SYLLABUS OUTLINE FOR MATHEMATICS CLASS VII

Content outline	Periods	Term
NUMBER SYSTEM: **i) Integers:** ▪ Multiplication and division of integers (through patterns). Division by zero is meaningless. ▪ Properties of integers (including identities for addition and multiplication, commutative, associative, distributive) through patterns. These would include examples from whole numbers as well. Involve expressing commutative and associative properties in a general for. Construction of counter-examples including some by children. Counter examples like subtraction is not commutative. ▪ Word problems including integers (all operations)	15	I
ii) Fractions and rational numbers: ▪ Multiplication of fractions. ▪ Fraction as an operator ▪ Reciprocal of a fraction ▪ Division of fractions. ▪ Word problems involving mixed fractions ▪ Introduction to rational numbers (with representation on number line) ▪ Operations on rational numbers (all operations)	12	II
ii) Fractions and rational numbers: (contd-) ▪ Representation of rational number as a decimal. ▪ Word problems on rational numbers (all operations). ▪ Multiplication and division of decimal fractions. ▪ Conversion of units (length and mass) ▪ Word problems on rational numbers (including all operations).	8	III

iii) Powers: ▪ Exponents only natural numbers. ▪ Laws of exponents (through observing patterns to arrive at generalization). i. $a^m . a^n = a^{m+n}$ ii. $(a^m)^n = a^{mn}$ iii. $\frac{a^m}{a^n} = a^{m-n}$, where $m - n \in N$ iv. $a^m . b^m = (ab)^m$	15	III
ALGEBRA: **Algebraic Expressions** ▪ Generate algebraic expression (simple) involving one or two variables. ▪ Identify constants, coefficient, powers. ▪ Like and unlike terms, degree of expressions e.g., x^2y etc. (exponent ≤ 3 number of variables ≤ 2). ▪ Addition, subtraction of algebraic expressions (coefficient should be integers). ▪ Simple linear equations in one variable (in contextual problems) with two operations (avoid complicated coefficients).	20	I
RATIO AND PROPORTION: ▪ Ratio and proportion (revision) ▪ Unitary method continued consolidation, general expression. ▪ Percentage – an introduction ▪ Understanding percentage as a fraction with denominator 100 ▪ Converting fractions and decimals into percentage and vice-versa. **RATIO AND PROPORTION: (contd-)** ▪ Application to profit and loss (single transaction only) ▪ Application to simple interest (time period in complete years.)	12 8	II III

GEOMETRY: **i) Understanding Shapes** ▪ Pairs of angle (linear, supplementary, complementary, adjacent, vertically opposite). (Verification and simple proof of vertically opposite angles.) ▪ Properties of parallel lines with transversal (alternate corresponding, interior, exterior angles)	10	I
ii) Properties of Triangles: ▪ Angle sum property (with notions of proof and verification through paper folding, proofs using parallel lines, difference between proof and verification). ▪ Extension angle property ▪ Sum of two side of a triangle its third side. ▪ Pythagoras Theorem (Verification only)	10	II
iii) Symmetry: ▪ Recalling reflection symmetry. ▪ Idea of rotational symmetry, observation of rotational symmetry of 2D objects (90˚,120˚,180˚) ▪ Operations of rotation through 90˚ and 180˚ of simple figures. ▪ Examples of figures with both rotation and reflection of symmetry (both operations). ▪ Examples of figures that have reflection and rotation symmetry and vice versa.	10	I
iv) Representing 3D in 2D: ▪ Drawing 3D figures in 3D showing hidden faces. ▪ Identification and counting of vertices, edges, faces, nets (for cubes, cuboids, cylinders, cones) ▪ Match pictures with objects (identifying names). ▪ Mapping the space approximately through visual estimation.	10	I
v) Congruence: ▪ Congruence through superposition (example – blades, stamps, coins etc.) ▪ Extend congruence to simple geometrical shapes e.g., triangles, circles etc. ▪ Criteria of congruence (by verification) SSS, SAS, ASA, RHS.	10	II

vi) Construction (using scale, protractor, compasses): ▪ Construction of a line parallel to a given line from a point outside it. (Simple proof as remark with reasoning of alternate angles). ▪ Construction of simple triangles. Like given three sides, given a side and two angles on it, given two sides and the angle between them.	10	II
MENSURATION: ▪ Revision of perimeter, idea of π, circumference of circle. ▪ Area – Concept of measurement using basic unit area of a square, rectangles, triangle, parallelogram and circle, area between two rectangles and two concentric circles.	15	III
DATA HANDLING: ▪ Collection and organization of data – choosing the data to collect for a hypothesis testing ▪ Mean, median and mode of ungroup data – understanding what they represent ▪ Constructing bar graphs ▪ Feel of probability using data through experiments. Notion of chance in events like tossing coins, dice etc. Tabulating and counting occurrences of 1 through 6 in a number of throws. Comparing the observation with tat for a coin. Observing strings of throws, notion of randomness.	15	III