# PROBABILITY

# RANDOM EXPERIMENTS

## 1. RANDOM EXPERIMENT

It is a process that can yield any of its well-defined outcomes, and predicting the outcome with certainty is not possible.

#### For example

- Certain random experiments include:
- Coin toss, resulting in either heads or tails
- Rolling a die, leading to any one of its six faces
- Drawing a card from a deck of 52 cards, resulting in any one of the 52 cards

### 2. SAMPLE SPACE AND SAMPLE POINTS

The collection of all conceivable outcomes in a random experiment is termed the sample space, denoted by S. Each potential outcome, that is, every element within this set, is referred to as a sample point.

#### For example:

- In a coin toss, the sample space is denoted by S = {H, T}, where H and T represent a head and a tail, respectively.
- In a die throw, the sample space is given by  $S = \{1, 2, 3, 4, 5, 6\}$ , where the numbers represent the six faces as sample points.
- **3. TRIAL** (For competitive exam)

When an experiment is conducted repeatedly under consistent conditions and does not yield the same outcome each time but can result in any of several possible outcomes, the experiment is referred to as a trial, and the outcomes are termed cases. The count of how many times the experiment is repeated is known as the number of trials.

#### For example:

- A single coin toss constitutes a trial when the coin is tossed five times.
- A single die throw is considered a trial when the die is thrown four times.