

SUBJECT: MATHEMATICS (MTH2)**CLASS XII****SEMESTER III****THEORY****FULL MARKS –40****(MCQ*** Type Question)**

UNIT	Topic	No of periods assigned	Marks
Unit - I	Inverse Trigonometric Function	08	5
Unit - II	Algebra	18	13
Unit - III	Calculus	30	16
Unit – IV	Probability	4	6
		60	40

DETAIL SYLLABUS

UNIT	Topic / Sub Topic	No of periods assigned	Marks
Unit - I	Inverse Trigonometric Functions Definition, range, domain, principal value branches. Elementary properties of inverse trigonometric functions.	08	5
Unit - II	Algebra 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. Non commutative properties of matrices. Existence of non zero matrices whose product is a zero matrix (restrict to square matrices of second order). (Here all matrices will have real entries).	09	7
	2. Determinants. Determinant of a square matrix (upto 3x3 matrices) properties of determinants, minors, cofactors and application of determinant 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. Solution of system of linear equation in two or three variables (having unique solution) using inverse of a matrix.	09	6

Unit - III	<p style="text-align: center;">CALCULUS</p> <p>1. Continuity and Differentiability Concept of Continuity and differentiability, derivative of composite function, chain rule, derivatives of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions, Derivative of logarithmic and exponential functions, Logarithmic Differentiation, derivatives of functions expressed in parametric forms. Second order derivatives.</p>	14	8
	<p>2. Application of Derivatives Application of derivatives, Rate of change of quantities, 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 situation.</p>	16	8
Unit- IV	<p>PROBABILITY Conditional probability, Multiplication theorem on probability, independent event, total probability, Bayes' theorem :</p>	04	6

MATHEMATICS (MTH2)**CLASS XII****SEMESTER IV****THEORY****FULL MARKS – 40****(SAQ AND LAQ* Type Question)**

UNIT	Topic	No of periods assigned	Marks
Unit -I	Vector Algebra	22	10
Unit - II	Integral Calculus	62	30
		84	40

DETAIL SYLLABUS

UNIT	Topic / Sub Topic	Contact Hours	Marks
	VECTORS		
Unit – I	1. Vectors Vectors and Scalars, magnitude and direction of a vector, Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position, vector of a point dividing a line segment in a given ratio. Properties and application of dot product of vectors, cross product of vectors.	22	10
	CALCULUS		
Unit-II	1. Integrals Integral as inverse process of differentiation, Integrations of a variety of function by substitution, by partial fractions and by parts. Education of simple integrals of the following types and problems based on them. $\int \frac{dx}{x^2 \pm a^2}; \int \frac{dx}{\sqrt{x^2 \pm a^2}} \quad \int \frac{dx}{\sqrt{a^2 - x^2}} \quad \int \frac{dx}{ax^2 + bx + c}$ $\int \frac{dx}{\sqrt{ax^2 + bx + c}} \quad \int \frac{px + q}{ax^2 + bx + c} dx \quad \int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx$ $\int \sqrt{a^2 \pm x^2} dx \quad \int \sqrt{x^2 - a^2} dx \quad \int \sqrt{ax^2 + bx + c} dx$ Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.	28	12

	2. Application of the Integrals Application in finding the area under simple curves, especially lines, circles / parabola / ellipses (in standard form only)	17	8
	3.Differential Equation Definition, order and degree, general and particular solution of a differential equation. Solution of a differential equation by method of separation of variables, Solution of homogeneous differential equation of first order and first degree. Solution of linear differential equation of the type $\frac{dy}{dx} + py = q$ where p and q are function of x or constants. $\frac{dx}{dy} + px = q$ where p and q are functions of y or constants.	17	10