NDA Exam Pattern & Syllabus 2022

- प्रारंभिक परीक्षा (Preliminary Examination)
- एसएसबी साक्षात्कार (SSB Interview)
- मेडिकल टेस्ट (Medical test)

एनडीए प्रारंभिक परीक्षा (Preliminary Examination)

Paper	Subjects	Maximum Marks	Time Duration
Paper-I	Mathematics	300	150 Min
Paper-II	GAT (General Ability Test)	600	150 min
Total		**900**	**300 Min (5 Hours)**

NDA Paper-I Mathematics Exam Pattern in Hindi

Paper	No of Question	Time Duration	Maximum Marks	Marks Per Question	Negative Marks Per Question
Mathematics	120	150 Min	300	2.5	0.83

NDA Mathematics Syllabus

बीजगणित (Algebra)

- Concept of set
- Operations on sets
- Venn diagrams
- De Morgan laws
- Binary system of numbers
- Representation of real numbers on a line
- Cartesian product, relation, equivalence relation
- Complex numbers—basic properties, modulus, argument, cube roots of unity
- Conversion of a number in decimal system to binary system and vice-versa

- Quadratic equations with real coefficients
- Arithmetic, Geometric and Harmonic progressions
- Permutation and Combination
- Solution of linear in equations of two variables by graphs
- Logarithms and their applications
- Binomial theorem and its applications

सदिश बीजगणित (Vector Algebra)

- Vectors in two and three dimensions
- Magnitude and direction of a vector
- Addition of vectors
- Unit and null 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

मैट्रिक्स और निर्धारक (Matrices & Determinants)

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

त्रिकोणमिति (Trigonometry)

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

दो और तीन आयामों की विश्लेषणात्मक ज्यामिति (Analytical Geometry of Two and Three Dimensions)

- Distance formula
- Rectangular Cartesian Coordinate system
- Angle between two lines
- Equation of a line in various forms

- 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
- Direction Cosines and direction ratios
- Point in a three dimensional space, distance between two points
- Equation two points
- Equation of a plane and a line in various forms
- Direction Cosines and direction ratios
- Angle between two lines and angle between two planes
- Equation of a sphere

अंतर कलन (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
- Derivatives of sum, product and quotient of functions, derivative of a function with respect to another function, derivative of a composite function
- Derivative of function at a point, geometrical and physical interpretation of a derivative—applications
- Application of derivatives in problems of maxima and minima
- Second order derivatives. Increasing and decreasing functions

समाकलन गणित और विभेदक समीकरण (Integral Calculus & Differential Equations)

- Integration as inverse of differentiation
- Integration by substitution and by parts
- Standard integrals involving algebraic expressions
- Trigonometric
- Hyperbolic functions
- Exponential
- Evaluation of definite integrals—determination of areas of plane regions bounded by curves— applications
- General and particular solution of a differential equations, solution of first order and first degree differential equations of various types—examples
- Definition of order and degree of a differential equation, formation of a differential equation by examples
- Application in problems of growth and decay

आंकड़े (Statistics)

- Classification of data

- Frequency distribution
- Cumulative frequency distribution—examples
- Measures of Central tendency—Mean, median and mode
- Graphical representation—Histogram, Pie Chart, frequency polygon—examples
- Correlation and regression
- Variance and standard deviation—determination and comparison

संभावना **(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

NDA Paper-II GAT (General Ability Test) Exam Pattern

Paper	No of Question	Time Duration	Maximum Marks	Marks Per Question	Negative Marks Per Question
GAT (General Ability Test)	150	150 Min	600	4	1.33

GAT (General Ability Test)

Section	Subject	Marks
Part-A	English	200
Part-B	Physics	100
	Chemistry	60

	General Science	40
	History	80
	Geography	80
	Current Affairs	40
Total		**600**

NDA Paper-II GAT (General Ability Test) Syllabus in Hindi

अंग्रेजी **(English)**

- Grammar and usage
- Vocabulary
- Comprehension and cohesion in extended text

भौतिक विज्ञान **(Physics)**

- Physical Properties and States of Matter, Mass, Weight, Volume, Density and Specific Gravity, Principle of Archimedes, Pressure Barometer
- Motion of objects
- Newton's Laws of Motion
- Velocity and Acceleration
- Force and Momentum
- Parallelogram of Forces
- Gravitation
- Stability and Equilibrium of bodies
- Effects of Heat
- Elementary ideas of work, Power and Energy
- change of State and Latent Heat
- Measurement of Temperature and 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
- Use of X-Rays
- Lighting and Magnetic effects of Current
- Measurement of Electrical Power
- Primary and Secondary Cells
- General Principles in the working of the following: Simple Pendulum, Simple Pulleys, Siphon, Levers, Balloon, Pumps, Hydrometer, Pressure Cooker, Thermos Flask, Gramophone, Telegraphs, Telephone, Periscope, Telescope, Microscope, Mariner's Compass; Lightening Conductors, Safety Fuses.

रसायन विज्ञान (Chemistry)

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

सामान्य विज्ञान (General Science)

- Difference between the living and nonliving
- Basis of Life—Cells, Protoplasm 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

इतिहास, स्वतंत्रता आंदोलन (**History, Freedom Movement**)

- A broad survey of Indian History, with emphasis on Culture and Civilization
- Freedom Movement in India
- Elementary knowledge of Five Year Plans of India
- Elementary study of Indian Constitution and Administration
- Bhoodan, Sarvodaya, National Integration and Welfare State, Basic Teachings of Mahatma Gandhi
- Panchayati Raj, Co-operatives and Community Development
- 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

भूगोल (**Geography**)

- The Earth, its shape and size
- Latitudes and Longitudes
- Concept of time
- International Date Line
- Origin of Earth
- Movements of Earth and their effects
- 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
- Land and air routes of India
- Important Sea ports and main sea
- Main items of Imports and Exports of India

वर्तमान घटनाएं **(Current Events)**

- Current National events
- Current World events
- Prominent personalities—both Indian and International
- Current cultural activities
- Sports