

*Success is born of action...*



**PIONEER ACADEMY™**

*For Competitive Examinations*

**UPSC**  
**NDA**

**INFORMATION BOOKLET**

**PUNE ACADEMY :**

204/5, 304/5, 2<sup>nd</sup> & 3<sup>rd</sup> Flr., Pinnacle Prestige, Above Cosmos Bank, Opp. Maharashtra Electronics, Tilak Road, Sadashiv Peth, Pune - 411 030

**Mob.: 9145339324 / 9145339325**

**THANE ACADEMY :**

201/202/203/204, 2<sup>nd</sup> Flr., Laizer Arcade, Raghoba Shankar Road, Chendani, Thane(W) - 400 601.

**Mob.: 8850837306 / 8928166732**

**ANDHERI ACADEMY :**

3<sup>rd</sup> Flr., Syndicate Chamber, Above Vaibhav Restaurant, Next To Better Home Hotel, Opp. Andheri (E) station, Andheri(E) - 400 601.

**Mob.: 9367041646 / 9324773854**

**DADAR ACADEMY :**

306/7/8, 3<sup>rd</sup> Flr., Blue Pearl Society, Senapati Bapat Road, Plot No. 14, Near Janata Cloth Market, Near Dadar Railway Station, Dadar (W), Mumbai - 400 028

**Mob.: 7715013830 / 9324169627**

**KALYAN ACADEMY :**

2<sup>nd</sup> Flr., Suyash Plaza, Opp. Railway Station, Near Deepak Hotel, Kalyan (W) - 421 301

**Mob.: 8591470467 / 8169140960**

**PIMPRI-CHINCHWAD ACADEMY :**

45, 3<sup>rd</sup> Flr., Kunal Plaza, Mumbai Pune Road, Chinchwad Station Road, Pimpri-Chinchwad - 411 019

**Mob.: 9975459324 / 9503459325**

**NERUL ACADEMY :**

16, 20 & 21, 1<sup>st</sup> Flr., Om Surya complex, Opp. Nerul Railway station, Beside Abhodaya Bank, Sector 15, Nerul (E), Navi Mumbai - 400 707

**Mob.: 9321287241 / 9321289027**

**BORIVALI ACADEMY :**

313/314, 3<sup>rd</sup> Flr., V Star Plaza, Chandavarkar Rd., Near Saraswat Bank, Sundar Nagar, Borivali (W), Mumbai - 400 092

**Mob.: 9653304874 / 9321249713**

**SATARA ACADEMY :**

Digvijay Building, 2<sup>nd</sup> Floor, Opp. S.T. Stand, Market Yard, Plot No. 13, Satara - 415 001

**Mob.: 74474 69324 / 25**

**ONLINE :**

301, Shivkrupa Commercial Complex, Thane - 400 602

**Mob.: 91375 41508**

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## AGE LIMIT

Age Limit is 16 ½ to 19 ½. (UPSC will declare age range for particular examination in respective Notification.)

## EDUCATIONAL QUALIFICATION

**For Army Wing of National Defence Academy :** 12th Class pass of the 10+2 pattern of School Education or equivalent examination conducted by a State Education Board or a University.

**For Air Force and Naval Wings of National Defence Academy and for the 10+2 Cadet Entry Scheme at the Indian Naval Academy :** 12th Class pass of the 10+2 pattern of School Education or equivalent with Physics and Mathematics conducted by a State Education Board or a University.

**Note 1:** Candidates appearing in the 11th class exam are not eligible for this examination

**Note 2:** Those candidates who have yet to qualify in the 12th class or equivalent examination and are allowed to appear in the UPSC Examination should note that this is only a special concession given to them.

## EXAM PATTERN

**STAGE I: MULTIPLE CHOICE TYPE OBJECTIVE EXAM** = 900 MARKS

Paper	Subject	Questions	Marks for every question	Marks	Negative marking	Duration
I	Maths	120	2.5	300	1/3	2.30 hours
II	General Ability	150	4	600	1/3	2.30 hours
	<b>Total</b>	270		900		

**STAGE II: SSB** = 900 MARKS

**Total Marks Allocated = 1800 MARKS**

## TIMETABLE OF EXAMINATION

Month of exam	Notification of exam	Month of SSB	Month of joining the Academy (course)
April	December	September-October	January
September	July	January-April	July

**Note :** The Date of Notification is liable to change.

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# PIONEER ACADEMY™

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## STAGE I : OBJECTIVE EXAMINATION - SYLLABUS

### PAPER-I- MATHEMATICS (Maximum Marks-300)

#### 1. ALGEBRA

Concept of 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 applications. Logarithms and their applications.

#### 2. 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.

#### 3. 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.

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

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

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## 6. 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. Evaluation of definite integrals-determination of areas of plane regions bounded by curves-applications. Definition of order and degree of a differential equation, formation of a differential equation by examples. General and particular solution of a differential equations, solution of first order and first degree differential equations of various types-examples. Application in problems of growth and decay.

## 7. VECTOR ALGEBRA

Vectors in two and three dimensions, magnitude and direction of a vector. Unit and null vectors, addition of 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.

## 8. 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. 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.

Mathematics subjects	Questions	Marks
Algebra + Vector Algebra	30	75
Trigonometry	20	50
Determinants and matrices	10	25
Analytical Geometry	20	50
Vector Algebra	10	25
Statistics and Probability	10	25
Differential Calculus and Integral calculus	20	50
<b>Total</b>	<b>120</b>	<b>300</b>

\*Values given in Table are based on analysis, may actually differ in examination.

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## PAPER-II GENERAL ABILITY TEST (Maximum Marks-600)

### Part 'A'-ENGLISH (Maximum Marks-200)

The question paper in English will be designed to test the candidate's understanding of English and workman like use of words. The syllabus covers various aspects like : Grammar and usage, vocabulary, comprehension and cohesion in extended text to test the candidate's proficiency in English.

### Part 'B'-GENERAL KNOWLEDGE (Maximum Marks-400)

The question paper on General Knowledge will broadly cover the subjects : Physics, Chemistry, General Science, Social Studies, Geography and Current Events.

#### Section 'A' (Physics)

Physical Properties and States of Matter, Mass, Weight, Volume, Density and 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. 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.

#### Section 'B' (Chemistry)

Physical and Chemical changes. Elements, Mixtures and Compounds, Symbols, 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. 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.

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## Section 'C' (General Science)

Difference between the living and non-living. 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.

## Section 'D' (History, Freedom Movement etc.)

A 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)

The 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.

General knowledge subjects	Questions	Marks
Physics	25	100
History	20	80
Geography	20	80
Chemistry	15	60
General Science	10	40
Current Events	10	40
<b>Total</b>	<b>100</b>	<b>400</b>

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## STAGE II : INTELLIGENCE AND PERSONALITY TEST (SSB)

The SSB procedure consists of two stage Selection process - stage I and stage II. Only those candidates who clear the stage I are permitted to appear for stage II. The details are :

1. Stage I comprises of Officer Intelligence Rating (OIR) tests are Picture Perception Description Test (PP&DT). The candidates will be shortlisted based on combination of performance in OIR Test and PP&DT.
2. Stage II Comprises of Interview, Group Testing Officer Tasks, Psychology Tests and the Conference. These tests are conducted over 4 days. These tests are conducted over 4 days.

The personality of a candidate is assessed by three different assessors viz. The Interviewing Officer (IO), Group Testing Officer (GTO) and the Psychologist. There are no separate weightage for each test. The marks are allotted by assessors only after taking into consideration the performance of the candidate holistically in all the test. In addition, marks for Conference are also allotted based on the initial performance of the Candidate in the three techniques and decision of the Board. All these have equal weightage.

The various tests of IO, GTO and Psych are designed to bring out the presence/absence of Officer Like Qualities and their trainability in a candidate. Accordingly candidates are Recommended or Not Recommended at the SSB.

## FINAL CUT OFF MARKS

Year	Exam	Mini. Marks required in each paper	Cutoff Marks for written stage	Finally recommended candidates marks
2018	NDA I	(25 %)	338 (37.55 %)	705 (78.33 %)
	NDA II	(25 %)	325 (36.00 %)	688 (76.00 %)
2017	NDA I	(25 %)	342 (38.00 %)	708 (39.33 %)
	NDA II	(25 %)	258 (28.66 %)	624 (34.66 %)
2016	NDA I	(25 %)	288 (32.00 %)	656 (36.44 %)
	NDA II	(20 %)	229 (25.44 %)	602 (33.44 %)
2015	NDA I	(30 %)	306 (34.00 %)	674 (37.44 %)
	NDA II	(25 %)	269 (29.88 %)	637 (35.38 %)
<b>Out of</b>			900 (100 %)	1800 (100 %)

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**Pioneer's Candidate  
Appearing in SSB**



**Mr. Gaurav Taware  
(Lieutenant)**

Mandar sir helped me at every stage of my preparation, because of his whole hearted support I could achieve this success.



**Mr. Kamrul Bassar  
(Lieutenant)**

The best coaching centre for NDA preparation. The teachers here are experienced. The quality of disciplined teaching is something to cherish and if the candidate works hard, the kind of guidance that is given here is a sure shot success mantra.



**Mr. Ganesh  
(Sub. Lieutenant)**

Thanks to Khandekar sir,  
Specially For SSB Guidance.  
Without Sir's Support it would  
be Difficult to Clear SSB.

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