

National Aviation Olympiad 2026

Olympiad Syllabus

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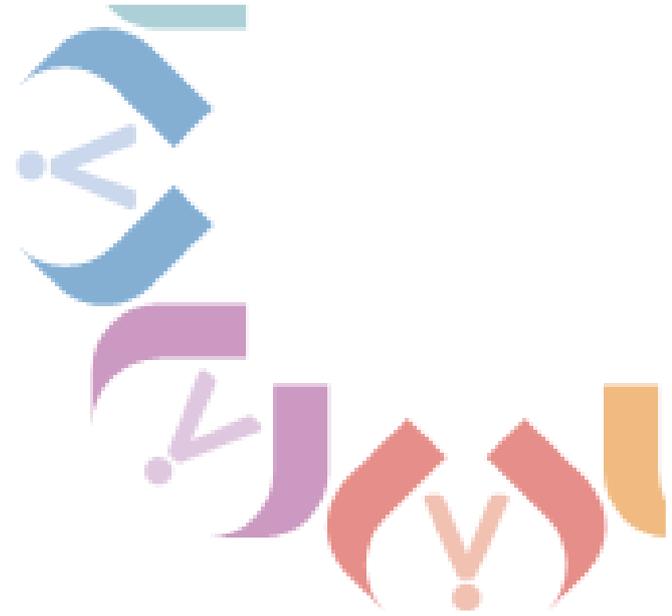
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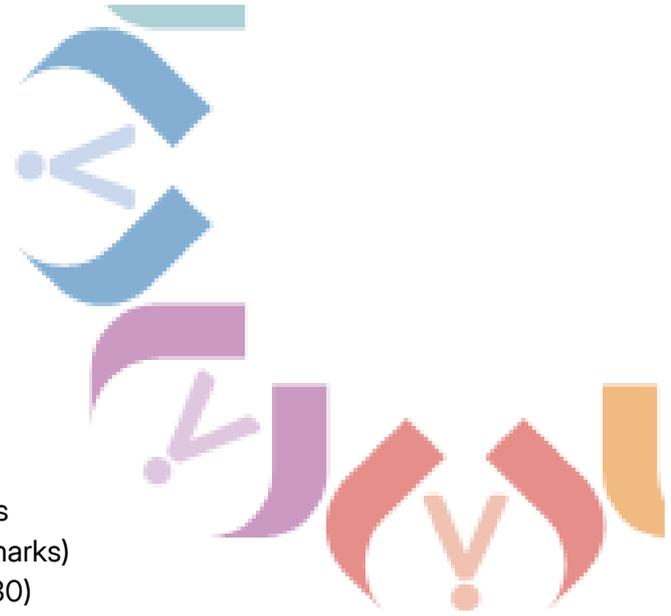
National Aviation Olympiad

Igniting young minds, elevating India's skies

1st Pan India Aviation Olympiad

Classes 8th - 12th

August 2026 - December 2026



1. OLYMPIAD SYLLABUS

1.1 Phase 1 - Middle School Syllabus (Grades 8–10)

1.1.1 Exam Format

- 60 Questions (MCQs + MSQs), 65 minutes, 90 marks
- **Section A:** Core Aviation (30 MCQ × 2 marks = 60 marks)
- **Section B:** STEM & Reasoning (30 MSQ × 1 mark = 30)
- Negative marking: 0.25 per wrong answer for MCQ, no deduction for skipped questions

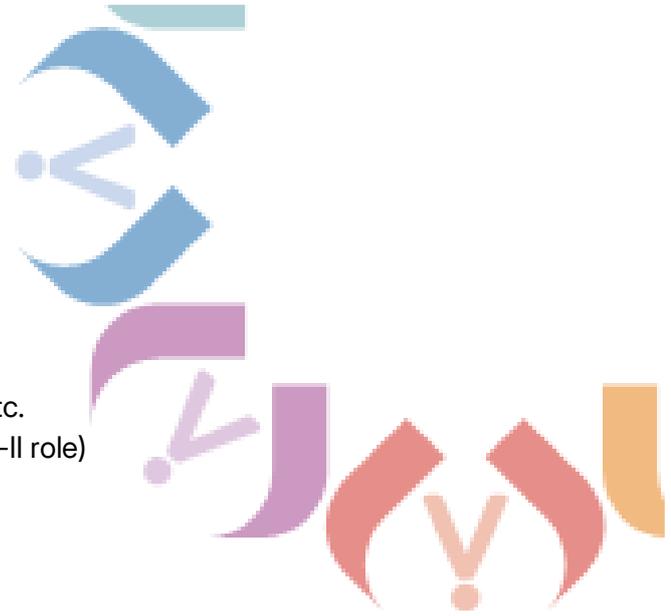
Difficulty Distribution:

Level	Percentage (%)
Easy	50% (30 questions)
Medium	30% (18 questions)
Difficult	20 % (12 questions)

1.1.2 Section A – Core Aviation (30 MCQs, 60 Marks)

[Easy (E)- 15 questions, Medium (M)- 9 questions, Difficult (D)- 6 questions]

- Basics of Flight (6 Questions)
 - Four forces of flight: lift, weight, thrust, drag
 - Bernoulli's principle (basic application in flight)
 - Newton's laws applied to flight
 - Simple aerodynamics experiments (paper planes)
- Aircraft Types & Engines (5 Questions)
 - Balloons, gliders, UAVs, drones, fixed-wing, rotorcraft
 - Piston vs jet engines (basic differences)
 - UAV classifications: Nano, Micro, Small (DGCA)
- Airports (3 Questions)
 - Airports in India
 - Airport layout basics: taxiway, terminal, apron
 - Takeoff and landing concepts (overview)
- Regulators (4 Questions)
 - FAA, EASA, DGCA, AAI, AAIB etc.
 - Airspace categories: Red, Yellow, Green
 - Basics of Civil Aviation Requirements (CAR)
 - Licenses in Aviation etc.



5. Aviation History (6 Questions)
 - Wright Brothers, JRD Tata, HAL foundation etc.
 - India's aviation milestones (early airlines, WW-II role)
6. Aviation Incidents (6 Questions)
 - Hindenburg disaster, Comet crashes
 - Tenerife disaster, Air India Flight 855
 - Key safety lessons from incidents

1.1.3 Section B – STEM & Reasoning (30 MSQs, 30 Marks)

[Easy (E)- 15 questions, Medium (M)- 9 questions, Difficult (D)- 6 questions]

1. Mathematics (10 Questions)
 - Number systems, LCM/HCF, prime factorization
 - Algebraic expressions & linear equations (1 variable)
 - Geometry: angles, polygons, circles
 - Mensuration: cube, cuboid, cylinder, cone
 - Trigonometry: simple heights & distances
 - Probability & statistics: mean, median, mode
2. Science
 - Physics (6 Questions)
 - Force, pressure, friction, buoyancy
 - Motion: uniform & non-uniform
 - Sound, light basics: reflection & refraction
 - Chemistry (4 Questions)
 - Matter & composition
 - Physical vs chemical changes
 - Metals & non-metals
 - Atomic structure (introductory)
 - Biology (4 Questions)
 - Respiration in humans & animals
 - Transport in plants & animals (link to oxygen/flight)
 - Tissues & diversity of organisms
 - Health & diseases basics
3. Reasoning (6 Questions)

- Series & number/letter coding
- Analogy & classification
- Direction sense & sequencing
- Visual reasoning

Section	Topic	Question	Marks	Difficulty		
				E	M	D
A – Core Aviation	Basics of Flight	6	12	3	3	0
	Aircraft Types & Engines	5	10	2	0	3
	Airports	3	6	2	1	0
	Regulators	4	8	2	1	1
	Aviation History	6	12	3	2	1
	Aviation Incidents	6	12	3	2	1
B – STEM & Reasoning	Mathematics	10	10	5	3	2
	Physics	6	6	3	1	2
	Chemistry	4	4	2	1	1
	Biology	4	4	4	0	0
	Reasoning	6	6	1	4	1
Total		60	90	30	18	12

1.2 Phase 1 – Higher School Syllabus (Grades 11–12)

1.2.1 Exam Format

- 60 Questions (MCQs + MSQs), 65 minutes, 90 marks
- **Section A:** Core Aviation (30 MCQ × 2 marks = 60 marks)
- **Section B:** STEM & Reasoning (30 MSQ × 1 mark = 30)
- Negative marking: 0.25 per wrong answer for MCQ, no deduction for skipped questions

Difficulty Distribution:

Level	Percentage (%)
Easy	50% (30 questions)
Medium	30% (18 questions)
Difficult	20% (12 questions)

1.2.2 Section A – Core Aviation (30 MCQs, 60 Marks)

[Easy (E)- 15 questions, Medium (M)- 9 questions, Difficult (M)- 6 questions]

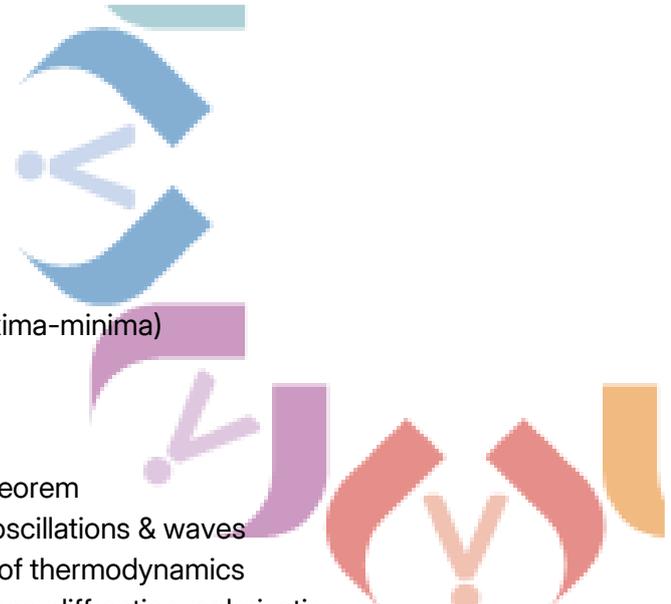
1. Flight Mechanics & Aerodynamics (8 Questions)
 - Four forces of flight: lift, weight, thrust, drag (advanced understanding)

- Bernoulli's principle & Newton's laws in aviation
 - Stability & control: pitch, roll, yaw
 - Stall, drag types, and lift-to-drag ratio (basic concept)
2. Aircraft Systems & Engines (5 Questions)
- Aircraft types: fixed-wing, rotorcraft, UAVs
 - Jet propulsion: turbojet, turbofan, ramjet, scramjet basics
 - Piston vs jet engines differences, basic turbine operations
 - Flight instruments: altimeter, gyroscope, compass, airspeed indicator
3. ATC & Meteorology (4 Questions)
- Air traffic control basics: communication & radar concepts
 - English in aviation (phraseology & communication)
 - Weather: thunderstorms, wind shear, visibility, icing conditions
4. Navigation & UAV Rules (4 Questions)
- Navigation aids: ILS, GPS, ADS-B, RNAV, FMS basics
 - UAV applications: agriculture, surveillance, logistics
 - UAV regulations: BVLOS, drone corridors, NPNT
5. Aviation Law (4 Questions)
- International Framework and ICAO
 - Indian Aviation Regulatory Structure
 - Safety, Liability and Environment Regulations
6. Aviation History & Case Studies (5 Questions)
- India: HAL, Air India, UDAN scheme, Open Sky Policy, LCC growth
 - Global incidents: Concorde crash, AF447, Hudson River Miracle, MH370
 - Lessons learned and safety improvements

1.2.3 Section B – STEM & Reasoning (30 MSQs, 30 Marks)

[Easy (E)- 15 questions, Medium (M)- 9 questions, Difficult (D)- 6 questions]

1. Mathematics (10 Questions)
- Sets, relations, functions
 - Sequences & series: AP, GP, binomial theorem intro
 - Coordinate geometry: straight lines, conic sections, 3D geometry
 - Vectors & vector applications
 - Probability: addition & multiplication theorems



- Basic calculus: limits & derivatives (rates, maxima-minima)
2. Science
- Physics (7 Questions)
 - Laws of motion in 2D, work-energy theorem
 - Gravitation, simple harmonic motion, oscillations & waves
 - Thermodynamics: heat engines, laws of thermodynamics
 - Optics: reflection, refraction, interference, diffraction, polarization
 - Modern physics: atomic structure, dual nature of matter, photoelectric effect
 - Chemistry (5 Questions)
 - Atomic structure, bonding, periodic table concepts
 - States of matter, chemical equilibrium
 - Thermodynamics & chemical kinetics basics
 - Acids, bases, salts; basic organic chemistry (hydrocarbons, biomolecules)
 - Biology (3 Questions)
 - Human physiology: respiration, circulation, nervous system (high-altitude adaptation)
 - Genetics & molecular biology: DNA, RNA, proteins, heredity
 - Evolution & environment/ecology
3. Reasoning (5 Questions)
- Data interpretation & analysis (aviation-related charts/tables)
 - Logical puzzles, analogies, sequences

Section	Topic	Question	Marks	Difficulty		
				E	M	D
A – Core Aviation	Flight Mechanics & Aerodynamics	8	16	4	2	2
	Aircraft Systems & Engines	5	10	3	0	2
	ATC & Meteorology	4	8	3	1	0
	Navigation & UAV Rules	4	8	2	2	0
	Aviation Law	4	8	1	2	1
	Aviation History & Case Studies	5	10	2	2	1
B – STEM & Reasoning	Mathematics	10	10	5	3	2
	Physics	7	7	2	3	2
	Chemistry	5	5	3	2	0
	Biology	3	3	3	0	0

	Reasoning	5	5	2	1	2
Total		60	90	30	18	12

1.3 Resources for reading:

- a. NCERT Science and Mathematics books from Grades 8th-12th.
- b. DGCA Publications
- c. FAA Publications
- d. EASA Publications
- e. NAO Booklet
- f. YouTube Channel of NAO for regular educational contents