

Question Bank**Descriptive Statistics and Probability****Unit 1**

1. Write short notes on types of data.
2. State the relation between central moment in terms of non-central moment.
3. Write the relation between non-central moment in terms of central moment.
4. Explain the various measures of dispersion and merits and demerits of it.
5. Show that the Karl Pearson co-efficient of skewness lies in between ± 3 .
6. Explain skewness and kurtosis. Derive the limits of the Bowley's co-efficient of skewness.
7. Show that for discrete distribution $\beta_2 > 1$.
8. How do you design questionnaire and schedule? What are the merits and demerits?
9. Problems based on moments, skewness, kurtosis, mean, median, mode, standard deviation and quartile deviation.

Unit-2

1. State and prove Addition theorem of probability.
2. Explain the extension of Addition theorem.
3. State and prove Multiplication theorem for 'n' events.
4. Explain the extension of Multiplication theorem.
5. Describe the Boole's Inequality.
6. Explain the Bayes's theorem.
7. Problems based on probability.
8. Definitions of:
 - a. Random experiment
 - b. Trial and Event
 - c. Sample Space
 - d. Simple event
 - e. Composite event
 - f. Exhaustive event
 - g. Mutually Exclusive event
 - h. Favorable event
 - i. Equally likely event
 - j. Impossible Event
 - k. Sure or Certain Event.

Unit-3

1. Definitions of
 - a. Random variable
 - b. Distribution function
 - c. Continuous Random Variable.
2. State and prove properties of distribution function.
3. Problems based on Probability distribution (mass) function and Probability density function.
4. Definitions of:
 - a. Marginal distribution function
 - b. Marginal Probability function
 - c. Conditional Probability function
 - d. Stochastic Independence
5. Problems based on Marginal Probability mass function and Probability density function.

Unit-4

1. State and prove Addition theorem of expectation.
2. State and prove Multiplication theorem of expectation
3. Describe about variance and its properties.
4. Explain about covariance and its properties.
5. Problems based on expectations.
6. Describe the calculation of Moment Generating function and its properties.
7. Describe about Cumulant Generating Function and its properties.
8. Explain the Characteristic function and its properties.
9. Definition of Probability Generating Function and its properties.
10. State and prove Cauchy Schwartz Inequality.
11. State and prove Chebychev's Inequality