

# Probability Distributions

## Probability:-

The word 'Probability' means the chance of occurring of a particular event.

Definition:- The Probability of happening of an event A, denoted by P(A) is defined as

$$P(A) = \frac{\text{number of cases favourable to A}}{\text{number of possible Outcomes}}$$

Thus, if an event can happen in m ways and fails to occur in n ways and m+n ways equally likely to occur then the probability of happening of the event A is given by:-

$$P(A) = \frac{m}{m+n}$$

And the Probability of non-happening of A is

$$P(\bar{A}) = \frac{n}{m+n}$$

## Important Terms Related to Probability:-

① Trial and Event:- The Performance of an experiment is called a trial, and set of its outcomes is termed as event.

Example Tossing a coin and getting head is

trial. Then the event is  $\{HT, TH, HH\}$ .

② Sample Space - The set of all possible outcomes of an experiment is called Sample Space.

It is denoted by  $S$ .

Example: When a die is thrown, sample space is

$$S = \{1, 2, 3, 4, 5, 6\}$$

It consists of six outcomes 1, 2, 3, 4, 5 and 6.

③ Random Experiments - In which all the possible outcomes of the experiment are known in advance.

Example: Rolling a die, Tossing a coin.

④ Outcome : The result of a random experiment is called an Outcome.

⑤ Complement of Event :- The set of all outcomes which are in sample space but not an event is called the complement of an event.

⑥ Equally likely Events :- It means each outcome is as likely to occur as any other outcome. Example: - when a die is thrown, all the six faces i.e. 1, 2, 3, 4, 5 and 6 are equally likely to occur.

⑦ Disjoint Events :- The events that cannot occur simultaneously.