NDA Exam Pattern

The papers in both the subjects will consist of objective type questions only.

Subject	Duration	Marks
Mathematics	2 hours 30 minutes	300
General Ability Test	2 hours 30 minutes	600
	Total Marks	900
SSB Test/Interview		900

NDA Mathematics Syllabus

Algebra

- Concept of a 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 in-equations of two variables by graphs
- Permutation and Combination
- Binomial theorem and its application
- Logarithms and their applications

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

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

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

Differential Calculus

- Concept of a real valued function – domain
- range and graph of a function
- Composite functions
- Derivative of function at a point
- Derivatives of sum
- Product and quotient of functions
- Derivative of a function with respect of another function
- Derivative of a composite function
- Second order derivatives
- Increasing and decreasing functions
- Application of derivatives in problems of maxima and minima

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
- General and particular solution of a differential equation

Vector Algebra

- Vectors in two and three dimensions
- Magnitude and direction of a vector
- Unit and null vectors addition of vectors
- Scalar multiplication of vector

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
- 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.

NDA General Ability Test Syllabus

Part A – English

- Grammar and usage
- Vocabulary
- Comprehension and cohesion in extended text to test the candidate's proficiency in English.

Part B – General Knowledge

Question paper on General Knowledge broadly covers the subjects:

- Physics
- Chemistry
- General Science
- Social Studies
- Geography
- Current Events

Important note:

- The syllabus given below has designed to indicate the scope of these subjects included in this paper.
- The topics mentioned are not as exhaustive and questions on topics of similar nature not specifically mentioned in the syllabus may also be ask.
- Your answer has expected to show your knowledge and intelligent understanding of the subject.

Section A: Physics

- Physical Properties and States of Matter
- Mass
- Weight
- Volume
- Density
- Specific Gravity
- Principle of Archimedes
- Pressure Barometer
- Motion of objects
- Velocity and Acceleration
- Newton's Laws of Motion
- Force and Momentum
- Parallelogram of Forces
- Stability and Equilibrium of bodies
- Gravitation
- elementary ideas of work
- Power and Energy
- Effects of Heat
- Measurement of temperature and heat
- change of State and Latent Heat
- Modes of transference of Heat
- Sound waves and their properties
- Simple musical instruments

- Rectilinear propagation of Light
- Reflection and refraction
- Spherical mirrors and Lenses
- Human Eye
- Natural and Artificial Magnets
- Properties of a Magnet
- Earth as a Magnet
- Static and Current Electricity
- conductors and Non-conductors
- Ohm's Law Simple Electrical Circuits
- Heating
- Lighting and Magnetic effects of Current
- Measurement of Electrical Power
- Primary and Secondary Cells
- Use of X-Rays

Section B: Chemistry

- Physical and Chemical changes.
- Elements Mixtures and Compounds Symbols Formulae
- simple Chemical Equations Law of Chemical Combination (excluding problems)
- Properties of Air and Water
- Preparation and Properties of Hydrogen Oxygen Nitrogen and Carbondioxide Oxidation and Reduction
- Acids bases and salts
- Carbon – different forms
- Fertilizers – Natural and Artificial
- Material used in the preparation of substances like soap Glass Ink Paper Cement Paints Safety Matches and Gun-Powder
- Elementary ideas about the Structure of Atom Atomic Equivalent and Molecular Weights Valency

Section C: General Science

- Difference between the living and non-living
- Basis of Life – Cells Protoplasms and Tissues
- Growth and Reproduction in Plants and Animals
- Elementary knowledge of human Body and its important organs
- Common Epidemics their causes and prevention
- Food – Source of Energy for man
- Constituents of food Balanced Diet
- The Solar System – Meteors and Comets Eclipses
- Achievements of Eminent Scientists

Section D: History Freedom Movement etc

- Broad survey of Indian History with emphasis on Culture and Civilisation
- Freedom Movement in India
- Elementary study of Indian Constitution and Administration
- Elementary knowledge of Five Year Plans of India
- Panchayati Raj Co-operatives and Community Development
- Bhoodan Sarvodaya National Integration and Welfare State Basic Teachings of Mahatma Gandhi
- Forces shaping the modern world
- Renaissance Exploration and Discovery
- War of American Independence
- French Revolution Industrial Revolution and Russian Revolution
- Impact of Science and Technology on Society
- Concept of one World United Nations Panchsheel Democracy
- Socialism and Communism
- Role of India in the present world

Section E: Geography

- Earth its shape and size
- Latitudes and Longitudes Concept of time
- International Date Line
- Movements of Earth and their effects
- Origin of Earth
- Rocks and their classification
- Weathering
- Mechanical and Chemical Earthquakes and volcanoes
- Ocean Currents and Tides
- Atmosphere and its composition
- Temperature and Atmospheric Pressure Planetary Winds cyclones and Anti-cyclones
- Humidity
- Condensation and Precipitation
- Types of Climate
- Major Natural regions of the World
- Regional Geography of India
- Climate Natural vegetation
- Mineral and Power resources
- Location and distribution of agricultural and industrial activities
- Important Sea ports and main sea land and air routes of India
- Main items of Imports and Exports of India

Section F: Current Events

- Knowledge of Important events that have happened in India in the recent years
- Current important world events
- Prominent personalities – both Indian and International including those connected with cultural activities and sports.