

**SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF  
HIGH SCHOOL TEACHER (MATHEMATICS) UNDER SCHOOL EDUCATION  
DEPARTMENT, GOVERNMENT OF MIZORAM, 2017**

**SUBJECTS**

- (a) General English (Conventional / Objective Type) ..... 100 Marks
- (b) Technical Paper - I (MCQ/Objective Type)..... 150 Marks
- (c) Technical Paper - II (MCQ/Objective Type)..... 150 Marks

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**GENERAL ENGLISH**

**(Full Marks : 100)**

- (a) Essay Writing (Conventional)..... 20 Marks
- (b) Idioms & Phrases (Objective Type)..... 16 Marks
- (c) Comprehension of given passages (Objective Type)..... 16 Marks
- (d) Grammar (Objective Type) ..... 16 Marks  
Parts of Speech : Nouns, Adjective, Verb, Adverb, Preposition, etc.
- (e) Composition (Objective Type)..... 16 Marks
  - i) Analysis of complex and compound sentences
  - ii) Transformation of sentences
  - iii) Synthesis of sentences
- (f) Correct usage and vocabularies (Objective Type) ..... 16 Marks

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## **Technical Paper – I (Marks – 150)**

### **General Aptitude - I**

**30 Marks**

Number and Problems on numbers, Divisibility test, Number series, Exponents and Radicals, Simplification, Average, Problem on ages, Time and Work, Pipes and Cisterns, Mixture or Alligation. Percentages, Profit and loss, Discount, Ratio and Proportion, Appreciation and Depreciation.

### **General Intelligence and Reasoning - I**

**20 Marks**

Series completion, Analogy, Classification, Coding – Decoding, Blood Relations, Puzzle Test, Sequential Output Tracing, Direction Sense Test, Logical Venn Diagram, Alphabet Test, Alpha – Numeric Sequence Puzzle, Logic, Statement – Arguments, Statement – Assumptions, Statement – Course of action, Statement – Conclusion, Analytical Reasoning, Mirror – Images, Water – Images, Spotting Out the Embedded Figures, Completion of Incomplete Pattern, Figure Matrix, Paper folding, Paper cutting. Rule Detection.

### **Basic Mathematics - I**

**40 marks**

Linear Equation in two variables, Quadratic Equations, Binary Number, Logarithm, Elementary Sets - I, Elementary Algebra –I, Elementary Geometry – I, Elementary Trigonometry - I, Height and Distances, Coordinate Geometry.

### **Probability and statistics**

**30 marks**

Multiplication theorem on probability, Conditional probability, independent events, total probability, Baye's theorem, Random variable and its probability distribution, Binomial distribution, Poisson's distribution. Measures of central tendency (Mean, median mode). Standard deviation, Correlation and regression.

### **Calculus**

**30 marks**

Function and graphs; definition of limits, standard theorems on limits and continuity. Definition of derivatives; Second order derivatives; application of derivatives. Rolle's theorem, mean value theorem and applications; partial derivatives; Euler's theorem on homogeneous functions.

Anti-derivatives: Evaluation of integrals from definition; fundamental theorem of integral calculus; properties of definite integrals, evaluation of integrals using properties.

## **Technical Paper – II (Marks – 150)**

### **Quantitative Aptitude -II**

**30 marks**

Time and Distance, Problem on Trains, Boats & Streams. Area, Volume & Surfaces, Clocks and Calendar, Simple interest, Compound interest, Sales tax, Partnership, Stock and Shares, Races And Game of Skill, Tabulation, Pie-chard, Bar Diagram, Line Graph, Data Interpretation.

### **General Intelligence and Reasoning – II**

**20 Marks**

Number, Ranking & Time Sequence Test, Mathematical Operations, Logical Sequence of Words, Arithmetical Reasoning, Inserting the missing Character, Data Sufficiency, Eligibility Test, Assertion and Reason, Situation Reaction Test, Verification of Truth of the statement, Deriving Conclusion from Passages, Theme Detection, Cause and Effect Reasoning, Grouping of Identical Figures, Cube and Dice, Dot Situation, Construction of Squares and Triangles, Figure Formation & Analysis.

### **Basic Mathematics - II**

**30 marks**

Elementary Sets - II, Elementary Algebra –II, Elementary Geometry – II, Elementary Trigonometry - II, Sequence and Arithmetical Progression, Geometric Progression, Harmonic Progression, Permutation, Combination.

### **Algebra**

**20 marks**

Matrices and Determinants, Binary Operations, Polynomials, degree of sum and product of Polynomials; the division algorithm; remainder theorem.

### **Linear Programming**

**10 marks**

Mathematical formulation of LPP, graphical method of solution for problems in two variables, simplex method of solution, duality in LPP.

### **Differential Equation**

**10 marks**

Formation of differential equation; Degree and Order solution of differential equations; linear equations with constant coefficients.

### **Vector Calculus and Geometry**

**10 marks**

Scalar and vector product; gradients, divergence and Curl of a vector field and Geometrical applications. Basic Geometry; Straight line, plane; conic sections (parabola, Hyperbola and ellipses)

## **Aptitude Test**

**20 Marks**

**a) Numerical and Figure work Test: (4 marks)**

These tests are reflections of fluency with numbers and calculations. It shows how easily a person can think with numbers. The subject will be given a series of numbers. His /Her task is to see how the numbers go together to form a relationship with each other. He /She has to choose a number which would go next in the series.

**b) Verbal Analysis and Vocabulary Tests (6 marks)**

These tests measure the degree of comfort and fluency with the English language. These tests will measure how a person will reason with words. The subject will be given questions with alternative answers that will reflect his /her command of the rule and use of English language

**c) Visual and Spatial/ 3-D Ability Tests (4 marks)**

These tests are used to measure perceptual speed and acuity. The subject will be shown pictures where he/she is asked to identify the odd one out; or which comes next in the sequence or explores how easily he/she can see and turn around objects in space

**d) Abstract and Reasoning Test: (6 marks)**

This test measures the ability to analyze information and solve problems on a complex, thought based level. It measures a person's ability to quickly identify patterns, logical rules and trends in new data, integrate this information, and apply it to solve problems