

APPENDIX-I
(The Scheme and Syllabus of Examination)

A. SCHEME OF EXAMINATION

1. The subjects of the written examination, the time allowed and the maximum marks allotted to each subject will be as follows: –

Subject	Code	Duration	Maximum Marks
Mathematics	01	2½ Hours	300
General Ability Test	02	2½ Hours	600
Total			900
SSB Test/Interview :			900

2. THE PAPERS IN ALL THE SUBJECTS WILL CONSIST OF OBJECTIVE TYPE QUESTIONS ONLY. THE QUESTION PAPERS (TEST BOOKLETS) OF MATHEMATICS AND PART “B” OF GENERAL ABILITY TEST WILL BE SET BILINGUALLY IN HINDI AS WELL AS ENGLISH.

3. In the question papers, wherever necessary, questions involving the metric system of Weights and Measures only will be set.

4. Candidates must write the papers in their own hand. In no circumstances will they be allowed the help of a scribe to write answers for them.

5. The Commission have discretion to fix qualifying marks in any or all the subjects at the examination.

6. The candidates are not permitted to use calculator or Mathematical or logarithmic table for answering objective type papers (Test Booklets). They should not therefore, bring the same inside the Examination Hall.

B. SYLLABUS OF THE EXAMINATION

PAPER-I
MATHEMATICS
(Code No. 01)
(Maximum Marks-300)

1. ALGEBRA

Concept of set, operations on sets, Venn diagrams. De Morgan laws, Cartesian product, relation, equivalence relation.

Representation of real numbers on a line. Complex numbers – basic properties, modulus, argument, cube roots of unity. Binary system of numbers. Conversion of a number in decimal system to binary system and vice-versa. Arithmetic, Geometric and Harmonic progressions. Quadratic

equations with real coefficients. Solution of linear inequations of two variables by graphs. Permutation and Combination. Binomial theorem and its applications. Logarithms and their applications.

2. MATRICES AND DETERMINANTS :

Types of matrices, operations on matrices. Determinant of a matrix, basic properties of determinants. Adjoint and inverse of a square matrix, Applications-Solution of a system of linear equations in two or three unknowns by Cramer's rule and by Matrix Method.

3. TRIGONOMETRY :

Angles and their measures in degrees and in radians. Trigonometrical ratios. Trigonometric identities Sum and difference formulae. Multiple and Sub-multiple angles. Inverse trigonometric functions. Applications-Height and distance, properties of triangles.

4. ANALYTICAL GEOMETRY OF TWO AND THREE DIMENSIONS:

Rectangular Cartesian Coordinate system. Distance formula. Equation of a line in various forms. Angle between two lines. Distance of a point from a line. Equation of a circle in standard and in general form. Standard forms of parabola, ellipse and hyperbola. Eccentricity and axis of a conic. Point in a three dimensional space, distance between two points. Direction Cosines and direction ratios. Equation two points. Direction Cosines and direction ratios. Equation of a plane and a line in various forms. Angle between two lines and angle between two planes. Equation of a sphere.

5. DIFFERENTIAL CALCULUS :

Concept of a real valued function-domain, range and graph of a function. Composite functions, one to one, onto and inverse functions. Notion of limit, Standard limits—examples. Continuity of functions—examples, algebraic operations on continuous functions. Derivative of function at a point, geometrical and physical interpretation of a derivative—applications. Derivatives of sum, product and quotient of functions, derivative of a function with respect to another function, derivative of a composite function. Second order derivatives. Increasing and decreasing functions. Application of derivatives in problems of maxima and minima.

6. INTEGRAL CALCULUS AND DIFFERENTIAL EQUATIONS :

Integration as inverse of differentiation, integration by substitution and by parts, standard integrals involving algebraic expressions, trigonometric, exponential and hyperbolic functions. Evaluation of definite integrals—determination of areas of plane regions bounded by curves—applications.

Definition of order and degree of a differential equation, formation of a differential equation by examples. General and particular solution of a differential equations, solution of first order and first degree differential equations of various types—examples. Application in problems of growth and decay.

7. VECTOR ALGEBRA :

Vectors in two and three dimensions, magnitude and direction of a vector. Unit and null vectors, addition of vectors, scalar multiplication of a vector, scalar product or dot product of two vectors. Vector product or cross product of two vectors. Applications—work done by a force and moment of a force and in geometrical problems.

8. STATISTICS AND PROBABILITY :

Statistics : Classification of data, Frequency distribution, cumulative frequency distribution—examples. Graphical representation—Histogram, Pie Chart, frequency polygon—examples. Measures of Central tendency—Mean, median and mode. Variance and standard deviation—determination and comparison. Correlation and regression.

Probability : Random experiment, outcomes and associated sample space, events, mutually exclusive and exhaustive events, impossible and certain events. Union and Intersection of events. Complementary, elementary and composite events. Definition of probability—classical and statistical—examples. Elementary theorems on probability—simple problems. Conditional probability, Bayes' theorem—simple problems. Random variable as function on a sample space. Binomial distribution, examples of random experiments giving rise to Binominal distribution.

PAPER-II
GENERAL ABILITY TEST
(Code No. 02)
(Maximum Marks – 600)

Part 'A' – ENGLISH **(Maximum Marks – 200)**

The question paper in English will be designed to test the candidate's understanding of English and workman like use of words. The syllabus covers various aspects like : Grammar and usage, vocabulary, comprehension and cohesion in extended text to test the candidate's proficiency in English.

Part 'B' – GENERAL KNOWLEDGE **(Maximum Marks – 400)**

The question paper on General Knowledge will broadly cover the subjects : Physics, Chemistry, General Science, Social Studies, Geography and Current Events.

- The syllabus given below is designed to indicate the scope of these subjects included in this paper. The topics mentioned are not to be regarded as exhaustive and questions on topics of similar nature not specifically