

MATHEMATICS

VIII, IX & X

Syllabus for Class VIII

Full Marks-100

Arithmetic : 30 Marks

1. Revision of previous lessons.
2. Average, formation of frequency distribution table for simple cases and extraction of weighted mean.
3. Rule of three.
4. Concept of percentage and its application.
5. Mixture – application of ratio and proportion in their different problems.

Algebra : 40 Marks

1. Revision of previous lessons through exercises.
2. Multiplication of Polynomials – each with more than two terms. Division of polynomials with a divisor having more than one term.
3. Deduction of the following formulae and their applications :
 - (a) $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 = a^3 + b^3 + 3ab(a + b)$
 - (b) $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 = a^3 - b^3 - 3ab(a - b)$
 - (c) $(a + b)(a^2 - ab + b^2) = a^3 + b^3$
 - (d) $(a - b)(a^2 + ab + b^2) = a^3 - b^3$
4. Factorisation using the above formulae. Factorisation of a quadratic expression by breaking the middle term.
5. L.C.M. of simple algebraic expressions by factorisation method. Fractions and application of four fundamental algebraic operations on them.
6. Construction of single variable equation of first degree and their solution.

Geometry : 30 Marks

1. Revision of previous lessons.
2. Verification and application of the following propositions (use of transformation geometry should be preferred wherever possible)
 - (a) If a straight line stands on another straight line the sum of the two adjacent angles so formed is equal to two right angles.
 - (b) If the sum of two adjacent angles is equal to two right angles, exterior arms of the angles lie on the same straight line.
 - (c) If two straight lines intersect, the vertically opposite angles are equal.
 - (d) Properties of parallel straight lines and transversal :
 - (a) When a straight line intersects two other straight lines, these two straight lines, are parallel if, either (i) a pair of alternate angles are equal or (ii) a pair of interior angles on the same side of the transversal are together equal to two right angles.
 - (b) If a straight line cuts two parallel straight lines, then (i) the corresponding angles are equal (ii) the alternate angles are equal (iii) the sum of the interior angles on the same side of the transversal is equal to two right angles.
 - (e) Properties relating to two sides and their opposite angles of a triangle :
 - (i) If two sides of a triangle be equal, the angles opposite to these sides are equal.
 - (ii) If two angles of a triangle be equal, their opposite sides are equal.
 - (iii) If two sides of a triangle are unequal, the angle opposite to the greater side is greater than the angle opposite to smaller side. Conversely, if two angles are unequal, the side opposite to the greater angle is greater than the side opposite to the smaller angle.
 - (f) Congruence of triangles : With the help of transformation geometry, show that – (i) if one side and the two angles at its extremities of a triangle be equal to one side and the two angles at its extremities

of another triangle, the two triangles are congruent (ii) if the hypotenuse and one side of a right angled triangle be equal to the hypotenuse and one side of another right angled triangle, the two right angled triangles are congruent.

3. (a) Theorems relating to the angles of triangle and polygon :
 - (i) In a triangle, if one side is produced the exterior angle thus formed is equal to the sum of the two interior opposite angles. (ii) the sum of the three angles of a triangle is equal to two right angles. (iii) The sum of the interior angles of a polygon with n sides is equal to $2(n-2)$ right angles.
 - (b) Properties relating to the length of sides of a triangle : (i) In any triangle, the sum of two sides is greater than the third side. (ii) Among all the straight lines drawn from an external point to a given straight line the perpendicular is the shortest.
 - (c) Theorems concerning properties of parallelogram : In a parallelogram (i) diagonal divides the parallelogram into two congruent triangles (ii) opposite sides are equal. (iii) opposite angles are equal. (iv) diagonals bisect each other.
 - (d) A quadrilateral is a parallelogram if, (i) Opposite sides are equal, or (ii) Opposite angles are equal, or (iii) Any two opposite sides are equal and parallel, or (iv) Its diagonals bisect each other.
4. A few constructions :
 - (a) To construct a triangle when (i) two angles and one side opposite to one of the given angles are given (ii) two sides and an angle opposite to one of the given sides are given.
 - (b) To draw a straight line through a given point parallel to a given straight line.
 - (c) To divide a line segment into three equal segments. Construction of simple problems based on the above constructions.

Class IX

Full Marks-100

ARITHMETIC (20 Marks)

1. Revision of Previous Lessons.
2. Broader Applications of Rule of Three.
3. Simple Interest.
4. Partnership Business – application of ratio and proportion in its different problems.
5. Acquaintance with the terms S.B. A/c, R.D. A/c, T.D. A/c, F.D. A/c, Bank Draft, Pass Book, Cheque Book in connection with Banking. (No Problems).

ALGEBRA (40 Marks)

1. Revision of Previous Lessons.
2. Simple problems on finding H.C.F. by Division Method.
3. Formation of linear simultaneous equations of two variables and their solution (by methods of Substitution and Comparison Only); simple applications.
4. Idea of rectangular Cartesian Co-ordinate system. Co-ordinates of a point. Distance between two points on the axes. Graphs (two dimensional). Drawing the graph of the linear equation. Solution of simultaneous linear equations of two variables by graphical method.

GEOMETRY (30 Marks)

1. Revision of previous works through simple exercise.
2. To establish the following propositions :
 - (a) The straight line, drawn through the middle point of one side of a triangle parallel to another side, bisects the third side and is equal to half of the second side. The line segment joining the middle points of two sides of a triangle is parallel to the third side and is equal to half of it.
 - (b) If there are three or more parallel lines and the intercepts made by them on any one straight line that cuts them are equal, then the corresponding intercepts on any other straight line that cuts them are also equal.
 - (c)
 - (i) Parallelogram on the same base and between the same parallels (or of the same altitude) are equal in area.
 - (ii) Triangles on the same base (or on equal bases) and between the same parallels (or of the same altitude) are equal in area.
 - (iii) Triangles having equal area, on the same base and on the same side of it are between the same parallel (no formal proof).
 - (iv) If a triangle and a parallelogram stand on the same base and between the same parallels, the area of the triangle is half that of the parallelogram.
 - (d)
 - (i) The perpendicular bisectors of the sides of a triangle are concurrent.
 - (ii) The perpendiculars drawn from the vertices of a triangle on the opposite sides are concurrent.
 - (iii) The bisectors of the angles of a triangle are concurrent.
 - (iv) The medians of a triangle are concurrent.

3. Pythagoras Theorem – Statement and application.

4. Construction :

- (i) To draw a parallelogram equal in area to a given triangle and having one of its angles equal to a given angle.
- (ii) To draw a triangle equal in area to a given quadrilateral.

MENSURATION (10 Marks)

1. Perimeter and area of a rectangle, a square, a triangle, area of any rectilinear figure.
2. Circumference and area of a circle. (taking approximate value of π as $\frac{22}{7}$). [Only statement of formulae and their numerical applications]
3. Problems related to surface and volume of a rectangular parallelepiped.

CLASS X

Full Marks-100

ARITHMETIC : 15 Marks

1. Miscellaneous problems on Mixture
2. Profit and Loss
3. Interest : Simple and Compound (upto three interest periods, calculating the interest of each period and compounding it)
4. Rate of growth related to social affairs (simple problems).

ALGEBRA : 35 Marks

1. Problems on finding H.C.F. and L.C.M. of polynomials by factorization method. Relation between L.C.M. and H.C.F.
2. Solution of linear simultaneous equations of two variables (by methods of Elimination and Cross Multiplication).
3. Solution of Quadratic Equations with rational roots. Acquaintance with Sridhar Acharya's method. Simple Applications.
4. Problems on Ratio and Proportion. Variation : direct and inverse variation, joint variation, theorem on joint variation (statement only). Simple applications.
5. Inequations with one or two variables only. Graphical representation of inequations: solution region.
6. Surds : Basic operations only (upto quadratic surds).

GEOMETRY : 25 Marks

1. SAME as Before.
2. SAME as Before.
3. Construction :
 - (a) To draw a circle circumscribing a triangle
 - (b) To draw a circle inscribed in a triangle
 - (c) same as (i) before
 - (d) same as (ii) before
 - (e) same as (iii) before

4. Simple applications based on above propositions and constructions.

MENSURATION : 10 Marks

1. Except Rectangular parallelopiped everything same as before;

TRIGONOMETRY : 15 Marks

1. same as before.

Note: Objective and very short answer type questions given in the first part of the question paper will be framed according to the Mathematics Syllabi upto Madhyamik level.

UNITISATION

Unit Testwise Division of Mathematics Syllabus of Class VIII

	1 st Unit 20M	2 nd Unit 20M	3 rd Unit 30M	4 th Unit 20M	5 th Unit 10M Oral	Summative 100M
Arithmetic	Revision of Previous Lessons & Average. Page No. 13 to 24	Frequency Distribution & Rule of Three. Page No. 25 to 42	Percentage. Page No. 43 to 52	Mixture. Page No. 53 to 58	Average & Percentage.	Rule of Three, Percentage & Mixture.
Algebra	Revision of Previous Lessons & Multiplication and Division of Polynomials. Page 61 to 84	Algebraic Formulae for Determination of Cube. Page No. 85 to 100	Factor of Quadratic and Cubic expressions. Page No. 101 to 113	Algebraic fraction & Formation and Solution of Linear Equation in one variable. Page No. 114 to 136	Algebraic Formulae & Simple equation.	Topics of 2nd, 3rd & 4th Unit Test.
Geometry	Revision of Previous Lessons. Page 141-147	Basic Geometrical Properties, Verification of few Geometrical Axioms through Activities. Page No. 148-174	Theorems on Triangles & Quadrilateral & Parallelogram. Page No. 175-192	Construction. Page No. 193-200	Topics of 1st & 3rd Unit Tests.	Topics of 2nd, 3rd & 4th Unit Test.

Unit Testwise Division of Mathematics Syllabus of Class IX

	1st Unit 20M	2nd Unit 20M	3rd Unit 30M	4th Unit 20M	5th Unit 10M Oral	Summative 100M
Arithmetic	Revision of Previous Lessons (Average) Page: 1-20	Revision of Previous Lessons (Rule of Three & Broader Application of Rule of Three) Page: 21-25	Revision of Previous Lessons (Percentage and Simple Interest) Page: 26-36	Revision of Previous Lessons. Familiarity with different Savings Scheme in a Bank Page: 36-48	Topics of second, third and fourth Unit Test	Rule of Three and its extension Percentage, Simple Interest Partnership business
Algebra	Revision of Previous Lessons Page: 51-55	Formation of Simple Equation of one variable, its Solution. Simple Simultaneous Equation & its Solution (comparison and Substitution Method) Page: 55-65	Condition for Solvability of Linear Simultaneous Equation in two variables Page: 67-77	Graph (Two Dimensional) Page: 77-90	Topics of second, third and fourth Unit Test	Topics of second, third and fourth Unit Test
Geometry	Revision of previous Lessons Proposition involving transversal and mid point Theorem Page: 91-111	Theorems involving area page- 112-129	Therems on concurrency and Pythagoras Theorem Page : 130-141	Geometrical construction: Page : 142-149	Topics of second and third Unit test	Topics of second, third and fourth Unit Test
Mensuration	Rectangle and Square Page: 153-159	Triangle and Quadrilateral Page: 160-177	Circle Page : 178-188	Rectangular Parallelopiped Page: 189-196	Topics of first and fourth UnitTest	Topics of second and third Unit Test