

# THE LAWRENCE SCHOOL

## SANAWAR

### Syllabus for Class VII Entrance Examination: MATHEMATICS

#### Number System

##### (i) *Knowing our Numbers:*

Consolidating the *sense* of numberness up to 5 digits, Size, estimation of numbers, identifying smaller, larger, etc. Place value use of symbols =, <, > and use of brackets, word problems on number operations involving large numbers up to a maximum of 5 digits in the answer after all operations. This would include conversions of units of length & mass (from the larger to the smaller units), estimation of outcome of number operations. Introduction to a sense of the largeness of, and initial familiarity with, large numbers up to 8 digits and approximation of large numbers)

##### (ii) *Playing with Numbers:*

Simplification of brackets, Multiples and factors, divisibility rule of 2, 3, 4, 5, 6, 8, 9, 10, 11. (All these through observing patterns. Children would be helped in deducing some and then asked to derive some that are a combination of the basic patterns of divisibility.) Even/odd and prime/composite numbers, Co-prime numbers, prime factorization, every number can be written as products of prime factors. HCF and LCM, prime factorization and division method for HCF and LCM, the property  $LCM \times HCF = \text{product of two numbers}$ . All this is to be embedded in contexts that bring out the significance and provide motivation to the child for learning these ideas.

##### (iii) *Whole numbers*

Natural numbers, whole numbers, properties of numbers (commutative, associative, distributive, additive identity, multiplicative identity), number line. Seeing patterns, identifying and formulating rules to be done by children. (*As familiarity with algebra grows, the child can express the generic pattern.*)

##### (iv) *Negative Numbers and Integers*

How negative numbers arise, models of negative numbers, connection to daily life, ordering of negative numbers, representation of negative numbers on number line. *Children to see patterns, identify and formulate rules.* What are integers, identification of integers on the number line, operation of addition and subtraction of integers, showing the operations on the number line (addition of negative integer reduces the value of the number) comparison of integers,

ordering of integers.

**(v) *Fractions:***

Revision of what a fraction *is*, Fraction as a part of whole, Representation of fractions pictorially and on number line), fraction as a division, proper, improper & mixed fractions, equivalent fractions, comparison of fractions, addition and subtraction of fractions (Avoid large and complicated unnecessary tasks). (Moving towards abstraction in fractions) Review of the idea of a decimal *fraction*, place value in the context of decimal *fraction*, inter conversion of fractions and decimal fractions (avoid recurring decimals at this stage), word problems involving addition and subtraction of decimals (two operations together on money, mass, length and temperature)

## **Algebra**

### **(i) Introduction To Algebra**

Introduction to variable through patterns and through appropriate word problems and generalizations (example  $5 \times 1 = 5$  etc.) Generate such patterns with more examples. Introduction to unknowns through examples with simple contexts (single operations)

### **(ii) Ratio and Proportion**

Concept of Ratio, Proportion as equality of two ratios, Unitary method (with only direct variation implied), Word problems

## **Geometry**

### **(i) Basic geometrical ideas (2 -D):**

Introduction to geometry. Its linkage with and reflection in everyday experience. Line, line segment, ray, Open and closed figures, Interior and exterior of *closed* Figures, Curvilinear and linear *boundaries*, Angle — Vertex, arm, interior and exterior, Triangle — vertices, sides, angles, interior and exterior, altitude and median, Quadrilateral — Sides, vertices, angles, diagonals, adjacent sides and opposite sides (only convex quadrilateral are to be discussed), interior and exterior of a quadrilateral. Circle — Centre, radius, diameter, arc, sector, chord, segment, semicircle, circumference, interior and exterior.

### **(ii) Understanding Elementary Shapes (2-D and 3-D):**

Measure of Line segment, Measure of angles, Pair of lines, Intersecting and perpendicular lines, Parallel lines, Types of angles- acute, obtuse, right, straight, reflex, complete and zero angle, *Classification* of triangles (*on the basis of* sides, and of angles) Types of quadrilaterals – trapezium, parallelogram, rectangle, square, rhombus. Simple polygons (*introduction*) (Upto octagons regulars as well as non regular). *Identification of* 3-D shapes: Cubes, Cuboids, cylinder, sphere, cone, prism (triangular), pyramid (triangular and square) Identification and locating in the surroundings, Elements of 3-D figures. (Faces, Edges and vertices), Nets for cube, cuboids, cylinders, cones and tetrahedrons.

### **(iii) Symmetry: (reflection)**

Observation and identification of 2-D symmetrical objects for reflection symmetry, Operation of reflection (taking mirror images) of simple 2-D objects, Recognizing reflection symmetry (identifying axes)

### **(iv) Constructions (using Straight edge Scale, protractor, compasses)**

Drawing of a line segment, Construction of circle, Perpendicular bisector, Construction of angles (using protractor), Angle  $60^\circ$ ,  $120^\circ$  (Using Compasses) Angle bisector- making angles of  $30^\circ$ ,  $45^\circ$ ,  $90^\circ$  etc. (using compasses), Angle equal to a given angle (using compass), Drawing a line perpendicular to a given line from a point a) on the line b) outside the line.

## **Mensuration**

### **Concept Of Perimeter And Introduction To Area**

Introduction and general understanding of *perimeter* using many shapes. Shapes of different kinds with the same perimeter, Concept of area, Area of a rectangle and a square, *Counter examples to different concepts related to perimeter and area*. Perimeter of a rectangle – and its special case – a square. Deducing the formula of the perimeter for a rectangle and then a square through pattern and generalization.

### **Data handling**

What is data - choosing data to examine a hypothesis? Collection and organization of data - examples of organizing it in tally bars and a table, Pictograph- Need for scaling in pictographs interpretation & construction. Making bar graphs for given data interpreting bar graphs+.

## **SAMPLE QUESTION PAPER**

### **Class VII**

### **MATHEMATICS**

**Time: 01 Hour**

**Max Marks: 100**

- (i) Answer all the questions on this sheet only.
- (ii) No separate sheet will be provided for rough work.
- (iii) Write neatly and briefly.
- (iv) Question 1 for 10 marks.
- (v) Question 2 to 15 carries 5 marks each.
- (vi) Question 16 to 17 carries 10 marks each.

Q. 1. Fill in the blanks: -

- (i) Roman numeral for 89 is .....
- (ii) A number which is even as well as prime is .....
- (iii) A straight angle measures.....degrees.
- (iv)  $\frac{3}{4} + \frac{1}{4} =$ .....
- (v) The smallest natural number is.....
- (vi) A Pyramid has.....vertices.
- (vii)  $50 : 30 :: 200 :$ .....
- (viii)  $(-7) - (-5) =$ .....
- (ix) If  $4m = 36$  then,  $m =$ .....
- (x) There are.....end points on a Ray.

Q. 2.

a) Write the numbers 14734, 13474, 17434, 14374 in ascending order.

b) Write the smallest and greatest five-digit numbers by using digits : 1, 7, 6, 2, 9. and find their difference.

Q. 3. Draw number line and on it show addition & subtraction of  $-5$  &  $-4$  .

Q. 4. If 8 pages are made from one sheet of a paper then how many note books, each having 200 pages can be made from 7500 such sheets of the paper.

Q 5. Compute the following: -

a)  $25.650 + 3.05 + 0.058$ .

b)  $4_3$

Q. 6. a) Find HCF of the following: - 70, 105, 175.

b) Find LCM of the following: - 24, 90, 50.

Q. 7. Use only scale and compass to draw angles of  $60^\circ$  &  $120^\circ$

Q. 8. Kriti and Kiran two friends have to share prize money of Rs. 25, 000 in the ratio of 2 : 3.  
Find the amount of money each will get.

Q. 9. Write the names according to Indian System & International System for the following numbers:

a) 254673 :-

b) 4657382 :-

Q. 10. Arrange the following fractions in descending order : -  $\frac{3}{8}, \frac{3}{4}, \frac{1}{2}$ .

Q. 11. Andrew takes 18 minutes to go round a circular track where as Max takes 12 minutes for the same. If two starts together then find after how many minutes both will be together at the starting point?

Q. 12. Draw a square with each side 5 cm. Then draw a line of symmetry for the square.

Q. 13. Ravi purchased 5kg 400 g of rice, 2 kg 20 g of sugar and 10 kg 850 g of flour. Find the total weight of the purchases made by Ravi.

Q. 14. In an election a successful candidate registered 5,77,500 votes where as his nearest rival received 3,48,700 votes. Find, by what margin, did he win the election. Also if 300 votes were declared invalid and a third candidate polled 3,500 votes then find the total number of voters.

Q. 15. A rectangular field with length 70 m and width 50 m is to be fenced with the barbed wire. If the cost of wire is Rs. 10 per meter and rate of fixing it up is Rs 5 per meter, then find the total cost of fencing the field.

16. Draw a Bar Graph for the following data :

ITEM	House Rent	food	Education	Electricity	Transport	Misc.
Expp	3000	3500	1000	500	500	2000

Q. 17. Calculate the area of the figure as shown below: -

(some shape which is combination of different rectangles)