MATHEMATICS (+1) (2024-2025)

The syllabus in the subject of Mathematics has undergone changes from time to time in accordance with growth of the subject and emerging needs of society. Senior Secondary stage is a launching stage from where the students go either for higher academic education in Mathematics or for professional courses like engineering, physical and Bioscience, commerce or computer applications. The present revised syllabus has been designed in accordance with National Curriculum Frame Work 2005 and as per guidelines given in Focus Group on Teaching of Mathematics 2005 which is to meet the emerging needs of all categories of students. Motivating the topics from real life situations and other subject areas, greater emphasis has been laid on application of various concepts.

OBJECTIVES

The broad objectives of teaching Mathematics at senior school stage intend to help the pupil

- to acquire knowledge and critical understanding particularly by way of motivation of visualization of basic facts, concepts, terms, principles and
- symbols and mastery of underlying processes and skills
- to feel the flow of reasons while proving a result or solving a problem
- to apply the knowledge and skills acquired to solve problems and wherever possible, by more than one method
- to develop positive attitude to think analyze and articulate logically
- to develop interest in the subject by participating in related competitions. to acquaint students with different aspects of mathematics used in daily life
- to develop awareness of the for national integration, protection of environment observance of small family norms, removal of social barriers, elimination of sex biases
- to develop reverence and respect towards great Mathematicians for their contribution to the field of Mathematics

COURSE STRUCTURE

1. Sets
2. Relations and Functions
3. Trigonometric Functions
4. Complex Numbers and Quadratic Equations
5. Linear Inequalities
6. Permutations and Combinations
7. Binomial Theorem
8. Sequences and Series
9. Straight Lines
10. Conic Sections
11. Introduction to Three Dimensional Geometry
12. Limits and Derivatives
13. Statistics
14. Probability

PRESCRIBED BOOKS

Mathematics Published by HPBoSE Dharmshala

Unit-I : Sets and Functions

1: Sets

Introduction, Sets and their representations. Empty set Finite and infinite sets, Equal sets, Subsets, Subsets of the set of real numbers especially intervals (with notations). Universal set, Venn diagrams, operations on sets Union and intersection of sets. Difference of sets: Complement of a set.

2: Relations and Functions

Introduction, Cartesian product of sets, Ordered pairs, Relation, Domain, Co Domain, Range, Function, Real Valued Function, Some Function and their graphs, Identity function, Constant Function, Polynomial Functions, Rational Functions, Modulus Functions, Signum Function, Greatest Integer Functions, Algebra of real Function.

3. Trigonometric Functions:

Introduction, Angles, Degree Measure, Radian Measure and their conversion, Notational Convention, Trigonometric Function and Sign of Trigonometric Functions, Domain and range of Trigonometric Functions, Trigonometric Functions of sum and difference of two angels.

Unit -II : Algebra

1. Complex Numbers

Introduction, complex numbers, Algebra of Complex Numbers, Power of i, the Square root of a negative real number, Complex number identities, the modulus and the conjugate of complex numbers, Argand Plane and Polar Representation (definition and its representation only)

2. Linear Inequalities :

Introduction and definition of inequalities, Algebraic solutions of linear inequalities in one variable and their graphical representation.

3. Permutations & Combinations :

Fundamental principle of counting. Permutations, Factorial notation, derivation of formulae, combinations and their Practical Problems.

4. Binomial Theorem

Introduction, statement and proof of the binomial theorem for positive integral indices Pascal's triangle, simple applications,

5. Sequence and Series:

Introduction, Sequence and Series. Geometric progression (GP) general term of a GP., sum of n terms of a GP , geometric mean (GM) relation between A.M. and G.M.

UNIT-III : COORDINATE GEOMETRY

1. Straight Lines :

Brief recall of 2D from earlier classes, Slope of a line , angle between two lines. Various forms of the equations of a line, point slope form, slope-intercept form, intercepts form. Distance of a point from a line and Distance between two parallel line.

2. Conic Sections :

Sections of cone, circles, ellipse, parabola, hyperbola, a point, a straight line and 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.

3. Introduction to Three-dimensional Geometry

Coordinate axes and coordinate planes in three dimensions, Coordinates of a point in space, Distance between two points.

UNIT-IV: CALCULUS

1. Limits and Derivatives :

Institutive idea of Derivative, Introduced as rate of change, Algebra of limits, limits of polynomials rational Function, limits of trigonometric Function, Derivatives, First Principle of Derivative, Algebra of Derivative of Functions, Derivatives of Polynomial and trigonometric functions, Limit involving exponential and logarithmic function.

UNIT-V: STATISTICS & PROBABILITY

1. Statistics :

Introduction, Measures of dispersion, Mean deviation of grouped/ungrouped data, about mean, and about median, Shortcut method for calculating for mean deviation about mean and about median, variance and standard deviation.

2. Probability:

Event, occurrence of events and its types, algebra of events mutually exclusive events, exhaustive event, Axiomatic approach to probability.