

Chapter 13

PROBABILITY

AXIOMATIC APPROACH TO PROBABILITY:

Definition: Let S be the sample space of a random experiment. $P(S)$ is the set of all possible events of the experiment.

Then a function $P: P(S) \rightarrow R$ satisfying the following axioms is called a probability function.

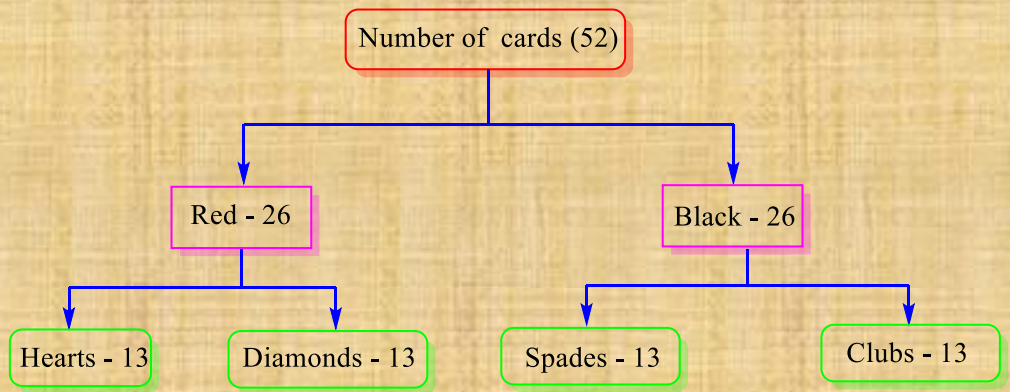
(1) Axiom of non-negativity: $P(A) \geq 0 \forall A \in P(S)$

(2) Axiom of certainty : $P(S) = 1$

(3) Axiom of additivity: If $A, B \in P(S)$ and $A \cap B = \phi$ then $P(A \cup B) = P(A) + P(B)$

Here for each $A \in P(S)$, the non-negative real number $P(A)$ is called the probability of the event A .

NOTE: Details of the cards of a pack of playing cards:



- (a) In a deck of 52 cards there are 13 cards each of the four suits viz 13 cards of hearts, 13 cards of diamonds, 13 cards of clubs and 13 cards of spades. The cards of hearts and diamonds are of red colour where as the cards of clubs and spades are of black colour.
- (b) In the thirteen cards of each suit there are four picture cards(honours) viz. Ace, king, queen and jack(knave). All the cards are known as court cards except the king.
- (c) The king, the queen and the jack(knave) are known as face – cards.

