Syllabus
Session-2020-21
Class – X
Subject : Mathematics (Code : 041 & 241)

Course Structure

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 & Probability	11
Total		80
Internal Assessment		20
Grand Total		100

Chapter 1 : Real Numbers

Fundamental Theorem of Arithmetic – statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$. Decimal representation of rational numbers in terms of terminating / non-terminating recurring decimals.

Chapter 2 : Polynomials

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

Chapter 3: 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. Solutions of a pair of linear equations in two variables algebraically – by substitution and by elimination method. Simple situational problems. Simple problems on equations reducible to linear equations.

Chapter 4: 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.

Chapter 5: Arithmetic Progressions

Motivation for studying Arithmetic Progression, Derivation of the n^{th} term and sum of the first n terms of A.P.

Chapter 6: Triangles

Definitions, examples, counter examples of similar triangles.

1. (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.
2. (Motivate) If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
3. (Motivate) If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
4. (Motivate) If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
5. (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.

6. (Motivate) If a perpendicular is drawn from the vertex of the right angle of a right triangle to the hypotenuse, the triangles on each side of the perpendicular are similar to the whole triangle and to each other.
7. (Prove) In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

Chapter 7: Coordinate Geometry

Lines (In two-dimensions)
Review: Concepts of co-ordinate geometry, graphs of linear equations. Distance formula. Section formula (internal division).

Chapter 8: Introduction to Trigonometry

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined). Values of the trigonometric ratios of 30^0, 45^0 and 60^0. Relationships between the ratios.
Proof and applications of the identity $\sin^2 A + \cos^2 A = 1$. Only simple identities to be given.

Chapter 9: Some Applications of Trigonometry

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 30^0, 45^0, 60^0

Chapter 10: Circles

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

Chapter 11: Constructions

Division of a line segment in a given ratio (internally).
Tangents to a circle from a point outside it.

Chapter 12: Area Related to Circles

Motivate the area of a circle; 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 60º and 90º only. Plane figures involving triangles, simple quadrilaterals and circle should be taken.)

Chapter 13: 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.
Problems involving converting one type of metallic solid into another and other mixed problems. (Problems with combination of not more than two different solids are taken.)

Chapter 14: Statistics

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

Chapter 15: Probability

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

- Mental Maths & YUVA sessions

Mathematics - Standard
Code (041)
Question Paper Design
Class – X (2020-21)

Time: 3 Hrs. **Max. Marks: 80**

S. No.	Typology of Questions	Total Marks	% Weightage (approx.)
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas	43	54
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	19	24
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	18	22
	Total	80	100

Internal Assessment	**20 Marks**
Pen Paper Test and Multiple Assessment (5+5)	10 Marks
Portfolio	05 Marks
Lab Practical (Lab activities to be done from the prescribed books)	05 Marks

Mathematics - Basic
Code (241)
Question Paper Design
Class – X (2020-21)

Time: 3 Hrs. **Max. Marks: 80**

S. No.	Typology of Questions	Total Marks	% Weightage (approx.)
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas	60	75
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	12	15
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	8	10
	Total	80	100

Internal Assessment	**20 Marks**
Pen Paper Test and Multiple Assessment (5+5)	10 Marks
Portfolio	05 Marks
Lab Practical (Lab activities to be done from the prescribed books)	05 Marks