Kakatiya University, Warangal
B.A/B.Sc. (Statistics) I Year, Semester-I
(CBCS)(With Mathematics Combination)
(Examination at the end of I Year, Sem-I)

Paper-I: Descriptive Statistics and Probability (DSC-2A)
(4 HPW :: 4 Credits :: 100 Marks)

Unit-I

Descriptive Statistics: Concept of primary and secondary data, Methods of collection and editing of primary data, Designing a questionnaire and a schedule, Sources and editing of secondary data, Classification and tabulation of data, Measures of central tendency (Arithmetic mean, median, mode, geometric mean and harmonic mean) with simple applications, Absolute and relative measures of dispersion (range, quartile deviation, mean deviation, standard deviation and variance) with simple applications, Importance of moments, central and non-central moments, their inter-relationships, Sheppard's correction for moments for grouped data, Measures of skewness based on quartiles and moments, kurtosis based on moments with real life examples.

Unit-II

Probability: Basic concepts of probability, deterministic and random experiments, trial, outcome, sample space, event, operations of events, mutually exclusive and exhaustive events, equally likely and favorable events with examples, Mathematical, Statistical and Axiomatic definitions of probability, their merits and demerits. Properties of probability based on axiomatic definition, Conditional probability and independence of events, Addition and multiplication theorems for 'n' events, Boole's inequality and Bayes' theorem, Problems on probability using counting methods and theorems.

Unit-III

Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations. Distribution function and its properties, Transformation of one-dimensional random variable (simple 1-1 functions only), Notion of bivariate random variable, bivariate distribution, statements of its properties, Joint, marginal and conditional distributions, Independence of random variables.

Unit-IV

Mathematical Expectation: Mathematical expectation of a function of a random variable, Raw and central moments, covariance using mathematical expectation with examples, Addition and multiplication theorems of expectation. Definitions of moment generating function (m.g.f), characteristic function (c.f), cumulant generating function (c.g.f), probability generating function (p.g.f) and statements of their properties with applications, Chebyshev's and Cauchy-Schwartz's inequalities and their applications.

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List of reference books:

1. Charles M.Grinstead and Laurie Snell, J: Introduction to Probability, American Mathematical Society.
2. William Feller: Introduction to Probability theory and its applications, (Vol-I), Wiley.
3. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
4. Goon A M, Gupta M K, Das Gupta B: Fundamentals of Statistics, (Vol-I), The World Press (Pvt) Ltd., Kolkata.
5. Hoel P.G: Introduction to Mathematical Statistics, Asia Publishing house.
6. M. Jagan Mohan Rao and Papa Rao: A Text book of Statistics (Paper-I).
7. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan , New Delhi.
8. Hogg,Tanis, Rao: Probability and Statistical Inference, (7th edition), Pearson.
9. Telugu Academy: Sambhavyatha-Avadhi Siddanthaalu.
10. Telugu Academy: Saha Sambandhamu-Vibhajana Siddanthaalu.
11. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC, PHI.
12. Gerald Keller: Applied Statistics with Microsoft Excel, Duxbury, Thomson Learning.
13. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel (4th edition), Pearson Publication.
14. Abraham, Kendall and Baker: Discrete Mathematics for Computer Science.

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Practical-1

Descriptive Statistics and Probability
(2 HPW :: 1 Credit :: 50 Marks)

1. Graphical presentation of data (Histogram, frequency polygon, Ogives) on graph sheets.
2. **Graphical presentation of data (Histogram, frequency polygon, Ogives) using MS-Excel.**
3. Diagrammatic presentation of data (Various types of Bar and Pie diagrams) on graph sheets.
4. **Diagrammatic presentation of data (Bar and Pie) using MS-Excel.**
5. Computation of Measures of central tendency, dispersion, Coefficient of Variation and coefficients of Skewness, Kurtosis using calculator.
6. **Computation of Measures of central tendency, dispersion, Coefficient of Variation and coefficients of Skewness, Kurtosis using MS-Excel.**
7. Computation of non-central and central moments – Sheppard's corrections for grouped data using calculator.
8. **Computation of non-central and central moments – Sheppard's corrections for grouped data using MS-Excel.**
9. Computation of coefficients of Skewness and Kurtosis, Karl Pearson's and Bowley's β_1 and β_2 using calculator.
10. **Computation of coefficients of skewness and kurtosis, Karl Pearson's and Bowley's β_1 and β_2 using MS-Excel.**

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