Section B: Math

1: Basics of Numbers, its extension and Logics
   1.1 Numbers and Numerals, Different Numeration Systems.
   1.2. Set and set operations (including theorems' proofs)
   1.3. Mathematical Logics (v, ∧, -, truth table, basic laws) and writing mathematical language
   1.4 Counting System: Combination and Permutation
   1.5 Real Number System and Algebra of complex numbers
   1.6 Sequence and Series
   1.7 Sum of finite natural numbers (n, n^2, n^3)
   1.8 Principle of mathematical induction and its applications

2: Basic Algebra and Its extension
   2.1. Transition from arithmetic to algebra
   2.2. Relations, Equivalance relations, Binary Operation and Group Structure
   2.3 Function, Graphs and Curve Tracing
   2.4 Polynomials and Rational Function (Relation between roots and coefficients)
   2.5 Exponential and Logarithmic Function
   2.6 Matrix (its inverse) and Determinants (its Properties)
   2.7 System of Linear (Cramer’s rule) and Quadratic Equations
   2.8 System of inequalities and LPP solutions
   2.9 Binomial expansions

3: Fundamental Trigonometry and Extension
   3.1 Trigonometric function and Unit Circle
   3.2 Radian and Degree Measure (circular measure)
   3.3 Solution of trigonometric equations
   3.4 Inverse Trigonometric function
   3.5 Properties of Triangles
   3.6 Sum, difference, multiple angles and product-sum formulae of trigonometric ratios
   3.7 DeMoivre’s theorem, nth roots and Euler’s formula

4: Euclidean and Analytic Geometry
   4.1 Fundamentals of Euclidean Geometry: History and development, fundamental properties of Euclidean geometry and axiomatic system
   4.2 Selected theorems on parallel lines, triangles, quadrilaterals and circles.
   4.3 Construction of triangle and quadrilateral
   4.4 Area and volume of plane and solid figure
   4.5 Analytic Geometry: History and development
   4.6 Distance formula, Equation of st. lines, Pairs of straight lines (Perpendicular and bisectors)
   4.7 Definitions and graphical representation of conic sections
4.8 Circles and related theorems and problems
4.9 General concept of Parabola, Ellipse and Hyperbola related

5: **Descriptive Statistics and Probability**
   5.1 Data generation (discrete and continuous data) and display of data. (Frequency Distribution and Graphical Representation)
   5.2 Cumulative frequency distribution (discrete and continuous data)
   5.3 Measure of Central tendency (AM, GM, HM)
   5.4 Measure of Dispersion (Range, MD, SD, Skewness, Kurtosis)
   5.5 Measure of correlation (Pearson, Spearman) and Regression Line
   5.6 Simple probability, exclusive and independent events, tree diagram
   5.7 Compound probabilities
   5.7 Binomial probability distribution and its properties

6: **Differential and Integral Calculus**
   6.1 Limit and continuity of functions and related problems
   6.2 Derivatives of functions and related problems
   6.3 Relation between derivatives and integration
   6.4 Integration of given function and related problems
   6.5 Application of derivatives and integration

7: **Vector and Its Application**
   7.1 Definition and representation of Vectors and different types of vectors
   7.2 Operation on vectors: addition, subtraction, and vector product (Scalar and Vector Product) with geometrical representations
   7.3 Vector Geometry (Line, triangles, quadrilaterals)
   7.4 Application of vectors (in Geometry, Trigonometry)

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### Subjective Question Plan (Specification Grid)

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<tr>
<th>Unit</th>
<th>Scope of Curriculum</th>
<th>Contentwise question weight</th>
<th>Full Marks</th>
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