# ENTRANCE TEST SYLLABUS FOR PG COURSE IN STATISTICS

### UNIT-I

**Descriptive Statistics (Univariate):** Arithmetic mean Median, Mode. Geometric Mean and Harmonic Mean, Fractiles, Quartiles, Deciles, Percentiles,: Range, Mean Deviation, Absolute Deviation, Standard Deviation, Quartile Deviation, Coefficient of range, coefficient of mean deviation, coefficient of quartile deviation and coefficient of variation, Skewness and Kurtosis.

Descriptive Statistics (Bivariate): Principles of least squares, curve fitting, Correlation, Karl-Pearson's Correlation Coefficient, Rank correlation, Regression analysis, Multiple and Partial correlations.

#### UNIT-II

**Probability Theory:** Random experiment, Probability Independence of Events, Conditional Probability, Total and Compound Probability theorems, Bayes theorem, Probability Mass Function, Probability density function, Expectation of a random variable, Moments, Moment generating function.

Analysis of Variance and Design of Experiment: Analysis of Variance, One way classification, Two way classification with one observation per cell, Design of Experiment.

### UNIT-III

**Estimation Theory and Sampling Survey:** Method of Maximum Likelihood, Method of minimum Chi-square, methods of moments for estimation of parameters. Cramer-Rao inequality, Interval Estimation, Confidence Interval and Confidence limits. Sampling vs. Complete enumeration Sampling units and Sampling frame, Simple Random sampling with and without replacement, Stratified random sampling, allocation methods.

**Testing of Hypothesis and Applied Statistics:** Statistical Hypothesis, Testing of hypothesis, Type –I and Type – II errors, Significance level, p-values, Power of a test, Small sample tests based on chi-square, t, F and Z distributions,

#### UNIT-IV

**Probability Distributions:** Discrete Probability Distributions: Bernoulii, Binomial distribution, Poisson distribution, Continuous Probability Distributions: Exponential, Gamma, Beta distributions, Cauchy, Laplace, Pareto, Weibull, Log normal, Normal distribution.

**Statistical Computing:** Introduction to R Programming, Installing R, Creating a data set, Error in numerical computations, Calculus of finite differences, interpolation, solutions of algebraic and transcendental equations, Numerical differentiation and integration, Numerical solution of ordinary differential equation.

## UNIT-V

Statistical Methods: Time Series, Index number, Statistical Quality Control. Order Statistics, Distribution of minimum, distribution of Sample Median and Range, Estimation of parameters in k variable linear Regression model,

**Operations Research:** Linear programming problem. Simplex method, Big-M and Two-Phase method, Concept of duality, Convex sets, Convex and concave functions, Transportation and Assignment problem, Game Theory.