Paper Code: BCA 202
Paper ID: 20202 **L T C**
Paper: Mathematics – IV **3 1 4**

Aim: To understand the basics concepts of probability and numerical analysis.

Objectives:

- To get the Knowledge about mathematical probability.
- To get familiar with various numerical techniques.

	INSTRUCTIONS TO PAPER SETTERS: Maximum Marks : 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

UNIT-I

COMBINATORICS: Permutation and Combination, Repetition and Constrained Repetition, Binomial Coefficients, Binomial Theorem.

PROBABILITY: Definition of Probability, Conditional Probability, Baye's Theorem.

[No. of Hrs: 11]

UNIT – II

PROBABILITY DISTRIBUTIONS: Review of Mean & Standard Deviation, Mathematical Expectation, Moments, Moment Generating Functions, Binomial, Poisson and Normal Distributions. **[No. of Hrs: 10]**

UNIT-III

INTERPOLATION: Operators: Shift, Forward Difference, Backward Difference Operators and their Inter-relation, Interpolation Formulae-Newton's Forward, Backward and Divided Difference Formulae: Lagrange's Formula.

SOLUTION OF NON LINEAR EQUATION: Bisection Method, False Position Method, Newton – Raphson Method for Solving Equation Involving One Variable only.

[No. of Hrs: 12]

UNIT – IV

SOLUTION OF LINEAR SIMULTANEOUS EQUATIONS: Gaussian Elimination Method with and without Row Interchange: LU Decomposition: Gauss - Jacobi and Gauss-Seidel Method; Gauss – Jordan Method and to find Inverse of a Matrix by this Method.

NUMERICAL DIFFERENTIATION- First and Second Order Derivatives at Tabular and Non-Tabular Points, Numerical Integration, Trapezoidal Rule, Simpsons 1/3 Rule: Error in Each Formula (without proof).

[No. of Hrs: 11]

TEXT BOOKS:

[T1] S.S. Sastry, " Numerical Analysis"; Prentice Hall of India, 1998.
[T2] Meyer, P.L.. Introductory Probability and Statistical Applications, Oxford (1970) 2nd ed.
[T3] Johnson, R., Miller, I. and Freunds, J., Miller and Freund's "Probability and Statistics for Engineers, Pearson Education(2005) 7th ed.

REFERENCE BOOKS:

[R1] Mathew, J.H., Numerical Methods for Mathematics, Science and Engineering, Prentice Hall Inc.J (2002).
[R2]Walpole, Ronald E., Myers, Raymond H., Myers, Sharon L. and, Keying Ye, Probability and Statistics for Engineers and Scientists, Pearson Education (2007) 8th ed.