

**ALLIED PAPER II : MATHEMATICAL STATISTICS**

**Unit I**

Various measures of central tendency (Mean, Median, mode, Geometric mean and Harmonic mean) and their properties merits and demerits. Various measures of dispersion (mean, deviation, quartile deviation and standard deviation) and their merits and demerits and properties, Axiomatic probability and classical probability – addition, multiplication and Baye's theorems – simple problems

**Unit II**

Random variables and probability distributions – probability function – probability density function – cumulative distribution function – their properties, mathematical expectation, Bivariate distribution – discrete and continuous marginal and conditional distribution, statistical independence, conditional expectation

**Unit III**

Binomial, Poisson distributions – Probability generation function  $\{P(x=2)\}$  – moment generating function  $[M_x(t)]$  cumulant generating function  $[K_x(t)]$  Normal distribution constants – moment generating function – limiting form of Binomial and Poisson distributions

**Unit IV**

Continuous distributions – rectangular, exponential, beta, gamma, student's-t, 'F' and chi-square distributions – constants test of significance for large samples and small samples – 't' – test, F-test and chi-square test of goodness of fit

**Unit V**

Correlation – rank correlation – Karl Pearson's correlation coefficient and its properties, Linear regression and its properties – point estimation – properties of good estimator, method moments and maximum likelihood estimation, properties of these two methods.

**Reference Books:**

Elements of Mathematical statistics by S.C. Gupta & V.K. Kapoor