



**BAL BHARATI PUBLIC SCHOOL**  
**COMMON ANNUAL EXAMINATION (2024-2025)**

**SYLLABUS**

CLASS: XI

SUBJECT: MATHEMATICS

**TEXTBOOKS:**

1. Mathematics: Textbooks for class XI-NCERT Publication.
2. Mathematics: Exemplar problems for class XI-NCERT Publication.

S.NO	UNIT	CHAPTER /TOPIC&SUBTOPICS	Weightage
1	SETS & FUNCTIONS	<p><b>1. SETS</b> 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.</p> <p><b>2. RELATION AND FUNCTIONS</b> 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 (up to <math>R \times R \times R</math>). 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.</p> <p><b>3. TRIGONOMETRIC FUNCTIONS</b> 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 <math>\sin^2x + \cos^2x = 1</math>, for all <math>x</math>. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing <math>\sin(x \pm y)</math> and <math>\cos(x \pm y)</math> in terms of <math>\sin x</math>, <math>\sin y</math>, <math>\cos x</math> &amp; <math>\cos y</math> and their simple applications. Identities related to <math>\tan(x \pm y)</math>, <math>\cot(x \pm y)</math>, <math>\sin \alpha \pm \sin \beta</math>, <math>\cos \alpha + \cos \beta</math>, <math>\sin 2x</math>, <math>\cos 2x</math>, <math>\tan 2x</math>, <math>\sin 3x</math>, <math>\cos 3x</math> and <math>\tan 3x</math>.</p>	23

2	ALGEBRA	<p><b>1. COMPLEX NUMBERS &amp; QUADRATIC EQUATIONS</b> Need for complex numbers, especially <math>\sqrt{-1}</math>, to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Argand plane</p> <p><b>2. LINEAR INEQUALITIES</b> Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line.</p> <p><b>3. PERMUTATIONS AND COMBINATIONS</b> Fundamental principle of counting. Factorial <math>n</math>. <math>(n!)</math> Permutations and combinations, derivation of Formulae for <math>P(n,r)</math> and <math>C(n,r)</math> and their connections, simple applications.</p> <p><b>4. BINOMIAL THEOREM</b> Historical perspective, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, simple applications.</p> <p><b>5. SEQUENCE AND SERIES</b> Sequence and Series. Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of <math>n</math> terms of a G.P., infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M</p>	25
3	COORDINATE GEOMETRY	<p><b>1. STRAIGHT LINES</b> 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.</p> <p><b>2. CONIC SECTIONS</b> 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.</p> <p><b>3. INTRODUCTION TO THREE DIMENSIONAL GEOMETRY</b> Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points.</p>	12
4	CALCULUS	<p><b>1. LIMITS AND DERIVATIVES</b> 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 relates it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.</p>	08

5	STATISTICS AND PROBABILTY	<p><b>1. STATISTICS</b> Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data.</p> <p><b>2. PROBABILITY</b> 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.</p>	12
			<b>TOTAL MARKS= 80</b>