DIPLOMA IN STATISTICAL ANALYSIS AND RESEARCH METHODOLOGY

SEMESTER II

SARM 6: STATISTICAL INFERENCE

Max. Marks: 100

External: 70

Internal: 30

Pass: 40%

Credits: 6

Course Outcomes (COs)

After completing this course, students will be able to:

CO1. Explain the concepts of point and interval estimation and their significance in statistical inference.

CO2. Apply small sample tests (t-tests) for testing hypotheses related to means and paired observations.

CO3. Conduct large sample tests for proportions and differences in proportions to draw meaningful conclusions.

CO4. Use F-statistics and Chi-square tests to analyze variances and test the independence or goodness of fit of data.

CO5. Perform Analysis of Variance (ANOVA) and present statistical findings through effective interpretation and report writing.

Course Specific Outcomes (CSOs)

By the end of the course, students will specifically be able to:

CSO1. Distinguish between point and interval estimation and apply them for population parameter estimation.

CSO2. Conduct and interpret various t-tests for single mean, difference of means, and paired data in small samples.

CSO3. Perform hypothesis testing for proportions in large samples to evaluate real-world data scenarios.

CSO4. Apply F-test and Chi-square test techniques for testing equality of variances,

independence of attributes, and model adequacy.
CSO5. Implement one-way and two-way ANOVA to analyze group differences and prepare comprehensive research reports based on statistical results.

INSTRUCTIONS FOR THE PAPER SETTER/ EXAMINER:

1. The syllabus prescribed should be strictly adhered to.
2. The Question Paper will have 70 Multiple Choice questions (MCQs) and four choices of answers will be there covering the entire syllabus. Each question will carry 1 mark. All questions will be compulsory; hence candidates will attempt all the questions.
3. Paper-setters/Examiners are requested to distribute the questions from Section A and Section B of the syllabus equally i.e., 35 questions from Section A and 35 questions from Section B.
4. The examiner shall give clear instructions to the candidates to attempt questions.
5. The duration of each paper will be two hours.

INSTRUCTIONS FOR THE STUDENTS

The question paper shall consist of 70 Multiple-choice questions. All questions will be compulsory and each question will carry 1 mark. There will be no negative marking. Students are required to answer using OMR (Optimal Mark Recognition) sheets.

SECTION A

Unit 1: Theory of Estimation: Point estimation and Interval estimation

Unit 2: Sampling distributions of a Statistics- Small Sample test or student-t test and its applications: t-test for single mean, difference of means, Paired t-test

Unit 3: Large Sample test: Introduction, Sampling of Attributes- test for Single Proportion, test for difference in proportion

SECTION B

Unit 4: F-statistics: meaning, equity of population variances

Unit 5: Chi-square test- goodness of fit, independent of attributes, test of variance (for population), equality of several population proportions

Unit 6: Analysis of Variance: One-way and Two-way

Unit 7: Interpretation of data and Report writing.

Note: Statistical analysis should also be taught with the help of MS Excel, SPSS or any other related software tool.

Suggested Readings

A.M Goon, M.K. Gupta and B. Dasgupta, Fundamentals of Statistics, Vol-I, World Press, Calcutta.

- Anderson, D.R.; Sweeney, D.J. and Williams, T.A., "Statistics for Business andEconomics", 2nd edition (2011), Thompson, New Delhi.
- Cooper, D. R., and Schindler, P.S., "Business Research Methods", 9th Edition,Tata McGraw-Hill, New Delhi.
- Gupta SC: Fundamentals of statistics, S. Chand & Company. New Delhi
- Gupta, SP: Statistical Methods, S. Chand & Company. New Delhi
- Lehmann, E.L. (1986): Testing Statistical hypotheses (Student Edition).
- Monga, GS: Mathematics and Statistics for Economics, Vikas Publishing House, New Delhi.
- Zacks, S. (1971): Theory of Statistical Inference, John Wiley and Sons. New York.