INDIAN SCHOOL MUSCAT
SENIOR SECTION
DEPARTMENT OF MATHEMATICS
CLASS - XII
YEAR PLAN 2020-2021 (REVISED)

Subject :(Code : 041)

UNIT No.	Unit	Marks
1.	• Relations and Functions	8
2.	• Calculus	35
3.	• Algebra	10
4.	• Vector Algebra • 3Dimentional Geometry	14
5	• Probability	**8**
6	• LPP	**5**
	Total	**80**

MONTH	UNITT/CHAPTER	EXTRA TOPICS (this portion will not be tested but will be discussed)
March 2020	• **Relations and Functions** Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. • **Matrices** Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, Symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and Multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non commutatively of multiplication of matrices, Invertible matrices; (Here all matrices will have real entries). Symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and Multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non commutatively of multiplication of matrices, Invertible matrices; (Here all matrices will have real Entries).	• Composite functions • Inverse of a function. • Existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2).

April 2020	• **Determinants** Determinant of a square matrix (up to 3 x 3 matrices), minors, co-factors and applications of Determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.	• Properties of determinants • Consistency, inconsistency and number of solutions of system of linear equations by examples
	• **Inverse Trigonometry** Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric functions.	• Graphs of inverse trigonometric functions. • Elementary properties of inverse trigonometric functions.
MAY 2020	• **Continuity and Differentiability** 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.	

MAY 2020	Concept of exponential and logarithmic functions. Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.	
JUNE 2020	• **Application of Derivatives** Applications of derivatives: increasing/decreasing functions, tangents and normal, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable Tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real life Situations).	• Rate of change of bodies. • Use of derivatives in approximation..
JULY 2020	• **REVISION: INVERSE TRIGO.FUNCTIONS** **Integration** Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts. simple integrals of the following type to be evaluated. $\frac{dx}{x^2 \pm a^2}$, $\frac{dx}{\sqrt{x^2 \pm a^2}}$, $\frac{dx}{\sqrt{a^2 - x^2}}$, $\frac{dx}{ax^2 + bx + c}$, $\frac{dx}{\sqrt{ax^2 + bx + c}}$ $\frac{px + q}{ax^2 + bx + c}dx$, $\frac{px + q}{\sqrt{ax^2 + bx + c}}dx$, $\sqrt{a^2 \pm x^2}\,dx$, $\sqrt{x^2 - a^2}\,dx$ $\sqrt{ax^2 + bx + c}\,dx$ **PERIODIC 2**	
JULY 2020	• **Integration (continued)** Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals. • **Application of Integration** Applications in finding the area under simple curves, especially lines, circles/parabolas/ellipses (in standard form only)	• Definite integrals as a Limit of a sum. • Area between the two above said curves (the region should be clearly identifiable).

AUGUST 2020	• **Differential Equations(continued)** Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree of the type: $\frac{dy}{dx} = f(\frac{y}{x})$. Solutions of linear differential equation of the type: $\frac{dy}{dx}$+ py = q, where p and q are functions of *x* or constants **PROJECT**	• Formation of differential equation whose general solution is given • solutions of homogeneous differential
August 2020	• **Vector Algebra** Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios 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. Definition, Geometrical Interpretation, Properties and application of scalar (dot) product of vectors, vector (cross) product of vectors. • **3Dimentional Geometry** Direction cosines and direction ratios of a line joining two points. Cartesian and vector equation of a line, coplanar and skew lines, shortest distance between two lines.	• Scalar triple product • Angle between (i) two lines, (ii) two planes, (iii) a line and a plane.
September 2020	**ASSESSMENT** • **3Dimentional Geometry (CONTINUE)** Cartesian and vector equation of a plane. Distance of a point from a plane.	
October 2020	• **Linear Programming Problems** Introduction, related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems. graphical method of solution for problems in two variables, feasible and infeasible regions (bounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).	• Mathematical formulation of L.P. problems.

	• **Probability** Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution.	
November 2020	**FINAL TERM EXAMINATION**	
December 2020	**HOLIDAYS**	
January 2021	**FIRST PRE BOARD EXAMINATION**	
February 2021	**SECOND PRE BOARD EXAMINATION**	
March 2021	**BOARD EXAMINATION**	