

NDA 2025 Exam Syllabus

The **NDA exam** consists of **two papers**:

□ **Paper-I: Mathematics (300 Marks)**

□ **Paper-II: General Ability Test (600 Marks)**

Paper-I: Mathematics (Code No. 01, Maximum Marks: 300)

1. Algebra

- Concept of sets, 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 number system: Conversion between decimal and binary.
- Arithmetic, Geometric, and Harmonic progressions.
- Quadratic equations with real coefficients.
- Linear inequalities with two variables (graphical solutions).
- Permutations and Combinations.
- Binomial theorem and its applications.
- Logarithms and their applications.

2. Matrices and Determinants

- Types of matrices, operations on matrices.
- Determinant of a matrix and its properties.
- Adjoint and inverse of a square matrix.
- Solving a system of linear equations using **Cramer's Rule** and **Matrix Method**.

3. Trigonometry

- Angles (degrees & radians), trigonometric ratios & identities.
- Sum and difference formulas, multiple and sub-multiple angles.
- Inverse trigonometric functions.
- Applications: Heights & distances, properties of triangles.

4. Analytical Geometry (2D & 3D)

- Cartesian coordinate system, distance formula.
- Equations of lines, angle between two lines, distance of a point from a line.
- Equation of a circle, parabola, ellipse, and hyperbola.

- Eccentricity and axes of conic sections.
- 3D Geometry: Distance between two points, direction cosines & ratios.
- Equations of planes and lines, angles between planes and lines.
- Equation of a sphere.

5. Differential Calculus

- Functions: Domain, range, graphs, composite functions, inverse functions.
- Limits and continuity.
- Differentiation: Basic rules, product/quotient rule, second-order derivatives.
- Increasing & decreasing functions, maxima & minima applications.

6. Integral Calculus & Differential Equations

- Integration as an inverse of differentiation.
- Standard integrals, integration by substitution & by parts.
- Definite integrals & applications (area under curves).
- Differential Equations: Order & degree, general & particular solutions.
- Applications in growth & decay problems.

7. Vector Algebra

- Vectors in 2D and 3D, magnitude & direction, unit and null vectors.
- Addition, scalar multiplication, dot & cross products.
- Applications in work, force, and geometry.

8. Statistics & Probability

- Data classification, frequency distribution, graphical representation (Histogram, Pie Chart, etc.).
- Measures of central tendency (Mean, Median, Mode), variance & standard deviation.
- Probability: Random experiments, sample space, events, classical & statistical probability.
- Bayes' Theorem, Binomial distribution.

Paper-II: General Ability Test (Code No. 02, Maximum Marks: 600)

Part A: English (200 Marks)

- Grammar and usage
- Vocabulary
- Comprehension

- Cohesion in extended texts

Part B: General Knowledge (400 Marks)

Section A: Physics

- Physical Properties of Matter: Mass, Weight, Volume, Density, Specific Gravity.
- Motion: Velocity, Acceleration, Newton's Laws, Force, Momentum.
- Heat & Thermodynamics: Measurement of heat, latent heat, heat transfer.
- Sound Waves & their properties, musical instruments.
- Optics: Reflection, Refraction, Spherical mirrors, Lenses, Human Eye.
- Electricity & Magnetism: Ohm's Law, circuits, X-rays.
- General Principles: Pendulums, Pulleys, Hydrometers, Pressure Cookers, Telescopes.

Section B: Chemistry

- Elements, Mixtures & Compounds.
- Properties of Air & Water, Hydrogen, Oxygen, Nitrogen, Carbon Dioxide.
- Acids, Bases, and Salts.
- Different Forms of Carbon.
- Everyday Chemistry: Fertilizers, Soap, Glass, Cement, Gunpowder.
- Atomic Structure, Molecular Weights, Valency.

Section C: General Science

- Living & Non-Living Things.
- Basis of Life: Cells, Protoplasm, Tissues.
- Human Body & Important Organs.
- Common Epidemics, Causes & Prevention.
- Food & Nutrition: Balanced Diet.
- Solar System, Meteors, Comets, Eclipses.
- Achievements of Eminent Scientists.

Section D: History & Freedom Movement

- Indian History: Culture & Civilization.
- Freedom Movement in India.
- Indian Constitution & Administration.
- Five-Year Plans, Panchayati Raj, Co-operatives.
- Concepts: Bhoodan, Sarvodaya, National Integration, Gandhi's Teachings.
- World History: Renaissance, Industrial Revolution, Russian Revolution.
- United Nations, Democracy, Socialism, India's Role in the World.

Section E: Geography

- Earth's Shape & Size, Latitudes & Longitudes, Time Zones.
- Earth's Movements & Effects, Origin of Earth.
- Rocks & Weathering, Earthquakes & Volcanoes.
- Ocean Currents, Tides, Atmosphere & Weather.
- Regional Geography of India: Climate, Natural Vegetation, Minerals, Industries.
- Major Sea Ports, Trade Routes, Exports & Imports.

Section F: Current Events

- Important National & International Events.
- Prominent Personalities (Indian & Global).
- Cultural, Sports, and Political Events.

Weightage of General Ability Test Sections

| Section | Topic | Approximate Weightage |
|---------|----------------------------|-----------------------|
| A | Physics | 25% |
| B | Chemistry | 15% |
| C | General Science | 10% |
| D | History & Freedom Movement | 20% |
| E | Geography | 20% |
| F | Current Affairs | 10% |

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