STATISTICS

CODE-25

PAPER-I

(i) Probability: Classical and Statistical definitions of probability, Simple theorem on probability with examples. Conditional probability and statistical independence Bayer theorem. Random variables- Discreet and continuous probability functions and probability density functions Probability distributions in doreor more varieties. Mathematical expectations Tech-byecheffs inequality Week-law of large number Simple form of central limit therorem.

(ii) Statistical methods- Compilation classification, tabulation and diagrammatic representation of various type of statisticals data.

Concepts of statistical population land frequency curbs, measures of central tendency and despertion . Moment and commulants, measures of skewness and Kurtosis. Moment-generating functions,study of standard probability distributions---Binomial passion. Hypergeometric normal Negative Binominal Rectangular and log normal distributions General description of the Presonian system of curves.

General properties of a bivariate distribution, bivariate normal distribution, measures of association and contingency. Correlation and linear regression involving two or more variables. Correlation ratio interclass correlation Bank correlation. Non-linear regression analysis.

Curve fitting by methods of free hand curves, moving averages, group averages, least squares and movements Orthogonal polynominals and their uses.

(iii) Sampling distribution and statistical inference---random sample, statistics concepts of sampling distribution and standard error.

Derivation of sampling distribution of mean of independent normal varieties. X^2-T and F statistics, their properties and uses. Derivation of sampling, distribution of sample means variances and correlation coefficient from a bivariate normal population.Derivation(in large samples) and uses Personian X^2.

Theory of Estimation--- Requirements of a good estimate/unbiasedness, consistency, efficiency and sufficiency Cramer-Rao bound to variance of estimates. Best linear unbiased estimates.

Methods of estimation, General description of the methods of moments, method of Maximum likelihood of least squares and methods of minimum X^2 properties of maximum likelihood estimators(without proof.).

Theory of confidence intervals, simple problems of setting confidence limits.

Paper-II

Theory of testing Hypotheses--- Simple and composite hypothesis, statistical test and critical regions. Two kinds of error, level of significance and power of tests.

Optimum critical regions for simple hypotheses concerning one parameter. Construction of such regions for simples hypotheses relating to normal population.

Likelihood ratio tests--- Tests involving mean, variance correlation and regaression co-officients in univariable and biveriate normal populations. Simple non-parametric tests—sign, runmedian, rank and rendomisation tests Sequential test of a simple hypotheses against a simple alternative (without derivation)

(i) Sempling techniques—sampling versus complete enumeration,Principle of sampling ,Frames and sampling units, Sampling and non-sampling errors. Simple random sampling, Stratified sampling, cluster sampling systematic sampling description of multi-stage and multiphase sampling ratio and regression, methods of estimation. Designing of simple surveys with reference to recent large-scale surveys in India.

(ii) Design of Experiments—Analysis of variance and coveriance with equal number of observation in "the cells" Transformation of variate to stabilize variance.

Principle of experimental designs, completely randomized, randomized block and Latin square designs. Missing plot techniques. Factorial experiments with confounding in 2s [s=2 (i) 51.3 and 3^3] designs. Split pot design Balanced incomplete designs and simples lattice.