CBSE Class 10 Maths Notes Chapter 14 Probability

Probability: It is the numerical measurement of the degree of certainty.

- Theoretical probability associated with an event E is defined as "If there are 'n' elementary events associated with a random experiment and m of these are favourable to the event E then the probability of occurrence of an event is defined by P(E) as the ratio $\frac{m}{n}$ ".

$$P(E) = \frac{Number\ of\ outcomes\ favourable\ to\ E}{Number\ of\ all\ possible\ outcomes\ of\ the\ experiment} \cdot \quad Thus,\ P(E) = \frac{m}{n}$$

- If P(E) = 1, then it is called a 'Certain Event'.
- If P(E) = 0, then it is called an 'Impossible Event'.
- The probability of an event E is a number P(E) such that: $0 \leq P(E) \leq 1$
- An event having only one outcome is called an elementary event. The sum of the probabilities of all the elementary events of an experiment is 1.
- For any event E, $P(E) + P(\bar{E}) = 1$, where $\bar{E}$ stands for 'not E'. E and $\bar{E}$ are called complementary events.
- Favourable outcomes are those outcomes in the sample space that are favourable to the occurrence of an event.

Sample Space

A collection of all possible outcomes of an experiment is known as sample space. It is denoted by 'S' and represented in curly brackets.

Examples of Sample Spaces:

A coin is tossed = Event

E_1 = Getting a head (H) on upper face

E_2 = Getting a tail (T) on upper face

S = {H, T}

Total number of outcomes = 2

Two coins are tossed = Event = E

E_1 = Getting a head on coin 1 and a tail on coin 2 = (H, T)

E_2 = Getting a head on both coin 1 and coin 2 = (H, H)

E_3 = Getting a tail on coin 1 and a head on coin 2 = (T, H)

E_4 = Getting a tail on both, coin 1 and coin 2 = (T, T)

S = {(H, T), (H, H), (T, H), (T, T)}.

Total number of outcomes = 4

NOTE: In probability the order in which events occur is important
E_1 & E_3 are treated as different outcomes.

Important Tips

- **Coin:** A coin has two faces termed as Head and Tail.
- **Dice:** A dice is a small cube which has between one to six spots or numbers on its sides, which is used in games.
- **Cards:** A pack of playing cards consists of four suits called Hearts, Spades, Diamonds and Clubs. Each suite consists of 13 cards.