SMETA MATHEMATICS OLYMPIAD
Syllabus Outline

Grades 1 - 2

Numbers and Counting: Recognizing numbers, understanding place value, and comparing numbers (greater/lesser).

Basic Operations: Simple addition and subtraction (single and two-digit numbers), introduction to multiplication through repeated addition, and understanding division as equal sharing.

Shapes and Geometry: Identifying common 2D shapes (circle, square, triangle, rectangle) and basic 3D shapes (cube, sphere).

Patterns and Sequences: Completing and extending patterns, identifying odd/even numbers, and skip counting by 2s, 5s, and 10s.

Measurement: Comparing objects based on length, weight, and capacity; reading time on the clock (to the hour and half-hour).

Data and Graphs: Reading simple pictographs and counting objects in categories.

Logical Thinking: Solving puzzles, finding missing numbers in sequences, and spotting differences or patterns.

SMETA MATHEMATICS OLYMPIAD
Syllabus Outline

Grades 3–4:

- **Number Concepts**: Numerals, number names, and number sense (up to 4-digit numbers).
- **Arithmetic Operations**: Addition, subtraction, multiplication, and division of whole numbers and simple fractions.
- **Patterns and Sequences**: Identifying and completing patterns, basic number sequences.
- **Geometry**: Recognition of basic shapes, understanding symmetry, and concepts of area and perimeter for simple figures.
- **Data Handling**: Reading and interpreting simple bar graphs and tables.
- **Logical Reasoning**: Basic problems involving analogy, classification, and grouping of figures.
- **Money**: Simple calculations involving coins and bills.
- **Word Problems:** Solving word problems with one or two steps.

SMETA MATHEMATICS OLYMPIAD
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GRADE 5-6

Arithmetic: Basic operations with whole numbers, decimals, fractions, and percentages. Introduction to mixed and improper fractions and their conversion.

Factors and Multiples: Identifying factors, prime factorization, finding HCF and LCM.

Geometry: Understanding basic shapes (square, rectangle, triangle), calculating perimeters and areas, and identifying angles (acute, right, and obtuse).

Mensuration: Estimating the volume of cubes and cuboids and applying measurements in real-world contexts.

Data Handling: Reading and interpreting bar graphs, pictographs, and pie charts; converting data from tables to graphs.

Patterns and Logical Thinking: Recognizing patterns in sequences and solving problems based on logical deductions.

Symmetry: Understanding lines of symmetry and mirror images.

SMETA MATHEMATICS OLYMPIAD
Syllabus Outline

GRADE 7–8

Number Systems: Integers, Rational Numbers, and their properties.
Fractions and Decimals: Operations, comparisons, and applications.
Exponents and Powers: Laws of exponents, standard form.
Algebra: Simple linear equations, algebraic expressions, and factorization.
Geometry:

- Lines and Angles: Types and properties.
- Triangles: Congruence, properties, and the Pythagoras theorem.
- Quadrilaterals and Polygons: Classification and properties.
- Mensuration: Perimeter, area of polygons, surface area, and volume of cubes, cuboids, and cylinders.

Data Handling: Bar graphs, pie charts, and probability basics.
Comparing Quantities: Ratios, percentages, and profit/loss.
Statistics: Mean, median, and mode.
Practical Geometry: Construction of triangles, perpendiculars, and bisectors.
Logical Reasoning: Patterns, series, and puzzles to enhance critical thinking.

SMETA MATHEMATICS OLYMPIAD
Syllabus Outline

GRADE 9 – 10

Algebra: Simplifying algebraic expressions, solving linear and quadratic equations, and understanding inequalities.

Geometry: Properties of triangles, circles, and polygons; congruence and similarity; and applications of Pythagoras' theorem.

Trigonometry: Basic trigonometric ratios, identities, and their applications in solving problems related to heights and distances.

Coordinate Geometry: Equations of straight lines, distance formula, section formula, and area of a triangle in a coordinate plane.

Statistics: Mean, median, mode, standard deviation, and graphical representation of data.

Probability: Basic concepts of probability, experiments, sample spaces, and simple events.

Mensuration: Surface area and volume of solids such as spheres, cones, and cylinders.

Number Theory: Prime numbers, divisibility, and basic modular arithmetic.

Logical Reasoning: Pattern recognition, series, sequences, and solving puzzles.

Applications: Real-life problem-solving using concepts like percentages, ratios, and proportions.

SMETA MATHEMATICS OLYMPIAD
Syllabus Outline

GRADE 11-12

Algebra and Functions

Polynomial functions, inequalities, systems of linear equations, quadratic equations, and matrices. Includes solving and applying higher-degree equations and inequalities.

Geometry and Trigonometry

Analytical geometry in 2D and 3D (circles, parabolas, ellipses, hyperbolas, and coordinate geometry). Trigonometric identities, equations, and properties of triangles.

Calculus

Basics of limits, continuity, differentiation, and integration. Application of derivatives (e.g., rates of change, optimization) and definite integrals (area under curves).

Probability and Statistics

Permutations, combinations, basic probability, binomial theorem, mean, variance, standard deviation, and normal distribution.

Number Theory

Prime numbers, divisors, congruences, and modular arithmetic. Includes advanced concepts like Fermat's Little Theorem and Euler's Totient Function.

Vectors and 3D Geometry

Vector algebra, dot and cross products, equations of lines, planes, and their intersections.

Complex Numbers

Representation in polar and rectangular forms, De Moivre's Theorem, and applications.

Logical Reasoning

Pattern recognition, series completion, and logical puzzles.