Probability

NOTES

FUNDAMENTALS

- When the chance of occurring an event expressed quantitatively it is known as probability. In other words, probability is a concept of measuring the degree of uncertainty.
- **Experiment:-** An operation which can produce some well-defined results is known as an experiment.
- Random Experiment:- An operation in which an possible results are known but the exact result cannot be predicted in advance in known as random experiment.

Example:- Throwing of an unbiased die.

Tossing of a fair coin.

Drawing a card from a well - shuffled pack of cards.

When an unbiased coin is tossed, then either a Head (H) or a (T) appears.

- A dice is well balanced cube with its six faces marked with numbers 1, 2, 3, 4, 5, 6 respectively. Hence when we throw a die, the outcome is the number that appears on its upper face.
- Sample Space:- The set of all possible results in a random experiment is called a sample space and it is generally denoted by S.

Example:- In tossing a coin

 $S = \{H, T\}$ In tossing two coins, $S = \{HH, TT, HT, TH\}$ In throwing a die, $S = \{1, 2, 3, 4, 5, 6\}$

Event:- Any subset of a sample space is called an event.
Example:- In a single throw of a die, the event of getting an prime number is given by E = {2, 3, 5}
Obviously, here sample Space (S) = {1, 2, 3, 4, 5, 6}
Here E ⊂ S i.e., E is a subset of S.

Probability of occurrence of an event

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$$P(E) \frac{\text{Number of favourable outcomes}}{\text{Number of possible outcomes}} = \frac{n(E)}{n(S)}$$

RESULTS ON PROBABILITY

- Probability of a same event is 1.
- > Probability of an impossible event = 0. i.e., P(E) = 0
- Sum of the possibilities of an outcome of an experiment is 1. i.e., P(S) = 1

So the possibility of any events lies between 0 and 1. i.e., $0 \le p(E) \le 1$



There are 4 honours of each suit viz. Aces, Kings, Queens and Jacks.

> There are three face cards of each suit, king, Queen and Jack.