A & B} = 1 : 3$$

- If A can do a piece of work in x days and B can do a piece of work in y days, then both of them working together will do the same work in

$$\frac{xy}{x+y} \text{ days}$$

Explanation

$$\Rightarrow \text{A's 1 day's work} = \frac{1}{x}$$

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

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

$$\text{A + B will complete the work in} = \frac{xy}{x+y}$$

- Q1.** A can finish a piece of work by working alone in 6 days and B, while working alone, can finish the same work in 12 days. If both of them work together, then in how many days, the work will be finished?

Sol. $x = 6, y = 12$

$$\text{Working together A + B will complete the work in} = \frac{xy}{x+y} = \frac{6 \times 12}{6+12}$$

$$= 4 \text{ days}$$

- If A, B & C will working alone, can complete a work in x, y and z days, respectively, then they will together complete the work

$$\text{in} \frac{xyz}{xy+yz+zx}$$

TEST SERIES

English



CTET 2019

PAPER-I

15 TOTAL TESTS

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Explanation

$$\Rightarrow A's \text{ 1 day work} = \frac{1}{x}$$

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

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

$$(A + B + C)'s \text{ 1 day work} = \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{yz+xz+xy}{xyz}$$

(A + B + C) will complete the work in

$$= \frac{xyz}{yz + xz + xy}$$

Q2. A, B and C can complete a piece of work in 10, 15 and 18 days, respectively. In how many days would all of them complete the same work working together?

Sol. $x = 10$ days, $y = 15$ days & $z = 18$ days

The work will be completed in

$$\begin{aligned} &= \frac{10 \times 15 \times 18}{10 \times 15 + 15 \times 18 + 18 \times 10} \\ &= \frac{2700}{600} = 4\frac{1}{2} \text{ days} \end{aligned}$$

- Two persons A & B, working together, can complete a piece of work in x days. If A, working alone, can complete the work in y days, then B, working alone, will complete the work in

$$\Rightarrow \frac{xy}{y-x}$$

Explanation

$$\Rightarrow A + B's \text{ 1 day work} = \frac{1}{x}$$

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

$$B's \text{ 1 day work} = \frac{1}{x} - \frac{1}{y} = \frac{y-x}{yx}$$

$$B \text{ will complete the work} = \frac{yx}{y-x}$$

Q3. A and B working together take 15 days to complete a piece of work. If A alone can do this work in 20 days, how long would B take to complete the same work?

Sol. $x = 15$, $y = 20$

$$\begin{aligned} B \text{ will complete the work in} &= \frac{15 \times 20}{5} \\ &= 60 \text{ days} \end{aligned}$$

- If A & B working together, can finish a piece of work in x days, B & C in y days, C & A in z days. Then, A + B + C working together will finish the job in

$$\Rightarrow \frac{2xyz}{xy+yz+zx}$$

TEST SERIES

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Explanation

$$\Rightarrow A + B \text{'s 1 day work} = \frac{1}{x}$$

$$B + C \text{'s 1 day work} = \frac{1}{y}$$

$$C + A \text{'s 1 day work} = \frac{1}{z}$$

[(A + B) + (B + C) + (C + A)]'s 1 day's work

$$= \frac{1}{x} + \frac{1}{y} + \frac{1}{z}$$

$$= \frac{yz+xz+xy}{xyz}$$

$$2(A + B + C) \text{'s 1 day work} = \frac{xy + yz + xz}{xyz}$$

$$A + B + C \text{'s 1 day work} = \frac{xy + yz + xz}{2xyz}$$

A + B + C working together will complete the work in

$$= \frac{2xyz}{xy+yz+xz}$$

Q4. A and B can do a piece of work in 12 days, B and C in 15 days, C and A in 20 days. How long would they take to complete the full work together?

Sol. $x = 12$ days, $y = 15$ days, $z = 20$ days

$$A + B + C = \frac{2 \times 12 \times 15 \times 20}{180 + 300 + 240}$$

$$= \frac{7200}{720} = 10 \text{ days}$$

TEST SERIES

English



CTET: PAPER II

Maths & Science

10 TOTAL TESTS

Validity : 12 Months



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