

Time and Work Formulae

Given below are the basic type of questions which may be asked in the exam with respect to the time and work topic:

- To find the efficiency of a person
- To find the time taken by an individual to do a piece of work
- To find the time taken by a group of individuals to complete a piece of work
- Work done by an individual in a certain time duration
- Work done by a group of individuals in a certain time duration

Work: Amount of job assigned or the amount of job actually done.

Relations between work, time and person

- Work & Person: Directly proportional i.e. more work, more person required.
- Time & Person: Inversely proportional i.e. more people, less time required.
- Work & time: Directly proportional i.e. more work, more time required.

Rules:

- If a person's one day's/ hour's work = $1/n$, then he will complete the work in 'n' days/ hours.
- If first person is 'n' times efficient than second person then work done by first person : second person = $n : 1$
- If the ratio of number of men required to complete a work is $m : n$ then the ratio of time taken by them will be $n : m$.

Formulas and Quick Tricks for Time and Work:

- If $1/n$ of a work is done by A in one day, then A will take n days to complete the full work.
- If A can do a piece of work in X days and B can do the same work in Y days, then both of them working together will do the same work in $\frac{XY}{(X+Y)}$ days
- If A, B and C, while working alone, can complete a work in X , Y and Z days respectively, then they will together complete the work in $\frac{XYZ}{(XY+YZ+ZX)}$ days
- If A and B can together finish a piece of work in X days, B and C in Y days and C and A in Z days, then
 - 1) A, B and C working together will finish the job in $\frac{2XYZ}{XY+YZ+ZX}$ days.
 - 2) A alone will finish the job in $\frac{2XYZ}{XY+YZ-ZX}$ days.
 - 3) B alone will finish the job in $\frac{2XYZ}{XY-YZ+ZX}$ days.
 - 4) C alone will finish the job in $\frac{2XYZ}{ZX+YZ-XY}$ days.
- If A can finish a work in X days and B is k times efficient than A, then the time taken by both A and B working together to complete the work is $\frac{X}{1+K}$



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