PROBABILITY

We can also define probability as the measure of events taking place under certain laws of chance. So when we are talking about chance, we are making statements about expected outcomes. These statements can be expressed in terms of probability values.

There are two types of probabilities namely: theoretical or mathematical probability and empirical or experimental probability.

Terms Used in Probability

In throwing a die once, there are six possible outcomes. Either a 1, or 2, or 3, or 4, or 5, or 6. Each of the numbers 1, 2, 3, 4, 5 or 6 has equal chances of occurrence, so we describe them as equally likely (i.e. 1, 2, 3, 4, 5, or 6 can appear), or equiprobable.

Equiprobable Sample Space: the set of possible outcomes or results is called a sample space and each possible outcome is called an event. Example,

in a throw of a die, the possible outcomes are 1, 2, 3, 4, 5, or 6, this is called the equiproble sample space (S) or in a throw of a coin. The sample space is a head and a tail i.e. {H, T}. Hence, the sample space here is the total number of the results of the experiment.

Experiment is the actual throwing of the die, or the tossing of the coins, etc. and each of the throw of a dice or a coin is called a trial or event.

Mutually exclusive means the occurrence of one necessarily excludes all the others. For example: in a throw of a die, the scores 1, 2, 3, 4, 5, 6 are mutually exclusive, i.e. two scores (events) cannot happen at the same time in one throw, (i.e. they do not overlap) and so they are mutually exclusive.

Independent events mean two or more events that have no influence on one another. For example, the getting of a 6 from a throw of a die and getting a head from a coin tossed are independent outcomes, so they are independent.

The probability of event (E) occurring in an experiment is denoted by

$$p(E) = \frac{n(E)}{n(S)}$$

Where $p\,(E) \Rightarrow$ probability of an event occurring

$n\,(E) \Rightarrow$ number of elements/events

$n\,(S) \Rightarrow$ total number of ways in which the experiment/result can happen (i.e. total number of elements in the sample space)

The probability of an event is equal to the number of possible outcomes over total outcomes. Probability (P) can also be defined as:

$$p(event\ A) = \frac{number\ of\ equiprobable\ favourable\ outcomes}{total\ of\ all\ number\ of\ all\ equiproable\ outcomes}$$