



INDIAN SCHOOL MUSCAT
SENIOR SECTION
DEPARTMENT OF MATHEMATICS
CLASS XI
YEAR PLAN 2020-2021

Subject (Code: 041)

UNIT No.	Unit	Marks
1.	ALGEBRA	30
2.	SETS, RELATIONS & FUNCTIONS, TRIGONOMETRIC FUNCTIONS	23
3.	COORDINATE GEOMETRY	10
4.	CALCULUS	7
5.	STATISTICS AND PROBABILITY	10
	TOTAL	80

MONTH	UNIT (strictly as per the revised plan)	EXTRA TOPICS (not to be tested in Exams)
March 2020	NIL	
April 2020	SETS: Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of real numbers especially intervals (with notations), Power set. Universal set. Venn diagrams. Union and Intersection of sets.	Introduction to: Difference of sets. Complement of a set. Properties of Complement Sets. Practical applications of Union and Intersection.
May 2020	PERMUTATIONS & COMBINATIONS: Fundamental principle of counting. Factorial n . Permutations and combinations. Formula for nP_r , nC_r . Simple applications. PROBABILITY: Random experiments; outcomes, sample spaces (set representation).	BINOMIAL THEOREM: basic introduction to binomial theorem and Pascal's triangle.
June 2020	PROBABILITY (continued...): Events; occurrence of events – 'not', 'and' & 'or' events, exhaustive events, mutually exclusive events, Probability of an event, probability of 'not', 'and' & 'or' events.	Introduction to Axiomatic (set theoretic) approach to probability.

	<p>RELATIONS AND FUNCTIONS: Ordered pairs, Cartesian product of sets. Number of elements in the Trigonometric product of two finite sets. Cartesian product of the set of reals with itself (up to $\mathbb{R} \times \mathbb{R} \times \mathbb{R}$). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function.</p>	
July 2020	<p>RELATIONS AND FUNCTIONS (continued): Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions, with their graphs. Concept of exponential and logarithmic function.</p> <p>SEQUENCES & SERIES: Arithmetic Progression (A.P.). Arithmetic Mean (A.M.). Geometric Progression (G.P.), general term of a G.P., sum of n terms of a G.P., Arithmetic and Geometric series infinite G.P. and its sum. Geometric mean (G.M.), relation between A.M. and G.M.</p>	<p>Introduction of Sum, Difference, Product and Quotients of functions.</p> <p>Introduction to:</p> <p>Sum to n terms of the special series</p> $\sum_{k=1}^n k, \sum_{k=1}^n k^2, \sum_{k=1}^n k^3$
August 2020	<p>LINEAR INEQUALITIES:</p> <p>Linear inequalities; Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables</p> <p>STRAIGHT LINES:</p> <p>Brief recall of two-dimensional geometry from earlier classes; Slope of a line. Angle between two lines. Various forms of equation of a line: parallel to axis, point-slope form, slope-intercept form, two-point form, intercept form and normal form. General equation of a line. Distance of a point from a line.</p>	<p>Introduction to</p> <p>Principle Of Mathematical Induction</p>
September 2020	<p>CONIC SECTIONS: Sections of a cone: circle, ellipse, parabola, hyperbola, Standard equation of a circle. Standard equations and simple properties of parabola, ellipse and hyperbola</p> <p>HALF -YEARLY EXAMINATION</p>	

<p>October 2020</p>	<p>. THREE- DIMENSIONAL GEOMETRY: Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.</p> <p>STATISTICS: Measures of dispersion; Range, Mean deviation, Variance and Standard deviation of ungrouped/grouped data.</p>	
<p>November 2020</p>	<p>TRIGONOMETRIC FUNCTIONS: Positive and Negative angles (degree & radian measure and their conversion from one form to another). Definition of trigonometric functions with the help of unit circle. Truth of the identity $\sin^2 x + \cos^2 x = 1$ for all x. Signs of trigonometric functions. Domain and Range of trigonometric functions and their graphs.</p> <p>TRIGONOMETRIC FUNCTIONS (continued): Expressing $\sin(x \pm y)$, $\cos(x \pm y)$ in terms of $\sin x$, $\sin y$, $\cos x$, $\cos y$ and their simple applications. Deducing identities like the following:</p> $\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}, \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$ $\sin \alpha \pm \sin \beta = 2 \sin \frac{1}{2}(\alpha \pm \beta) \cos \frac{1}{2}(\alpha \mp \beta)$ $\cos \alpha + \cos \beta = 2 \cos \frac{1}{2}(\alpha + \beta) \cos \frac{1}{2}(\alpha - \beta)$ $\cos \alpha - \cos \beta = -2 \sin \frac{1}{2}(\alpha + \beta) \sin \frac{1}{2}(\alpha - \beta)$ <p>Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$, $\tan 3x$.</p>	<p>Basic trigonometric equations</p>
<p>December 2020</p>	<p>WINTER BREAK</p>	
<p>January 2021</p>	<p>LIMITS & DERIVATIVES: Derivative introduced as rate of change both as that of distance function and geometrically. Intuitive idea of limit. Limits of polynomials and rational functions, Trigonometric, exponential and logarithmic functions. Definition of derivative related to slope of tangent of the curve. Derivative of sum, difference, Product and quotient of functions. Derivatives of polynomial and Trigonometric functions.</p> <p>COMPLEX NUMBERS & QUADRATIC EQUATIONS: Need for complex numbers, especially $\sqrt{-1}$ to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Argand plane Statement of Fundamental Theorem of Algebra, solution of quadratic equations (with real coefficients) in the complex number system.</p>	<p>Introduction to Polar representation of complex numbers. Square root of a complex number.</p>

February 2021	Revision + Final Examinations	
March 2021	Final Examinations	

