GURU HARKRISHAN PUBLIC SCHOOLS, NEW DELHI

SUBJECT: STANDARD MATHEMATICS (041)

DIVISION OF SYLLABUS SESSION 2022-2023

CLASS XI

Book Prescribed: **MATHEMATICS** by NCERT
Unit wise Distribution of Theory Marks with Periods

Unit No.	Unit Name	Marks	Periods Theory
1	Sets & Functions	**23**	60
2	Algebra	**25**	50
3	Coordinate Geometry	**12**	50
4	Calculus	**8**	40
5	Statistics & Probability	**12**	40
	Total	**80**	240
	Internal Assessment	**20**	

Month-wise Syllabus Bifurcation

Month	Chapter	Topics
July-2022	**Chapter 1 SETS**	Sets and their representation, Empty Set, Finite and In finite 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.
	Chapter 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS	Need for complex numbers, especially √-1 to be motivated by inability to solve some of the quadratic equations. Algebraic Properties of complex numbers, Argand plane.
August-2022	**Chapter 2 RELATIONS AND FUNCTIONS**	Ordered pairs, Cartesian product of sets, Number of elements in the cartesian product of two finite sets. Cartesian product of set of reals with itself (up to R × 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 function.

August-2022	**Chapter 3 TRIGONOMETRIC FUNCTIONS**	Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure 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. Expressing sin (x+y), sin (x-y) ,cos(x+y) and cos (x-y) in terms of sinx ,siny ,cosx and cos y and their simple application s. Deducing identities like the following: $\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}$ $\text{Cot}(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$ $\sin A \pm \sin B = 2 \sin 1/2(A \pm B) \cos 1/2 (A \mp B)$ $\cos A + \cos B = 2 \cos 1/2 (A+B) \cos 1/2 (A-B)$ $\cos A - \cos B = -2\sin 1/2(A+B) \sin 1/2 (A-B)$ Identities related to Sin2x ,Cos2x ,tan2x ,Sin3x, cos 3x and tan3x. Remark - General solutions of Trigonometric functions should be discussed in brief.
	Chapter 9 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. Infinite G.P and its sum, Geometric mean (GM), relation between A.M and G.M.

September-2022	**Chapter 6 LINEAR INEQUALITIES**	Linear Inequalities, Algebraic solutions of linear Inequalities in one variable and their representation on the number line.
	Half Yearly Theory Examination	
October-2022	**Chapter 7 PERMUTATIONS & COMBINATIONS**	Fundamental principle of counting. Factorial n. (n!) Permutations and combinations, derivation of Formulae for "P. and "C, and their connections, simple applications.
	Chapter 8 BINOMIAL THEOREM	Historical perspective, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, simple applications.
November-2022	**Chapter 10 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.
	Chapter 11 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. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.
	CHAPTER 12 INTRODUCTION TO THREE DIMENSIONAL GEOMETRY	Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points.
December-2022	**Chapter 16 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.
	Chapter 15 STATISTICS	Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data.
January-2023	**Chapter 13 LIMITS AND 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 relate it to scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.

MATHEMATICS (041) SESSION 2022-2023

CLASS XI

Syllabus Bifurcation for Unit Test, Half Yearly Exam & Annual Exam.

S. No.	Test	Chapters
1.	Unit Test-1 (30 Marks)	Chapter 1 SETS Chapter 5 COMPLEX NUMBERS & QUADRATIC EQUATIONS
2.	Half Yearly (Theory = 80 Marks)	Syllabus of Unit Test-1 Chapter 2 RELATIONS AND FUNCTIONS Chapter 3 TRIGONOMETRIC FUNCTIONS Chapter 6 LINEAR INEQUALITIES Chapter 9 SEQUENCE AND SERIES
3.	Unit Test-2 (35 Marks)	Chapter 7 PERMUTATIONS & COMBINATIONS Chapter 8 BINOMIAL THEOREM Chapter 10 STRAIGHT LINES
4.	Unit Test-3 (35 Marks)	Chapter 11 CONIC SECTIONS Chapter 12 INTRODUCTION TO THREE DIMENSIONAL GEOMETRY Chapter 16 PROBABILITY
5.	Annual Examination (Theory = 80 Marks)	ENTIRE SYLLABUS

Internal Assessment (20 marks)
Periodic Tests (Best 2 out of 3 – 10Marks)
Mathematics Activities (10 Marks)