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Statistics Syllabus for Uttarakhand State Civil
Services Main Exam-2011

STATISTICS

PAPER-I

Probability Theory and Statistical Applications

Group A - Probability Theory.

Sample Space and Events, Classical and Axiomatic Definitions of Probability, Properties of Probability Measure, Conditional Probability, Independence of Events, Bayes' Theorem and its Applications

Random Variable and its Distribution Function, Elementary Properties of Distribution Function, Discrete and continuous Random Variables, Bivariate Distribution and Associated Marginal and Conditional Distributions.

Expectation, Moments, Moment Generating and Characteristic Functions, Markov and Chebyshev Inequalities, convergence in Probability, Weak Law of Large Numbers and Central Limit Theorem for Independently and Identically distributed Random Variables.

Some Standard Discrete and Continuous Distributions, viz., Binomial, Poisson, Hypergeometric, Geometric, Negative Binomial, Multinomial, Uniform, Normal, Exponential, Gamma, Beta and Cauchy, Bivariate Normal Distribution.

Group B - Statistical Applications

Linear Regression and Correlation, Product Moment Correlation, Rank Correlation, Intra-Class Correlation and Correlation Ratio, Multiple and Partial Correlation and Regression for Three Variables.

Principles of Experimental Design, One-way and Two-way Analysis of Variance with Equal Number of Observations per Cell, Completely Randomized Design, Randomized Block Design, Latin Square Design, 2^2 and 2^3 Factorial Experiments, Missing Plot Technique.

Sources of Demographic Data, Stable and Stationary Populations, Measures of Fertility and Mortality, Life Tables, Simple Population Growth Models and Population Projection Techniques.

Index Numbers and their Uses, Index Numbers due to Laspeyre, Paasche, Marshall-Edgeworth and Fisher, Tests for Index Numbers, Construction of Price Index Number and Cost-of Living Index Number.

Time Series and its Components, Determination of Trend and Seasonal Indices, Periodogram and Correlogram Analysis, Variate Difference Method.

PAPER-II

Statistical Inference and Management

Group A - Statistical Inference

Properties of Estimators, Consistency, Unbiasedness, Efficiency, Sufficiency and Completeness, Cramer-Rao Bound, Minimum Variance Unbiased Estimation, Rao-Blackwell Theorem.

Estimation Procedures, Method of Moments and Method of Maximum Likelihood, Properties of Estimators, Interval Estimation.

Simple and Composite Hypothesis, Two Kinds of Errors, Critical Region, Level of Significance, Size and Power function, Unbiased Tests, Most Powerful and Uniformly Most Powerful Tests, Neyman-Pearson Lemma and its applications, Likelihood Ratio Tests.

Tests based on t , x^2 , z and F - distributions, Large Sample Tests, Variance Stabilizing Transformations.

Distributions of Order Statistics and Range, Non-parametric Tests, viz., Sign Test, Median Test, Run Test, Wilcoxon-Mann-Whitney Test.

Group B - Statistical Management

Nature of Operations Research Problems, Linear Programming Problem and the Graphical Solution in simple Cases, Simplex Method, Dual of Linear Programming Problem, Allocation and Transportation Problems.

Zero-sum two-person game, Pure and Mixed Strategies, Value of a Game, Fundamental Theorem, Solution of 2x2 Games.

Nature and Scope of Sample Survey, Sampling vs. Complete Enumeration, Simple Random Sampling from Finite Populations with and Without replacement, Stratified Sampling and Allocation Principles, Cluster Sampling with Equal Cluster Size. Ratio, Product and Regression Methods of Estimation and Double Sampling, Two Stage Sampling with Equal First Stage Units, Systematic Sampling.

Statistical Quality Control, Control Charts for Variable and Attributes - $\bar{X}$ - R (X, R), $\bar{X}$ - σ (X, σ), p, np and C Charts.

Acceptance Sampling, OC, ASN and ATI Curves, Producer's risk and Consumer's risk, Concept of AQL, AOQL and LTPD, Single and Double Sampling Plans.

Scaling Procedures, Scaling of Test Items, Test Scores, Qualitative Judgements, Theory of Tests, Parallel Tests, True Score, Reliability and Validity of Tests.