

International Science Olympiad (ISO)	International Maths Olympiad (IMO)
English International Olympiad (EIO)	General Knowledge International Olympiad (GKIO)
International Computer Olympiad (ICO)	International Drawing Olympiad (IDO)
National Essay Olympiad (NESO)	National Social Studies Olympiad (NSSO)
National Hindi Olympiad (NHO)	National Logical Reasoning Olympiad (NLRO)
Abacus Olympiad (AO)	Astronomy Space Olympiad (ASO)

Total Questions : 50

Time : 65 min



PATTERN & MARKING SCHEME

Section	Subjective	HOT'S (High Order Thinking Section)
No. of Questions	45	5
Marks per Ques.	1	1

SYLLABUS

Section - 1 : Gravitation and Orbital Mechanics, Kepler's Laws , Orbital and Escape Velocity, Lagrange Points, Stellar Physics, Black Holes, Neutron Stars, Observational Astronomy , Distance Measurement , Cosmology , Dark Matter and Energy, Space Missions, Gravitational Waves

Section - 2 : High Order Thinking Section - Syllabus as per Section 1

Astronomy Space

- If a satellite is in a stable circular orbit around the Earth, what provides the necessary centripetal force to keep it moving in a circle?
 - The satellite's rocket engines
 - The vacuum of space
 - Solar wind
 - The Earth's gravitational pull
- Kepler's Third Law establishes a mathematical relationship between which two properties of a planet's orbit?
 - Mass and Volume
 - Orbital period and Average distance from the Sun
 - Gravitational constant and Velocity
 - Rotation period and Surface temperature.
- How does the orbital velocity of a satellite change as its distance from the center of the Earth increases?
 - It increases.
 - It decreases.
 - It remains the same.
 - It fluctuates based on the satellite's mass.
- How many stable and unstable Lagrange points exist for a system of two large bodies, such as the Earth and the Sun?
 - 3
 - 9
 - 5
 - 2
- Fill in the blank:
The primary process that powers a star by fusing hydrogen atoms into helium in its core is called nuclear _____.
 - fission
 - combustion
 - fusion
 - decay

06. Identify the odd pair out based on how we detect or classify black holes:
- Cygnus X-1** — First widely accepted black hole.
 - Stellar-mass** — Formed by a collapsing massive star.
 - Supermassive** — Found at the center of galaxies.
 - Event Horizon Telescope** — Tool used to hear gravitational waves.
07. What is a "pulsar"?
- A star that changes color every few minutes.
 - A rapidly rotating neutron star that emits beams of electromagnetic radiation.
 - A planet that orbits a neutron star.
 - A type of telescope used to find black holes.
08. If the escape velocity of Earth is approximately 11.2 km/s, what would happen to a rocket launched at 8 km/s?
- It will escape Earth's gravity and enter deep space.
 - It will eventually fall back to Earth or enter into an orbit.
 - It will stop moving instantly once it reaches the upper atmosphere.
 - It will move in a straight line away from Earth forever.

High Order Thinking Section:

09. Evaluate these statements concerning optical telescopes used in astronomy:
- The light-gathering power of a telescope is directly proportional to the diameter of its objective lens or mirror.**
 - Chromatic aberration is a significant distortion found in reflecting telescopes but is absent in refracting telescopes.**
 - Increasing the magnification of a telescope beyond its "useful limit" results in a larger image but does not reveal more fine detail.**
 - Atmospheric "seeing" refers to the twinkling and blurring of stars caused by turbulence in Earth's atmosphere.**
- Which of the statements given above are correct?
- 1 and 2 only
 - 3 and 4 only
 - 1, 3, and 4 only
 - 1, 2, 3, and 4
10. **Assertion (A):** The distance between two celestial bodies is typically measured in light years rather than kilometres.
Reason (R): A light year is a unit of time that represents the time taken by light to travel from the Sun to the Earth.
- Both A and R are true and R is the correct explanation of A.
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.

ANSWER KEY: 1-d, 2-b, 3-b, 4-c, 5-c, 6-d, 7-b, 8-b, 9-c, 10-c