TIME & WORK

TIME : The amount of time taken by a person to complete a task is called Time.

WORK : The number of parts of work completed by a person for certain duration is called Work.

Rate of Work (or) Efficiency: It is the ratio of "1" to the total time taken by the person.

- If A completed a work in "10" days then Rate of work of A (or) A's one day work is $\frac{1}{10}$
- If B completed a work in 12 hours , the Rate of work of B (or) B's one hour work is $\frac{1}{12}$

➢ **Total Work Done = Number of Days × Efficiency**

- **If the work is same for two persons then the amount of time taken by each person is inversely proportional to efficiency of each person,**

$$T_1 : T_2 = E_1 : E_2$$

- **If 'W1' work is done by 'M1' people in 'D1' days, working 'T1' hours in a day and 'W2' work is done by 'M2' people in 'D2' days, working 'T2' hours in a day, then the relation between them will be**

$$\frac{W1}{M1 \times D1 \times T1} = \frac{W2}{M2 \times D2 \times T2}$$

BASIC PROBLEMS:

1) (i) A can do a piece of work in 10 days, then what is the efficient of A.

(ii) Ram can complete a work in 15 days with an efficiency of "6" units a day, then find total units of work.

(iii) A can complete a work in 10 day , the Ratio of Efficiency of A to B is 1:2, then in how many days B can complete the work.

Model : 1

1) A alone can do a piece of work in 10 days, whereas B alone can do the work in 15 days. In how many days A and B together complete the work ?

2) 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

3) A & B can do a job in 10 days, B & C in 15 days, and C & A in 12 days. In how many days can they finish it, if they work together ?

4) If P can do a work in 6 days and Q can do the same work in 8 days. If R who can do the same work in 12 days joins them, then work will be completed in how many days ?

5) A and B can do a job in 16 days and 8 days respectively. They work on alternate days, A beginning the work. In how many days will the work be finished ?

6) The number of days required by A, B and C to work individually is 6, 12 and 8 respectively. They started a work doing it alternatively. If A has started then followed by B and so on, how many days are needed to complete the whole work ?

7) A is thrice as efficient as B and hence completes a work in 40 days less than the number of days taken by B. What will be the number of days taken by both of them when working together ?

Model : 2

1) A fort has provision for 50 days. If after 10 days, they are strengthened by 1000 men and the remaining food lasts 32 days, how many men were there in the fort initially ?

2) A certain number of persons can complete a work in 100 days. If there be 10 persons less, it would have taken 10 days more for the work to be completed. The number of persons in the beginning was .

3) A contractor engaged 25 men to do a job in 31 days. Later he found that the work will not be completed before the deadline. After 25 days, he took 15 more men and finished the job one day earlier. If he had not taken the additional men, how many days behind the schedule would the work be completed ?

4) 16 workers working 6 hours a day can build a wall of length 150 metres, breadth 20 metres and height 12 metres in 25 days. In how many days 12 workers, working 8 hours a day can build a wall of length 800 metre, breadth 15 metre and height 6 metre.

5) 56 workers can finish a piece of work in 14 days. If the work is to be completed in 8 days, then how many extra workers are required ?

Model: 3

1) 9 women can complete a piece of work in 19 days working 10 hours a day. How many days will 18 women working 5 hours a day take to complete the same piece of work ?

2) If 2 men or 3 women or 4 boys can do a piece of work in 52 days, then the same piece of work will be done by 1 man, 1woman and 1 boy in :

3) Men , women and children are employed to do a work in the proportion of 3:2:1 and their wages as 5:3:2. When 90 men are employed, total daily wages of all amounts Rs. 10350. Find the daily wages of one man

4) 3 men and 4 boys can earn Rs. 756 in 7days. 11 men and 13 boys can earn Rs.3008 in 8 days. In what time will 7 men with 9 boys earn Rs. 2480 ?

5) 3 men, 4 women and 6 children can complete a work in 7 days. A woman does double the work a man does and child does half the work a man does. How many women alone can complete this work in 7 days?

Pipes & Cistern:

1) Two pipes P & Q can fill a cistern in 24 and 32 hours respectively. If both the pipes are opened together, when the first pipe must be turned off ? so ,that the cistern may be just filled in 16 hours ?

2) Pipe A and Pipe B can fill a tank in 10minutes and 15 minutes and another pipe C can empty full tank in 20 minutes , if all these pipes operates simultaneously , then find the time taken to fill complete tank .

3) There are 4 filling pipes and 3 emptying pipes capable of filling and emptying in 12 minutes and 15 minutes respectively. If all the pipes are opened together and as a result they fill 10 litres of water per minute. Find the capacity of the tank.

4) Two pipes P & Q can fill a cistern in 24 and 32 hours respectively. If both the pipes are opened together, when the first pipe must be turned off so that the cistern may be just filled in 16 hours ?

5) A tap can empty a tank in 30 minutes. A second tap can empty it in 45 minutes. If both the taps operate simultaneously, how much time is needed to empty the tank ?

6) Two pipes A and B can fill a tank in 15 minutes and 20 minutes respectively. Both the pipes are opened together but after 4 minutes, pipe A is turned off. What is the total time required to fill the tank ?

7) A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely ?

8) Three pipes A, B and C can fill a tank in 6 hours. After working at it together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. The number of hours taken by C alone to fill the tank is: