# Paper I:  Algebra I

## I. Mathematical Logic.

Recapitulation of Mathematical Reasoning, Open sentences, compound open sentences, Quantifier, universal Quantifier, Existential quantifier and negation of a quantifier statement. Rule of inference and proofs, Methods of proof.                                        **12 Hrs**

## II. Theory of Equations.

Relation between the roots and coefficients of general polynomial equation in one variable, Transformations of equations. Descartes rule of signs. Solution of cubic equation by Cordon's methods. Biquadratic equation.                                        **15 Hrs**

## III. Matrices.

Recapitulation of matrix algebra (Basic concepts), rank of matrix, elementary operations, equivalent matrices, invariance of rank under elementary operations, inverse of a non- singular matrix by elementary operations. System of m-linear equations in n unknowns, matrices associated with linear equation, criterion for existence of non-trivial solution of homogeneous and non-homogeneous system, criterion for uniqueness of solutions. Eigen values and Eigen vectors of square matrix- Cayley-Hamilton theorem - Applications.                                        **25 Hrs**

## Note: Internal mark: 25

**References:**

1. F.J. Noronha et al: Introduction to mathematical logic (Bangalore University Publication).

2. Rudraiah et al: College Mathematics Vol-I (Sapna Book House, Bangalore)

3.  Schaum's outline of theory and problems of matrices by Frank Ayres (Schaum's Outline Series).

4. TEXTBOOK OF MATRIX ALGEBRA BY SUDDHENDU BISWAS

   ( PHI Learning Pvt. Ltd. Copyright. )

5. Uspenskey: Theory of equations.

6. C.C. Macduff's: Theory of equations (John Wiley).