ARMY PUBLIC SCHOOL RAKHMUTHI
SYLLABUS OF MATHEMATICS (SPLIT-UP)
CLASS-XI (SESSION 2023-24)

MONTH	UNIT/CHAPTER	CONTENT	ACTIVITIES/PROJECT WORK
MAY	**CHP 1. Sets** **CHP 2. Relations & Functions**	**Sets:** Sets and their representations, Empty set, Finite and Infinite sets, Equal sets, Subsets, Subsets of a set of real numbers especially intervals (with notations). Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set. Properties of Complement. **Relations & Functions:** Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself (upto R x R x R).Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer functions, with their graphs. Sum, difference, product and quotients of functions.	1. To find the number of subsets of a given set and verify that if a set has n number of elements, then the total number of subsets is 2^n .
JUNE UT-1	**CHP 3. Trigonometric Functions** **REVISION OF SYLLABUS**	**Trigonometric Functions :** The identity sin2x + cos2x = 1, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing *sin (x±y)* and *cos (x±y)* in terms of sin*x*, sin*y*, cos*x* & cos*y* and their simple applications. Deducing identities CHP 1. Sets CHP 2. Relations & Functions	
JULY	**CHP 4. Complex Numbers & Quadratic Equations** **CHP 5. Linear Inequalities**	**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 **Linear inequalities:** Algebraic solutions of linear inequalities in one variable and their representation on the number line.	2. To represent set theoretic operations using Venn diagrams. 3. To verify that for two sets A and B, n (A×B) = pq and the total number of relations from A to B is 2^{pq}, where n(A) = p and n(B) = q.

AUGUST **HALF YEARLY EXAM**	<u>**REVISION OF SYLLABUS OF HALF- YEARLY**</u>	CHP 1. Sets CHP 2. Relations & Functions CHP 3. Trigonometric Functions CHP 4. Complex Numbers & Quadratic Equations CHP 5. Linear Inequalities	4. To verify distributive law for three given non-empty sets A, B and C, that is, A ∪ (B ∩ C) = (A ∪ B) ∩ (A ∪ C) 5. To identify a relation and a function.
SEPTEMBER	**CHP 6. Permutations and Combinations** **CHP 7. Binomial Theorem** **CHP 8. Sequence and Series**	**Permutations and Combinations:** Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, derivation of Formulae for nP_r and nC_r and their connections, simple applications. **Binomial Theorem:** Historical perspective, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, simple applications. **Sequence and Series** : Sequence and Series. Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of *n* terms of a G.P	6. To distinguish between a Relation and a Function.
OCTOBER	**CHP 8. Sequence and Series(contd)** **CHP 9. Straight Lines** **CHP 10. Conic Sections**	**Sequence and Series:** Infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M. **Straight Lines:** Brief recall of two dimensional geometry from earlier classes. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axis, point -slope form, slope-intercept form, two-point form, intercept form, Distance of a point from a line. **Conic Sections:** Sections of a cone: circles, ellipse, parabola, hyperbola, a point, a straight line and a pair of intersecting lines as a degenerated case of a conic section.	7. To verify the relation between the degree measure and the radian measure of an angle.
NOVEMBER	**CHP 10. Conic Sections(contd)** **CHP 11. Introduction to Three-dimensional Geometry** **CHP 12. Limits and Derivatives**	**Conic Sections:** Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle. **Introduction to Three-dimensional Geometry:** Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points. **Limits and Derivatives:** Derivative introduced as rate of change both as that of distance function and	8. To find the values of sine and cosine functions in second, third and fourth quadrants using their given values in first quadrant.

		geometrically. Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and logarithmic functions. Definition of derivative relate it to scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.	
DECEMBER **UNIT TEST-2**	**CHP 13. Statistics** **CHP 14. Probability** **CHP 10. Conic Sections** **CHP 11. Introduction to Three-dimensional Geometry** **CHP 12. Limits and Derivatives**	**Statistics:** Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data. **Probability:** Events; occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Axiomatic (set theoretic) probability, connections with other theories of earlier classes. Probability of an event, probability of 'not', 'and' and 'or' events.	9. To prepare a model to illustrate the values of sine function and cosine function for different angles which are multiples of π and $\frac{\pi}{2}$. 10. To plot the graphs of sin x, sin 2x, 2sinx and sin 2 x , using same coordinate axes.
JANUARY		<u>**REVISION OF WHOLE SYLLABUS:**</u>	
FEBRUARY FINAL EXAM	<u>**SYLLABUS : CHP 1 TO 14**</u>		