

Experiment :

It is a physical process which we can perform and note the result.

There are 2 types of experiments.

1. Deterministic experiment.
2. Random experiment.

Deterministic experiment :

An experiment where we can predict the outcome with certainty before starting the experiment is a deterministic experiment.

Eg: 1. $R = \frac{E}{C}$

Eg: 2. Throwing a stone in air

Random experiment :

An experiment where the outcome cannot be predicted with certainty is known as Random exp or probabilistic exp.

Eg: Tossing a coin.

Sample Space :

The set of all outcomes of a random exp is known as a Sample Space. It is denoted by 'S'.

Eg: 1. Tossing a coin
 $S = \{HT\}$

Eg: 2. throwing a die

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

Event: A subset of sample space is known as event.

Eg: Tossing a die.

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

$E_1 =$ getting an even no. = $\{2, 4, 6\}$

$E_2 =$ " " odd no. = $\{1, 3, 5\}$

} Compound events.

$E_3 =$ getting no. $\{3\} \rightarrow$ simple events.

Favourable Events: Events that are favourable for the occurrence of an event 'E' are known as favourable events.

Eg: Throwing a die

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

$E =$ getting an even no. = $\{2, 4, 6\}$

$E_1 =$ getting no $\{2\}$

$E_2 =$ " " $\{4\}$

$E_3 =$ " " $\{6\}$

} favourable events.

Mutually Exclusive events:

Two events E_1, E_2 are said to be mutually exclusive events if they do not occur simultaneously i.e. $E_1 \cap E_2 = \phi$.

Eg: Tossing a coin $S = \{H, T\}$

$E_1 =$ getting a head.

$E_2 =$ getting a tail.

$$E_1 \cap E_2 = \emptyset$$

E_1, E_2 are mutually exclusive events.

Equally likely Events : A set of events E_1, E_2, \dots, E_n are said to be equally likely events if no one of them is expected to occur in preference to others.

eg: Tossing a coin

$$S = \{H, T\}$$

H, T are equally likely events (H, T has same chance of getting i.e. both have 50% chance).

|| All six faces of a die are equally likely events.

Independent Events : Two events E_1, E_2 are said to be independent events if occurrence or non occurrence of one event has no effect on the result of other event.

eg: When two dice are thrown the result of one die has no effect on the other.

Probability : If there are n mutually exclusive and equally liked events and m events are favourable for the event E to occur then the probability of event E is $P(E) = \frac{m}{n}$.

$$= \frac{\text{no. of favourable cases}}{\text{Total no. of cases.}}$$