

**ASSOCIATE DEGREE IN ARTS**

**MATHEMATICS (OPTIONAL)**

**(Outlines of Course)**

**Paper: (Algebra  $\frac{1}{2}$  and Calculus  $\frac{1}{2}$ )**

**Marks = 100**

**i) Algebra ( $\frac{1}{2}$ )**

Introduction to Number System, Algebra of Matrices and determinants of order  $2 \times 2$ ,  $3 \times 3$ , Addition, subtraction of matrices, scalar multiplication and multiplication of matrices, singular and non-singular matrices, adjoint and inverse of matrices.

Solution of equations by using matrices and Cramer's Rule.

**Determinants:**

Minor and co-factor of an element of a matrix in its determinants. Determinant of a square matrix of order  $2 \times 2$  and  $3 \times 3$  properties of determinants.

**Quadratic Equations:**

Some polynomial functions, Remainder and Factor Theorem, Synthetic Division, Relation between Roots and co-efficients of a quadratic equation. System of two equations involving two variables. Arithmetic, Geometric and harmonic sequences. Arithmetic Series, Geometric Series, Infinite Geometric Series.

**Trigonometry:**

Fundamentals of Trigonometry and Trigonometric identities.

**ii) Calculus and Analytic Geometry ( $\frac{1}{2}$ )**

Limit, Continuity (Simple Cases), Differentiation and Integration (Simple Cases), Differential equations (Variables separable). Introduction of a vector. Simple cases of dot and cross product of vectors.

**Note:**

Mathematics (Optional) means Mathematics General (Optional), A-Course of Mathematics (Optional) or B-Course of Mathematics (Optional).