STATISTICS

(**UG STANDARD**) **CODE NO:274**

UNIT I : Uses, Scope and limitation of Statistics, Collection, Classification and Tabulation of data, Diagramatic and Graphical representation, Measures of location, dispersion, Skewness and Kurtosis – Correlation and regression – Curve Fitting – Linear and Quadratic equation by the method of least squares.

UNIT II : Probability - Addition, Multiplication and Baye's Theorems and their application. Tchebychev's inequality. Random variables – Univariate and Bivariate – Probability distributions – Marginal and conditional distributions – Expectations – Moments and cumulants generating functions.

UNIT III : Probability distributions – Binomial, Poisson, Geometric and Hypergeometric. Continuous distributions – Uniform, exponential and normal. Sampling distributions and standard error, student's 't', Chi-square and F statistic – distributions and their applications.

UNIT IV : Estimation – Point estimation – properties of estimates Neyman – Fisher Factorization theorem(without proof) Cramer – Rao inequality, Rao – Blackwell theorem – MLE and method of Moments estimation – Interval estimation – for population mean and variance based on small and large samples.

UNIT V : Tests of Hypothesis – Null and Alternative – Types of errors – Power of test, Neyman – Pearson lemma, UMP and Likelihood ratio tests, Test procedures for large and small samples – Independence of attributes, Chi-square test – Goodness of fit

UNIT VI : Simple random sample – stratified, systematic, Cluster (Single stage) Estimation of mean and variance in SKS – Sample Survey – Organisation – CSO and NSSO – Sampling and Non-Sampling errors.

Analysis of Variance – Principles of design CRD, RBD and LSD – Factorial experiments 2^2, 2^3 and 3^2 (Without confounding) Missing plot techniques.

UNIT VII : Concept of SQC – Control Charts – $\overline{X}$, R, p and charts Acceptance sampling plan – single and double – OC curves Attributes and Variables plan.

OR Models – Linear Programming problems – Simplex method Dual – Primal, Assignment problems, Net work – CPM and PERT

UNIT VIII : Time series – Different components – Trend and Seasonal Variations – Determination and elimination

UNIT IX : Index Numbers – Construction and uses – Different kinds of simple and weighted index numbers – Reversal tests – construction and use of cost of living index numbers – Birth and death rates – Crude and standard death rates, Fertility rates – Life table construction and uses.

UNIT X : Statistical Computing using Excel – Understanding on the usage of Statistical Packages including SPSS, MINITAB and SAS.