KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS AY: 2020-2021 on words)
B.Sc. STATISTICS
II Year: Semester-III

DSC-3/Paper-3: STATISTICAL METHODS AND THEORY OF ESTIMATION

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

Unit-I

Bi-variate data, Scattered diagram, Principle of least squares, fitting of straight line, quadratic and power curves. Concept of correlation, computation of Karl-Pearson correlation coefficient for grouped and ungrouped data and its properties, Correlation ratio, Spearman's rank correlation coefficient and its properties. Simple linear regression, correlation verses regression, properties of regression coefficients, their relation with correlation coefficient.

Unit-II

Concepts of partial and multiple correlation coefficients (only for three variables), Analysis of categorical data, their independence, Association and partial association of attributes, various measures of association, Yule's for two way data, coefficient of contingency (Pearson and Tcherprow), coefficient of colligation**.**

Unit-III

Concepts of Population, Parameter, Random sample, Statistic, Sampling distribution and Standard error, Standard error of sample means and that of sample proportions, Exact sampling distributions: Statement and properties of χ^2, t and F distributions and their inter-relationships. Independence of sample mean and variance in random sampling from normal distribution.
Point estimation of a parameter, concept of bias and mean square error of an estimate. Criteria of a good estimator: consistency, unbiasedness, efficiency and sufficiency with examples.

Unit – IV

Statement of Neyman's Factorization theorem, derivations of sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one parameter only) distributions, Estimation by the method of moments(MOM), Maximum likelihood estimation (MLE), Asymptotic properties of MLE (Statements without proofs), Concept of interval estimation, Confidence intervals of the parameters of normal population by Pivot method.

References:

1. Goon AM, Gupta MK, Das Gupta B : Outlines of Statistics , Vol-II,

   The World Press Pvt. Ltd., Kolkata.

2. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics,

    Sultan Chand & Sons, New Delhi.

3. Hogg and Craig : Introduction to Mathematical statistics. Prentice Hall

4. Parimal Mukhopadhyay : Mathematical Statistics, New Central Book agency.

5. V. K. Rohatgi and A. K. Md. Ehsanes Saleh : An introduction to probability and statistics, Wiley series.

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Under Graduate Courses (Under CBCS AY: 2020-2021 on words)
B.Sc. STATISTICS
II Year: Semester-III

Practical-3: *STATISTICAL METHODS AND THEORY OF ESTIMATION*
(3 HPW, Credits 1 and Marks 25)

Part-A (Using Calculator)

1. Generation of random samples from Uniform (0,1), Uniform (a,b), Normal and Poisson and Exponential Distributions.

2. Fitting of straight line and parabola by the method of least squares.

3. Fitting of power curves of the type $y = a x^b$, $y = a b^x$ and $y = a e^{bx}$ by the method of least squares.

4. Computation of Yule's coefficient of association and Pearson's, Tcherprows coefficient of contingency.

5. Computation of correlation coefficient and regression lines for ungrouped data.

6. Computation of correlation coefficient, forming regression lines for ungrouped data.

7. Computation of correlation coefficient, forming regression lines for grouped data.

8. Computation of multiple and partial correlation coefficients.

9. Computation of correlation ratio

Part-B (Using MS-Excel)

10. Simulation of random samples from Uniform (0,1), Uniform (a,b), Exponential, Normal and Poisson distributions using MS Excel.

11. Fitting of straight line and parabola by the method of least squares using MS Excel.

12. Fitting of power curves of the type $y = a x^b$, $y = a b^x$ and $y = a e^{bx}$ by the method of least squares using MS Excel.

13. Computation of correlation coefficient, forming regression lines using MS Excel.

14. Computation of multiple and partial correlation coefficients 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   From Unit-I
Q7

Q8
Q9   From Unit-II
Q10

Q11
Q12   From Unit-III
Q13

Q14
Q15   From Unit-IV
Q16

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KAKATIYA UNIVERSITY

B.Sc. (STATISTICS)

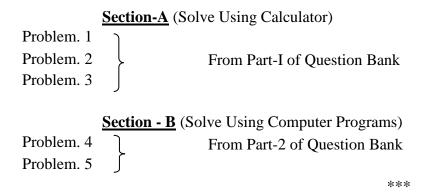**Practical Question Paper Pattern**
Academic Years: 2019-2022

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