

Navajyothi College of Teacher Education for Women, Olarikkara, Thrissur

VAC.EDU.06-Fundamental Mathematics Skill for Competitive Exams

Contact Hours: 50 (Instruction)

Maximum Marks: 100 (Theory – 40; Practical-40, Internal-20)

Programme Outcomes:

Motivate for lifelong learning and continuing education for professional development

Course Learning Outcomes:

1. Strengthen Core Concepts:
 - Develop a deep understanding of basic mathematical concepts, which form the foundation for more complex problems encountered in competitive exams.
 - Ensure proficiency in key areas like arithmetic, algebra, geometry, trigonometry, and data interpretation.
2. Enhance Problem-Solving Skills:
 - Train students to approach problems methodically, using various techniques and strategies to solve them efficiently.
 - Encourage the use of shortcuts and tricks that are commonly tested in competitive exams to save time.
3. Improve Accuracy and Speed:
 - Focus on reducing the time taken to solve problems without compromising accuracy.
 - Implement timed practice sessions to build speed, a crucial factor in competitive exams.
4. Application of Mathematical Concepts:
 - Teach the application of mathematical principles to real-world problems, which are often tested in exams.
 - Foster the ability to translate word problems into mathematical equations and solutions.
5. Build Analytical and Logical Thinking:
 - Cultivate analytical thinking and logical reasoning skills through the practice of various mathematical problems.
 - Encourage the development of a structured approach to problem-solving.
6. Prepare for a Wide Range of Exam Patterns:
 - Equip students to handle different types of questions, including multiple-choice, descriptive, and data-based problems.
 - Familiarise with the specific exam patterns and question formats used in various competitive exams.
7. Boost Confidence through Practice:
 - Regular practice and mock tests to build confidence and reduce exam anxiety.
 - Provide opportunities to identify and work on weak areas before the actual exam.
8. Foster a Competitive Edge:
 - Help students gain an edge over others by mastering advanced topics and difficult problem types.
 - Encourage participation in group studies and discussions to enhance understanding and performance.
9. Encourage Continuous Learning and Improvement:
 - Instil a habit of regular study and continuous revision to keep concepts fresh.
 - Promote the use of error analysis to learn from mistakes and improve future performance.

SYLLABUS

1. Number System

- Natural Numbers
- Whole Numbers
- Integers
- Rational and Irrational Numbers
- Real Numbers
- Prime Numbers and Divisibility Rules
- LCM and HCF
- Fractions and Decimals

(10 hours)

2. Algebra

- Basic Algebraic Operations
- Simplification
- Algebraic Expressions and Identities
- Linear Equations in One and Two Variables
- Quadratic Equations
- Polynomials
- Progressions (Arithmetic and Geometric)

(10 hours)

3. Arithmetic

- Percentage
- Profit and Loss
- Discount
- Simple and Compound Interest
- Ratio and Proportion
- Averages
- Time and Work
- Time, Speed, and Distance

(10 hours)

4. Geometry

- Basic Geometrical Concepts (Lines, Angles, Triangles, etc.)
- Properties of Triangles, Quadrilaterals, and Circles
- Congruence and Similarity of Triangles
- Coordinate Geometry (Distance Formula, Section Formula, etc.)
- Area and Perimeter of Different Shapes
- Volume and Surface Area of Solids (Cubes, Cuboids, Cylinders, etc.)
- Theorems related to Triangles and Circles

(10 hours)

5. Mensuration

- Measurement of Length, Area, and Volume
- Area and Perimeter of Plane Figures (Square, Rectangle, Circle, etc.)
- Surface Area and Volume of Solids (Cube, Cuboid, Sphere, Cylinder, Cone, etc.)

(10 hours)

Mode of Transaction

Lecture, Demonstration, Discussion

Task and Assignments (Any two)

1. Collect previous year questions and answers in Chapter 1 and 2.
2. Collect previous year questions and answers in Chapter 3, 4 and 5.
3. Preparation of workbooks designed for competitive exam.

Evaluation System

1. Internal Evaluation (20 marks)

In the continuous evaluation mode the course provides the student-teacher to complete two tasks related to the course within the stipulated time. Each task is for ten marks and the split up of these 10 marks is as follows.

Sl. No.	Criteria	Marks
1	Timely Submission	2
2	Structure	6
3	Answering style	2
Total		10

2. Theory Examination

The theory examination is for a total of 40 marks. The question paper consists of only objective type 40 questions. Each question carries 1 mark. The minimum marks for pass is 20.

3. Practical Examination

The practical examination is for a total of 40 marks. The practical examination consists of 2 items each having 20 marks. The first item will be for the preparation of solving previous year questions and answers as homework. The second item includes the preparation of revise formulas, theorems and key concepts related to fundamental mathematics.