UNIT V: MENSURATION

1. AREAS

Area of a triangle using Heron's formula (without proof)

2. SURFACE AREAS AND VOLUMES

Surface areas and volumes of spheres (including hemispheres) and right circular cones.

UNIT VI: STATISTICS

STATISTICS

Bar graphs, histograms (with varying base lengths), and frequency polygons.

INTERNAL ASSESSMENT — Max. Marks: 20

(i) Activities (02)- 2X5 — **10 Marks**

(ii) Project Work (01) — **05 Marks**

(iii) Continuous Assessment (Unit Test) — **05 Marks**

(There will be total 4 Unit Tests to be conducted throughout the year (two Unit Tests before half yearly examination and two after half yearly examination). At the time of half yearly result preparation best of two Unit Tests (I & II) marks will be taken and converted to the weightage of 05 marks. Likewise best of two Unit Tests (III & IV) marks will be taken and converted to the weightage of 05 marks for the annual result preparation.)

Class – X

TOTAL MARKS- 100 {80 (Theory) + 20 (Internal Assessment)}

THEORY: 80 Marks **Time: 3:00 Hrs.**

Units	Unit Name	Marks
I	NUMBER SYSTEMS	06
II	ALGEBRA	20
III	COORDINATE GEOMETRY	06
IV	GEOMETRY	15
V	TRIGONOMETRY	12
VI	MENSURATION	10
VII	STATISTICS & PROBABILTY	11
	Total	**80**

UNIT I: NUMBER SYSTEMS

REAL NUMBER

Fundamental Theorem of Arithmetic- statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of $\sqrt{2}, \sqrt{3}\ \sqrt{5}$

UNIT II: ALGEBRA

1. POLYNOMIALS

Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials.

2. PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Pair of linear equations in two variables and graphical method of their solution, consistency/inconsistency.

Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically- by substitution, by elimination. Simple situational problems.

3. QUADRATIC EQUATIONS

Standard form of a quadratic equation $ax^2 + bx + c = 0, (a \neq 0)$. Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. Relationship between discriminant and nature of roots.

Situational problems based on quadratic equations related to day to day activities to be incorporated.

4. ARITHMETIC PROGRESSIONS

Motivation for studying Arithmetic Progression Derivation of the n^{th} term and sum of the first n terms of A.P. and their application in solving daily life problems.

UNIT III: COORDINATE GEOMETRY

Coordinate Geometry

Review: Concepts of coordinate geometry, graphs of linear equations. Distance formula. Section formula (internal division).

UNIT IV: GEOMETRY

1. TRIANGLES

Definitions, examples, counter examples of similar triangles.

a. (Prove) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
b. (Motivate) If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
c. (Motivate) If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
d. (Motivate) If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
e. (Motivate) If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.

2. CIRCLES

Tangent to a circle at, point of contact

a. (Prove) The tangent at any point of a circle is perpendicular to the radius through the point of contact.
b. (Prove) The lengths of tangents drawn from an external point to a circle are equal.

UNIT V: TRIGONOMETRY

1. **INTRODUCTION TO TRIGONOMETRY**

   Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); motivate the ratios whichever are defined at 0º and 90º. Values of the trigonometric ratios of 30^0, 45^0 and 60^0. Relationships between the ratios.

2. **TRIGONOMETRIC IDENTITIES**

   Proof and applications of the identity $sin^2A + cos^2A = 1$. Only simple identities to be given.

3. **HEIGHTS AND DISTANCES: Angle of elevation, Angle of Depression.**

   Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30°, 45°, and 60°.

UNIT VI: MENSURATION

1. AREAS RELATED TO CIRCLES

Area of sectors and segments of a circle. Problems based on areas and perimeter/circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60°, 90° and 120° only.

2. SURFACE AREAS AND VOLUMES

Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones.

UNIT VII: STATISTICS AND PROBABILITY

1. **STATISTICS**

   Mean, median and mode of grouped data (bimodal situation to be avoided).

2. **PROBABILITY**

   Classical definition of probability. Simple problems on finding the probability of an event.

INTERNAL ASSESSMENT — Max. Marks: 20

(i) Activities (02)- 2X5 — **10 Marks**

(ii) Project Work (01) — **05 Marks**

(iii) Continuous Assessment (Unit Test) — **05 Marks**

(There will be total 3 Unit Tests (two Unit Tests before half yearly examination and one after half yearly examination) and a pre-board examination to be conducted throughout the year. At the time of half yearly result preparation best of two Unit Tests (I & II) marks will be taken and converted to the weightage of 05 marks. In annual board examination, marks of the best out of 3 Unit Tests will be taken and converted to the weightage of 05 marks for the result preparation.)

PRESCRIBED BOOKS:

1. गणित (Mathematics) - Textbook for class IX - NCERT Publication
2. गणित (Mathematics) - Textbook for class X - NCERT Publication
3. Laboratory Manual - Mathematics, secondary stage - NCERT Publication
4. Mathematics exemplar problems for class IX, NCERT publication.
5. Mathematics exemplar problems for class X, NCERT publication.

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