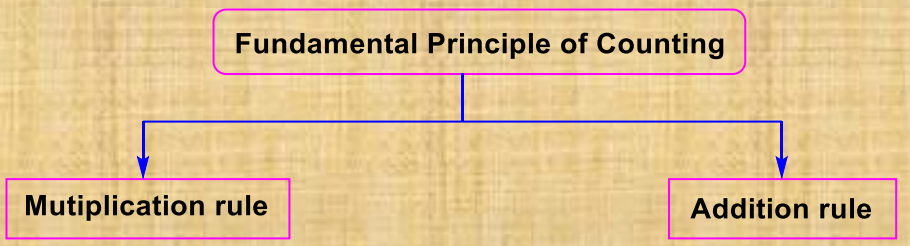
Brainbox learn easy

Chapter 07

PERMUTATIONS AND COMBINATIONS

FUNDAMENTAL PRINCIPLE OF COUNTING:

There are two rules of counting – one is called as Multiplication rule(Product rule) and another as Addition rule(Sum rule).

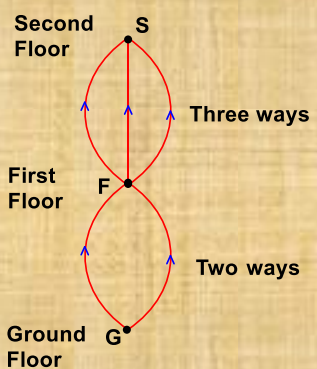


Multiplication rule:

Suppose in our school, there are two ways to reach to first floor. After that there are three ways to reach to second floor from first floor. Now our aim here is to find out that how many possible ways are available for us to reach to second floor while starting from ground floor.

From G to F; we go by two possible paths.

From F to S; we go by three possible paths.



Corresponding to each path from G to F, there are three possible paths from F to S.

Thus, total number of ways to go from G to F,

$= 2 \times 3 = 6$ paths.

Let there are ‘m’ ways to go from G to F and there are ‘n’ ways to go from F to S. So, there are $m \times n$ ways to go from G to S.

Thus, we conclude multiplication principle as follows:

If suppose one work ‘A’ can be done in ‘m’ ways,following which another work ‘B’ can be done in ‘n’ ways. Now there is a work ‘C’ which can be completed if A and B are completed. Then number of ways to do work $'C' = m.n$.

Suppose we have two jeans and three T-shirts. Then how many different ways can be dress up?

Number of ways $= 2 \times 3 = 6$ ways.

Addition rule:

Now suppose that there are two stair cases to reach second floor from ground and three lifts. Then the number of ways to reach second floor will be equal to five.

Number of ways $= 2 + 3$ (addition rule).

Formally, we can state that if work ‘A’ is completed in ‘m’ ways and work ‘B’ is completed in ‘n’ ways. Now ‘C’ is a job which is done only when either ‘A’ or ‘B’ is completed, then the number of ways to complete job ‘C’ will be $(m + n)$.