



# Syllabus

PANJAB UNIVERSITY, CHANDIGARH

B.A./B.Sc. Sem. I

## Paper III : TRIGONOMETRY AND MATRICES

Max. Marks : 50

Theory : 45 marks

Internal Assessment : 05 marks

Time : 3 hrs.

- Note :**
1. The syllabus has been split into two Units : Unit-I and Unit-II. Four questions will be set from each Unit.
  2. A student will be asked to attempt five questions selecting at least two questions from each Unit. Each question will carry 9 marks.
  3. The teaching time shall be five periods (45 minutes each) per paper per week including tutorial.
  4. If internal assessment is to be conducted in the form of written examinations, then there will be only one written examination per paper in a Semester.

### Unit - I

D'Moivre's theorem, application of D'Moivre's theorem including primitive  $n^{\text{th}}$  root of unity. Expansions of  $\sin n\theta$ ,  $\cos n\theta$ ,  $\sin^n \theta$ ,  $\cos^n \theta$  ( $n \in \mathbb{N}$ ). The exponential, logarithmic, direct and inverse circular and hyperbolic functions of a complex variable. Summation of series including Gregory Series.

### Unit - II

Hermitian and skew-hermitian matrices, linear dependence of row and column vectors, row rank, column rank and rank of a matrix and their equivalence. Theorems on consistency of a system of linear equations (both homogeneous and non-homogeneous). Eigen-values, eigen-vectors and characteristic equation of a matrix, Cayley-Hamilton theorem and its use in finding inverse of a matrix.