BCA- S304B: Numerical and Statistical Methods

UNIT-I

Roots of Equations: Graphical Method -Bisection Method - False-Position Method - Fixed-Point Iteration - Newton-Raphson Method Secant Method - Roots of Polynomials: Conventional Methods - Muller's Method - Bairstow's Method. Algebraic Equations: Gauss Elimination -Gauss-Jordan - LU Decomposition - Matrix Inverse -Gauss-Seidel.

UNIT-II

Numerical Differentiation - Integration: Trapezoidal Rule - Simpson's Rule - Romberg Integration - Differential equations: Taylor's method - Euler's method -Runge-Kutta 2nd and 4th order methods Predictor - corrector methods.

UNIT-III

Diagrammatic and Graphical representation of Numerical Data - Formation of frequency distribution - Histogram, Cumulative Frequency - Polygon and Ogives - Measures of central tendencies - Mean, Median, Mode - Measures of dispersion - Mean deviation, Standard deviation, variance, Quartile deviation and coefficient of variation - Moments (upto 4th) - Measures of Skewness and Kurtosis for grouped and ungrouped data.

UNIT-IV

Sample space - Events - Definition of probability - combinatorial problems - conditional probability and independence - Random variables, distributions and Mathematical expectations - Discrete distributions - Binomial - Poisson - Continuous distributions - Normal and Exponential distributions - Moments and Moment generating functions.

UNIT-V

Correlation and Regression analysis: product moment correlation -coefficient - rank correlation coefficient - simple regression - method of least squares for estimation of regression coefficient. Concept of sampling and Sampling distributions - Sampling from Normal distributions - Standard error - Tests of significance - Large sample test for population mean and proportions - Test for populations means: single - two sample and paired t - test - Chi square tests for goodness of fit and test for independence of attributes in contingency table.

Recommended Books:

1. Snedecor G.W. and Cochran W.G. (1989): Statistical methods, 8 ed., Affiliated East West.
2. Trivedi K.S. (1994): Probability and Statistics with Reliability, Queueing and computer Science applications, Prentice Hall of India.
3. Balaguruswamy E. (1988): Computer oriented Statistical and Numerical methods, Macmillan India Ltd.
4. S. C. Chopra and R. P.Canale - Numerical Methods for Engineers - Third Edition - McGraw Hill International Edition - 1998.
5. S. S. Sastri, Introductory Methods of Numerical Analysis, Prentice Hall