Time and work

Theory

In the context of the CAT, you have to understand the following basic concept of this chapter.
If A does a work in a days, then in one day A does

→1/a of the work

If B does a work in b days, then in one day B does

→1/b of the work

Then, in one day, if A and B work together, then their combined works is 1/a + 1/b.

Or a+b/ab

In the above case, we take the total work to be done as" 1 unit of work". Hence, the work will be completed when 1 unit of work is completed.

Alternative approach

Instead of taking the value of the total work as 1 unit of work, we can also look at the total work as 100 per cent work. In such a case, the following rule applies:

If A does a work in a days, then in one day A does

→ 100/a% of the work

If B does a work in b days, then in one day B does

→ 100/b% of the work

Then, in one day, if A and B work together, then their combined work is

100/a + 100/b

The Concept of Negative Work

Suppose, that A and B are working to build a wall while C is working to break the wall. In such a case, the wall is being built by A and B while it is being broken by C. Here, if we consider the works as the building of the wall, we can see that C is doing negative works.

Time and work

Application of Product Constancy Table to time and Work

The equation that applies to Time and Work problems is

Work Rate x Time = Work done

This equation means that if the work done is constant, then →

Work rate is inversely proportional to time. Hence, the product Constancy Table will be directly applicable to time and work questions.

WORK EQUIVALENCE METHOD (To Solve Time and Work Problem)

The work equivalence method is nothing but an application of the formula:

Work rate x Time = Work done (or work to be done)

Thus, if the work to be done is doubled, the product of *work rate x time* also has to be doubled. Similarly, if the work to be done increase by 20%, the product of *work rate x time* also has be increased by 20% and so on.

This method is best explained by an en example:

A contractor estimates that he will finish the road construction project in 100 days by employing 50 men.

However, at the end of the 50^{th} day, when as per his estimation half the work should have been completed, he finds that only 40% of his work is done.

a. How many more days will be required to complete the work
b. How many more men should he employ in order to complete the work in time?

The Specific Case of Building a Wall (Work as Volume of work)

As already mentioned, in certain cases, the unit of work can also be considered to be in terms of the volume of work.

For example, building of a wall of a certain length, breadth and height.
In such cases, the following formula applies.

Time and work

The Concept of Efficiency

The concept of efficiency of closely related to the concept of work rate.

When we make a statement saying A is twice as efficient as B, we mean to say that A does twice the work as B in the same time. In other words, we can also understand this as A will require half the time required by B to do the same work.