# KAKATIYA UNIVERSITY

Under Graduate Courses (Under CBCS AY: 2019-2022)

**B.Sc. STATISTICS**

**I Year :: Semester-I**

## DSC-1/Paper-1: **Descriptive Statistics and Probability**

[4 HPW:: 4 Credits :: 100 Marks (External:80, Internal:20)]

### Unit-I

**Descriptive Statistics:** Concepts of primary and secondary data, Methods of collection, 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, Moments and their Importance, 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.

### Unit-II

**Probability:** Basic concepts, deterministic and random experiments, trial, outcome, sample space, event, operations on events, mutually exclusive and exhaustive events, equally likely and favourable events, 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'(≥2) events, Boole's inequality and Bayes' theorem, Problems on applications of Bayes' theorem.

### Unit-III

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

### Unit-IV

**Mathematical Expectation:** Expectation of random variable, a function of a random variable, Raw and Central moments, Covariance using mathematical expectation (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 their properties, Chebyshev's and Cauchy-Schwartz's inequalities and their applications.

**References:**


1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. M. Jagan Mohan Rao and Papa Rao: A Text book of Statistics (Paper-I).
3. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan , New Delhi.
4. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC, PHI


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# *Practical-1*

# Descriptive Statistics and Probability

(3 HPW :: 1 Credit :: 25 Marks)

## **Part-1** (Using Calculator)

1. Graphical presentation of data (Histogram, frequency polygon, Ogives). s
2. Diagrammatic presentation of data (Bar and Pie).
3. Computation of non-central and central moments – Sheppard□s corrections for grouped data.
4. Computation of coefficients of Skewness and Kurtosis □ Karl Pearson's, Bowley's, $\beta_1$ and $\beta_2$.

## **Part-2** (Using MS-Excel)

1. Basics of Excel- data entry, editing and saving, establishing and copying formulae, built in Functions in excel, copy and paste and exporting to MS word document.
2. Graphical presentation of data (Histogram, frequency polygon, Ogives) using MS-Excel
3. Diagrammatic presentation of data (Bar and Pie) using MS-Excel
4. Computation of Measures of central tendency, dispersion, Coefficient of Variation and coefficients of Skewness, Kurtosis using MS-Excel.

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# Question Papers Pattern

**(A) Final Examination:** KAKATIYA UNIVERSITY

**B.Sc. (STATISTICS)**

**Theory Question Paper Pattern**

**Academic Years: 2019-2022**

Time: 3 hours] [Max. Marks: 80

## Section - A

**Answer ALL questions. All questions carry equal marks. (4Qx12m=48)**

Q1. (a)

[OR] From Unit-I

Q1. (b)

Q2. (a)

[OR] From Unit-II

Q2. (b)

Q3. (a)

[OR] From Unit-III

Q3. (b)

Q4. (a)

[OR] From Unit-IV

Q4. (b)

## Section - B

**Answer any EIGHT questions. All questions carry equal marks. (8Qx4m=32)**

Q5, Q6, Q7 — From Unit-I

Q8, Q9, Q10 — From Unit-II

Q11, Q12, Q13 — From Unit-III

Q14, Q15, Q16 — From Unit-IV

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KAKATIYA UNIVERSITY

**B.Sc. (STATISTICS)**

**Practical Question Paper Pattern**
**Academic Years: 2019-2022**

**Time: 2 hours]** **[Max. Marks: 25**

**[Practical:15, Record:5, Viva:5]**

**Note: Solve any THREE problems choosing at least one from each Section**

**Section-A** (Solve Using Calculator)

Problem. 1
Problem. 2 } From Part-I of Question Bank
Problem. 3

**Section - B** (Solve Using Computer Programs)

Problem. 4 } From Part-2 of Question Bank
Problem. 5

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**(B) Internal Examinations:**

1 Two Internal exams are to be conducted and best of two internal marks is considered.
2 First internal exam is to be conducted after completion of Unit-I &II.
3 Second internal exam is to be conducted after completion of Unit-III & IV.
4 Internal Examination duration: 1 hr 30 min.
5 Internal Theory QP consists of 20 marks.
6 10 Short questions are to be given (5Q from each of 2 Completed units).
7 All TEN questions are to be answered (10QX2m=20m).

**Prof A Rajendra Prasad**
**Chairperson, BOS in Statistics, KU**