NATIONAL AVIATION OLYMPIAD

National Aviation Olympiad 2026

Olympiad Syllabus

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Centre for Scientific Outreach
B1, Third Floor, Greater Kailash Enclave II, New Delhi - 110 048, India.

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NATIONAL AVIATION OLYMPIAD

National Aviation Olympiad

Igniting young minds, elevating India's skies

1st Pan India Aviation Olympiad

Classes 8th - 12th

August 2026 - December 2026

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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]

1. 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)

2. Aircraft Types & Engines (5 Questions)
    - Balloons, gliders, UAVs, drones, fixed-wing, rotorcraft
    - Piston vs jet engines (basic differences)
    - UAV classifications: Nano, Micro, Small (DGCA)

3. Airports (3 Questions)
    - Airports in India
    - Airport layout basics: taxiway, terminal, apron
    - Takeoff and landing concepts (overview)
4. Regulators (4 Questions)
    - FAA, EASA, DGCA, AAI, AAIB etc.
    - Airspace categories: Red, Yellow, Green
    - Basics of Civil Aviation Requirements (CAR)
    - Licenses in Aviation etc.

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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)

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- 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)

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- 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

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- 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

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	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

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