Mathematics Syllabus

The syllabus is divided into three sections A, B and C. Section A is compulsory. You have a choice of attempting questions from either Section B or Section C.

There is one paper of three hours duration of 100 marks. Section A (80 marks) consists of nine questions. You are required to answer Question 1 (compulsory) and five out of the rest of the eight questions.

In Section B / C (20 marks), you are required to answer two questions out of three from either Section B or Section C.

SECTION A

1. Mathematical Reasoning

Mathematically acceptable statements. Connecting words / phrases – consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real life and Mathematics. Validating the statements involving the connecting words, differences between contradiction, converse and contrapositive.

2. Algebra

(i) Complex Numbers

(ii) Quadratic Equations

(iii) Finite and Infinite Sequences

(a) Arithmetic Progression (A.P.)

(b) Geometric Progression (G.P.)

(c) Harmonic Progression

(d) Arithmetico Geometric Series

(e) Special sums

(iv) Permutations Combinations

(v) Mathematical induction

Using induction to prove various summations and divisibility.

(vi) Binomial Theorem

(a) Significance of Pascal's triangle.

(b) Binomial theorem (proof using induction) for positive integral powers

(c) Binomial theorem for negative or fractional indices.

(vii) Properties of Binomial Coefficients.

3. Trigonometry

(i) Angles and Arc lengths

(ii) Trigonometric Functions

(iii) Compound and multiple angles

(iv) Trigonometric Equations

4. Calculus

(i) Basic Concepts of Relations and Functions

(a) Ordered pairs, sets of ordered pairs.

(b) Cartesian Product (Cross) of two sets, cardinal number of a cross product.

(c) Types of Relations: reflexive, symmetric, transitive and equivalence relation.

(d) Binary Operation.

(e) Domain, Range and Co-domain of a Relation.

(f) Functions

(ii) Differential calculus

(a) Limits

(b) Continuity

(c) Differentiation

(d) Application of derivatives

(iii) Integral Calculus

5. Coordinate Geometry

(i) Basic concepts of Points and their coordinates.

(ii) The straight line

(iii) Circles

6. Statistics

- Measures of central tendency.
- Standard deviation - by direct method, short cut method and step deviation method.
- Combined mean and standard deviation.

SECTION B

7. Vectors

8. Co-ordinate Geometry in 3-Dimensions

SECTION C

9. Statistics

- Median - direct and by using the formula.
- Quartiles - direct and by using the formula.
- Deciles - direct and by using the formula.
- Percentiles - direct and by using the formula.
- Mode - graphically, direct method and by using the formula.
- Estimation of median/quartiles from Ogives.

NOTE: The following are also required to be covered:

- The Median, Quartiles, Deciles and Percentiles of grouped and ungrouped data;
- Mode - grouped and ungrouped data; estimation of mode by using graphical method. (Bimodal data not included).

10. Average Due Date

- Zero date.
- Equated periods.