

**S.S. Jain Subodh P.G. College, Jaipur**

**M.Sc. (Statistics)**

**Paper Code: 24STA-9201T**

**Paper Name: Sampling Distributions**

**Assignment March 2025**

**Attempt four questions, selecting one from each unit.**

**Maximum Marks: 30**

**UNIT I**

Q.1) Define sampling distribution, parameter, statistic and standard error. What is Chi-Square Distribution and derive its p.d.f.

Q.2) Describe F-statistic and Non-central F-test.

**UNIT II**

Q.3) What is order statistic and their distributions.

Q.4) What is sampling distributions of range and median of univariate population.

**UNIT III**

Q.5) Define Bivariate distribution and its joint distribution.

Q.6) Write the marginal and conditional distributions of bivariate distribution.

**UNIT IV**

Q.7) Define correlation, regression and linear regression.

Q.8) What is correlation ratio and intra-class correlation.

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**M.Sc. (Statistics)**

**Paper Code: 24STA-9202T**

**Paper Name: Statistical Inference- I**

**Assignment March 2025**

**Attempt four questions, selecting one from each unit.**

**Maximum Marks: 30**

**UNIT-I**

Q.1) What is point estimation and write the criteria of a good estimator.

Q.2) State and prove Cramer-Rao Inequality.

**Unit - II**

Q.3) What are the procedure of hypothesis testing? Explain in detail.

Q.4) State and Prove Neyman Pearson Lemma.

**Unit – III**

Q.5) Explain in detail Sequential Probability Ratio Test (S.P.R.T)?

Q.6) Explain Wald Sequential Probability Ratio Test?

**Unit- IV**

Q.8) With the help of numerical explain the concept of median test and Run test.

Q.9) Write short notes on the following:

(i) Mann- Whitney U- test.

(ii) Kolmogorov- Smirnov test.

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**M.Sc. (Statistics)**

**Paper Code: 24STA-9203T**

**Paper Name: Design of Experiment-I**

**Assignment March 2025**

**Attempt four questions, selecting one from each unit.**

**Maximum Marks: 30**

**Unit I**

Q1. Discuss in detail the need for analysis of covariance. Also discuss in detail the analysis of covariance for a two-way classified design.

Q2. Write shot note on: a) Regression analysis b) Transformation of data.

**Unit II**

Q3. Explain the concept of linear model. Explain the i) fixed effect ii) random effect iii) mixed effect.

Also explain the basic principles of design of experiments.

Q4. Explain the Completely randomized design with merits and demerits. Give its analysis with ANOVA table.

**Unit III**

Q5. Explain the concept of main effect and interaction by taking  $2^2$  factorial experiments. Also give the analysis of  $2^2$  factorial experiment conducted in 5 replication of a randomized block design.

Q6. Explain the concept of confounding. Give the analysis of  $2^3$  factorial experiment in which AB, AC, BC and ABC are partially confounded in r replications.

**Unit IV**

Q7. Derive the analysis of balanced incomplete block design.

Q8. Explain Split Plot Design and its analysis.

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**M.Sc. (Statistics)**

**Paper Code: 24STA-9204T**

**Paper Name: Demography**

**Assignment March 2025**

**Attempt four questions, selecting one from each unit.**

**Maximum Marks: 30**

**Unit – I**

Q1 Discuss the sources of demographic data in India and also point out the uses and limitations of the data.

Q2 Discuss demographic profiles of the Indian Census.

**Unit – II**

Q3 What do you mean by fertility? Define crude birth rate, general fertility rate, specific fertility rate, and age specific fertility rate. How are these rates computed in practise?

Q4 Discuss various death rates and their utility in study of population growth.

**Unit - III**

Q5 Explain the uses of life table. State the general procedure and steps for the construction of life tables.

Q6 Explain the stationary and stable population models. Discuss the situation when stationary and stable populations are identical. Explain King's method.

**Unit - IV**

Q7 Discuss causes of migration in detail. Write note on Makheham and Gompertz curve.

Q8 Discuss in detail the fitting of logistic curve method after listing the various method of population projection.