

CLASS - XII

SEMESTER – III

SUBJECT: MATHEMATICS (MATH)

FULL MARKS: 40

CONTACT HOURS: 100 Hours

COURSE CODE : THEORY

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT-I	RELATIONS AND FUNCTIONS	20	7
	1. Relations and Functions Types of relations: Reflexive, symmetric, transitive and equivalence relations. One-to-one and onto functions, composite functions, inverse of a function.	10	4
	2. Inverse Trigonometric Functions Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric functions.	10	3
UNIT- II	ALGEBRA	25	10
	1. Matrices Concept, notation, order, equality, types of matrices, zero matrix, identity matrix, transpose of a matrix, symmetric and skew-symmetric matrices. Addition, multiplication and scalar multiplication of matrices; properties of addition, multiplication and scalar multiplication. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices. Existence of non-zero matrices whose product is a zero matrix (restrict to square matrices of order 2). Invertible matrices and proof of the uniqueness of inverse (if it exists). (Here all matrices will have real entries).	15	6
	2. Determinants Determinant of a square matrix (upto 3×3 matrices), properties of determinants, minors, cofactors and application of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples. Solutions of system of linear equations in two or three variables (having unique solution) using inverse of a matrix.	10	4

UNIT No.	TOPICS	CONTACT HOURS	MARKS
UNIT-III	CALCULUS	38	15
	1. Continuity and Differentiability Concept of Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions, derivative of implicit functions, concept of exponential and logarithmic functions, Derivatives of logarithmic and exponential functions, Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.	20	8
	2. Application of Derivatives Application of derivatives, Rate of change of quantities, increasing and decreasing functions, tangents and normals, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems on basic principles and real life situations.	18	7
UNIT-IV	PROBABILITY	17	8
	Conditional Probability, Multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution. Mean and variance of a random variable.		