



पंडित दीनदयाल उपाध्याय शेखावाटी  
विश्वविद्यालय सीकर

**SYLLABUS**

**B.A. PART-II**

**EXAMINATION-2024**

STATISTICS

**20. STATISTICS****Marks Scheme**

| Paper        | Nomenclature                                     | Marks      |            |
|--------------|--|------------|------------|
|              |  | Science    | Arts       |
| Paper I      | Statistical Inference                            | 50 mark    | 65 marks   |
| Paper II     | Statistical Applications in Society and Industry | 50 mark    | 65 marks   |
| Paper III    | Practical based on Paper I, II                   | 50 mark    | 70 marks   |
| <b>Total</b> |  | <b>150</b> | <b>200</b> |

**Note:** In each Question paper, 10 (ten) questions will be set having 2 (Two) from each unit. Candidates have to answer five questions in all, taking not more than one from each unit.

**Paper I****(Statistical Inference)****Unit-I**

Sampling from a distribution : Concept of statistic and its sampling distribution. Sampling distribution for mean of Binomial, Poisson and Normal Distribution; Chi-square Distribution: Definition, Derivation, Moments, M.G.F., C.G.F., Mode & Skewness Limiting and Additive Property. Distribution of ratio of Chi-square variates.

- X Testing Normal Population variance, Test for Goodness of fit, Contingency table & Independence of attributes, Yates's correction 18 hours

#### Unit-II

t-Distribution: Definition of Student's t & Fisher's t Statistic and derivations of their distributions, Constants, Limiting Property of 't' distribution. Applications-Testing of Single mean: Difference of two means; paired t test and sample correlation coefficient. F-Distribution: Definition, Derivation, Constants, Application- Testing of equality of two variances. Relationship between t, F and Chi-square Distributions. 18 hours

#### Unit-III

Theory of Estimation: Point Estimation-Concept and Problem for Point Estimation; Criterion of a good estimator (Unbiasedness, Consistency, Efficiency, Sufficiency). MVUE. Method of moments Methods of Maximum Likelihood Interval Estimation-Concept, Confidence Interval, Confidence Coefficient; Construction of Confidence Interval for Population Mean, Variance; Difference of Population Means & Ratio of Variances of Normal Distributions. 18 hours

#### Unit-IV

Testing of Hypothesis: Simple, Composite, Null and Alternative Hypothesis. Types of error, Critical region BCR, Neyman-Pearson's Lemma for BCR. BCR in case of Binomial, Poisson, Normal and Exponential Population. 18 hours

#### Unit-V

Large sample tests: Testing of single mean, proportion. Testing of difference of means and proportions. Non-Parametric Tests-Definition, Merits & Limitations. Sign test one sample and two sample tests. Run Test; Median test. 18 hours

#### REFERENCES:

1. Ghosh A.M. Gupta M.K., Das Gupta B. (1991): Fundamentals of Mathematical Statistics, Vol.1, World Press, Calcutta
2. Hodges J.L. and Lehman E.L. (1964): Basic Concepts of Probability and Statistics, Holden Day.
3. Mood A.M., Graybill F.A. and Boes D.C. (1974): Introduction to the Theory of Statistics, McGraw Hill.
4. McGraw Hill

proof) Applications: Testing Normal Population variance, Test for Goodness of fit; Contingency Table & Independence of attributes. Yates's correction. 18 hours

#### Unit-II

t-Distribution: Definition of Student's -t & Fisher's -t Statistic. Property and Applications of t-distribution for testing-Single mean, difference of two means, observed sample correlation coefficient Paired t-test., F-Distribution: Definition, Mean, Variance & mode. Application of F distribution- Testing of equality of two variances. Relationship between t, F and Chi-square Distributions. without proof. 18 hours

#### Unit-III

Theory of Estimation: Point Estimation- Problems for Point Estimation; Criterion of a good estimator (Unbiasedness, Consistency, Efficiency, Sufficiency). MVUE. Method of moments. Methods of Maximum likelihood Interval Estimation-. Confidence Interval for mean, variance, difference of means and ratio of variances for normal populations. 18 hours

#### Unit-IV

Testing of Hypothesis: Simple, Composite, Null and Alternative Hypothesis. Types of error, Critical region, BCR, Neyman-Person's Lemma (statement only) and its application, BCR in case of Binomial, Poisson, and Normal Population. 18 hours

#### Unit-V

Large sample test-Testing of single mean, proportion. Testing of difference of means and proportions. Non-Parametric Tests-Definition, Merits & Limitations. Sign-test for one sample and two sample cases, Run Test, Median test. 18 hours

#### REFERENCES:

1. Goon A.M Gupta M.K., Das Gupta B.(1991): Fundamentals of Statistics, Vol.I. World Press, Calcutta.
2. Hodges J.L. and Lehman E.L.(1964): Basic Concepts of Probability and statistics, Holden Day
3. Mood A.M., Graybill F.A; and Boes D.C. (1974): Introduction to the Theory of Statistics, Mc Graw Hill
4. Freund J.E. (2001): Mathematical Statistics, Prentice Hall of India.
5. S.C. Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand and sons, New Delhi

University of Rajasthan

**ADDITIONAL REFERENCES:**

1. Bhaft B.R. Srivenkâtrama. T and Rao Madhava K.S. (1967):  
Statistics: A Beginner's Text. Vol.II New Age International (P)  
Ltd.
2. Rohatgi V.K. (1967): An Introduction to Probability, Theory and  
Mathematical Statistics, John Wiley & Sons.
3. Snedecor G.W. and Cochran W.G. (1967): Statistical Methods.  
Iowa State University Press.
4. E.J. Dudewicz & S.N. Misra: Modern Mathematical Statistics  
John Wiley and Sons.

**Subject : Applied Statistics**

Paper I

Paper II

**STATISTICAL APPLICATIONS IN SOCIETY AND INDUSTRY**

Course contents are same as that of subject statistics.

PAPER II

PAPER III

**Practical Paper**

Course contents