

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 Celestial Mechanics, Escape Velocity, Kepler's Laws, Tidal Forces and Tidal Locking, Stellar Astrophysics, Chandrasekhar Limit, Astronomical Measurements, Cosmology, Dark Matter and Dark Energy, Exoplanets, Spectroscopy and Space Technology, Modern Space Missions

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

Astronomy Space

- What happens to the orbital speed of a planet as it moves closer to the Sun in its orbit?
 - It slows down.
 - It speeds up.
 - It stops completely.
 - It remains constant.
- What is the minimum speed an object must reach to break free from a planet's gravity?
 - Terminal Velocity
 - Orbital Velocity
 - Escape Velocity
 - Light Speed
- According to Kepler's Third Law ($P^2 \propto a^3$) if a planet is 4 times further from the Sun than Earth, its orbital period will be:
 - 4 years
 - 8 years
 - 16 years
 - 64 years
- If a moon is "tidally locked" to its planet, what would an observer on the planet notice?
 - The moon rotates very quickly.
 - The moon appears to change its shape every hour.
 - The same side of the moon always faces the planet.
 - The moon has no gravity.
- The final "death" stage of a star (whether it becomes a White Dwarf, Neutron Star, or Black Hole) is determined by:
 - Its distance from Earth.
 - Its initial mass.
 - Its surface temperature.
 - Its color.

06. What is the approximate value of the Chandrasekhar Limit, which determines if a star will eventually become a white dwarf?
- 0.5 times the mass of the Sun.
 - 1.4 times the mass of the Sun.
 - 5.0 times the mass of the Sun.
 - 10.0 times the mass of the Sun.
07. A light-year is a measurement used to describe which of the following in space?
- The time it takes for light to travel to Earth.
 - The speed of a star moving through a galaxy.
 - The distance light travels in one year.
 - The brightness of a planet seen from Earth.
08. Fill in the blank:
The origin of the universe as a massive expansion from a single, extremely dense point roughly 13.8 billion years ago is explained by _____.
- the Big Bang Theory
 - the Steady State Theory
 - the Nebular Hypothesis
 - the Geocentric Model

High Order Thinking Section

09. Consider the following statements about the expansion of the universe:
Statement I: Dark Energy acts as a gravitational "glue" that helps galaxies cluster together in large structures.
Statement II: Dark Energy is thought to be a property of space itself that causes the expansion of the universe to accelerate.
Which of the following is correct?
- Statement I is the correct description of Dark Energy; Statement II describes Dark Matter.
 - Statement I is false; Statement II is true.
 - Both statements are true descriptions of how Dark Energy works.
 - Both statements are false.
10. An astronomer is analyzing the light from a star that is obscured by a large, cool cloud of interstellar gas. When the light passes through the cloud and reaches the telescope, what type of spectrum will be recorded, and what will it reveal about the cloud?
- A continuous spectrum that reveals the temperature of the cloud.
 - An emission spectrum showing bright lines that reveal the cloud's speed.
 - An absorption spectrum showing dark lines that reveal the cloud's chemical elements.
 - A blackbody spectrum that proves the cloud is reflecting light from Earth.

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