UNIT-1

Probability: Mathematical and Statistical definitions and problems, Marginal probability, Random variables, discrete and continuous random variables, Mathematical Expectation, Moments, Central moments, Kurtosis.

UNIT-2

Important Theoretical Distributions: Review of continuous and discrete probability distributions, Negative binomial distribution, Fitting of standard distributions, Fitting of Normal distribution by method of areas and method of ordinates, Hypergeometric distributions, Multinomial distribution, Rectangular distribution, Beta distribution of first and second kind, Gamma distribution, Cauchy's distribution, Geometrical probability, Tchebycheff's and Markov's inequalities.

UNIT-3

MGF and Method of Least Square: Change of origin and scale in MGF, moment generating functions of standard distributions (Poisson, Binomial, Exponential, Uniform, Normal, Gamma, chi square), Cumulants, characteristic function, Weak law of large numbers, Central limit theorem. Method of least squares: Fitting of straight lines, parabola and exponential curves.

UNIT-4

Simple sampling of attributes: Large samples, mean and S. D. in simple sampling of attributes, Test of significance for large samples, Standard error, Type I and II errors, Null hypothesis, Confidence limits, Chi-square distribution, Degree of freedom, Level of significance, Test of goodness of fit, Test of independence, Coefficient of contingency, Yate's correction for continuity.

UNIT-5

Sampling of variables and Inference: Small samples, t-distribution, test of significance of the mean of random sample from normal population, F-distribution, Relationship between t, F and chi square distributions, Inference: Point estimation, interval estimation, properties of good estimator, Maximum likelihood parameter.