UNIT-III: Basics Of Probability

Author : Statistics Department **Date :** 2025

Concept of Experiments, Sample Space, and Events

- **Experiment**: A process leading to well-defined outcomes.
  - **Sample Space (S)**: The set of all possible outcomes.
  - **Event (E)**: A subset of the sample space.

Combinatorial Probability

Used to compute probabilities by counting favorable outcomes.
Formula: $P(A) = \frac{n(A)}{n(S)}$ where $n(A)$ is the number of favorable cases and $n(S)$ is the total cases.

Conditional Probability

Probability of an event occurring given another event has occurred.
Formula: $P(A|B) = \frac{P(A \cap B)}{P(B)}$

Bayes Theorem

Used to revise probabilities based on new information.
Formula: $P(A|B) = \frac{P(B|A)\ P(A)}{P(B)}$