Probability

Set:-

A set is any well-defined collection of distinct objects e.g group of students, the books in library e.t.c.

Sample Space :-

A complete list of all possible outcomes is called sample space.

Experiment:-

Experiment means a planned activity or process whose result yields a set of data.

Random experiment :-

which produces different results even though it is repeated a large number of times under similer conditions. e.g tossing a coin.

Trial:-

A single performance of an experiment is called trial.

Outcome:-

The result obtained from an experiment.

Event:-

outcomes in which you are interested or An event is an individual outcome or any number of outcomes of a random experiment or trial.

Simple event:- It contains exactly one sample point.

Compound event:- A compound event contains more than one sample point and is produced by the union of simple events.

Mutually exclusive Events:- Two events A and B of a single experiment are said to be mutually exclusive events or disjoint if they cannot occur together at the same time.

⇒ No points in common

e.g A student either Qualifies or Fail.

Exhaustive events:- Events are said to be exhaustive when the union of mutually exclusive events is the entire sample space e.g coin tossing experiment.

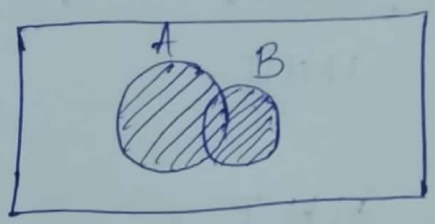
Equally likely Events:- Two events A and B are said to be equally likely when one event is as likely to occur as the other. e.g In coin tossing experiment head is as likely to occur as tail.

Venn Diagram:-

A diagram that is understood to represent sets by circular regions, parts of circular regions or their complements with respect to a rectangle representing the sample space S is called a venn diagram.

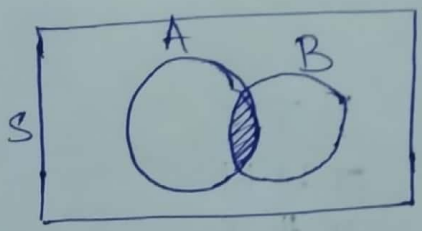
⇒ Venn diagrams are used to represent sets and subsets in pictorial way and to verify the relationship among sets and subsets.

i) Union of two set A and B.



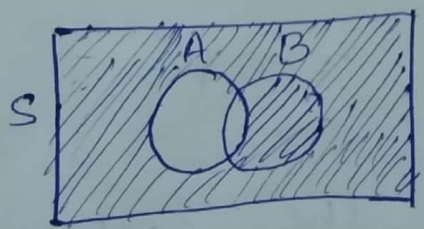
$A \cup B$ is shaded.

ii) Intersection of sets.



$A \cap B$ is shaded.

iii) Complementation



$\overline{A}$ or A^c

Tree Diagram:-

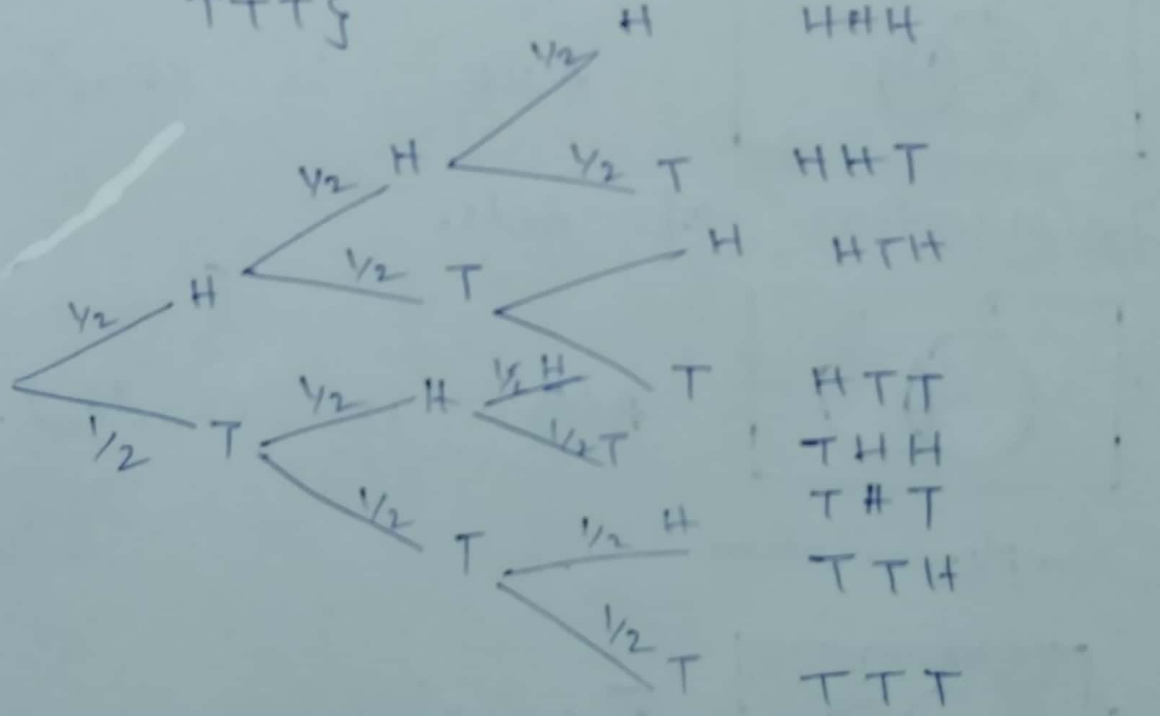
A way of representing a sequence of events particularly used in probability since they record all possible outcomes in a clear and uncomplicated manner.

OR

Tree diagram allows us to see all possible outcomes to an event and calculate their probability.

A tree diagram which represents a coin being tossed three times.

S.S = {HHH, HHT, HTH, HTT, THH, THT, TTH, TTT}



Cartesian Product of sets:-

The cartesian product of sets A and B, denoted by A×B is a set that contains all ordered pairs (x,y)

Let A = {H, T} B = {1, 2, 3, 4, 5, 6}

A×B = {(H,1) (H,2) (H,3) (H,4) (H,5) (H,6) (T,1) (T,2) (T,3) (T,4) (T,5) (T,6)}

Probability :-

Probability is quantitative measure of uncertainidy or game of chance.

⇒ uncertainty is when we are not sure about something - For instance it is likely to rain today or not or when we toss a coin e-t-c uncertainty in all these cases measured by probability -

In many situations you may be unsure about the outcome of some activity or experiment - Although you know what the possible outcomes are.

$$P(A) = \frac{\text{Favourable outcomes}}{\text{Total outcomes}}$$

⇒ For any event A, $0 \leq P(A) \leq 1$.

⇒ $P(S) = 1$, Sum of Probabilities is one.

⇒ If A and B are mutually exclusive events then $P(A \cup B) = P(A) + P(B)$