

UNIQUE STUDY POINT

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Class: VI	Subject: Science	Session: 2025-26
Chapter: 12 - Beyond Earth	Time: 1½ Hours	Max. Marks: 40

General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five sections A, B, C, D and E.
3. Section A contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

SECTION A - Multiple Choice Questions (1 mark each)

Q1. Which star is closest to Earth?

- (a) Sirius
- (b) Proxima Centauri
- (c) The Sun
- (d) Polaris

Q2. The Pole Star is part of which constellation?

- (a) Ursa Major
- (b) Ursa Minor
- (c) Orion
- (d) Canis Major

Q3. Which planet is known as the "Morning Star" or "Evening Star"?

- (a) Mars
- (b) Mercury
- (c) Venus
- (d) Jupiter

Q4. How many planets are there in our Solar System?

- (a) 7
- (b) 8
- (c) 9
- (d) 10

Q5. The brightest star in the night sky is:

- (a) Polaris
- (b) Sirius

- (c) Betelgeuse
- (d) Aldebaran

Q6. Which of the following is NOT a member of our Solar System?

- (a) Asteroids
- (b) Comets
- (c) Sirius
- (d) Moon

Q7. The Earth revolves around the Sun in approximately:

- (a) 24 hours
- (b) 27 days
- (c) One month
- (d) One year

Q8. Which planet is called the "Red Planet"?

- (a) Mercury
- (b) Venus
- (c) Mars
- (d) Jupiter

Q9. The Moon takes approximately how many days to complete one revolution around Earth?

- (a) 24 days
- (b) 27 days
- (c) 30 days
- (d) 365 days

Q10. Our Solar System is part of which galaxy?

- (a) Andromeda Galaxy
- (b) Milky Way Galaxy
- (c) Whirlpool Galaxy
- (d) Sombrero Galaxy

SECTION B - Short Answer Questions (2 marks each)

Q11. What are constellations? Give two examples.

Q12. Differentiate between stars and planets.

Q13. Why is Venus hotter than Mercury even though it is farther from the Sun?

Q14. What is light pollution? How does it affect night sky observation?

SECTION C - Short Answer Questions (3 marks each)

Q15. Explain how the Pole Star can be used to locate the North direction. Draw a simple diagram to support your answer.

Q16. What are comets? Describe their composition and what happens when they approach the Sun.

Q17. List three differences between the inner planets and the outer planets of our Solar System.

SECTION D - Long Answer Question (5 marks)

Q18. Write a detailed note on the Moon, covering the following points:

- (i) Distance from Earth
- (ii) Size compared to Earth
- (iii) Surface features
- (iv) Revolution period
- (v) India's Chandrayaan missions

SECTION E - Case Study Based Questions (4 marks each)

Q19. Case Study 1: Night Sky Observation

Rohan lives in a village with clear dark skies. One night, he observed the sky and noticed a bright band of light stretching across the sky. His grandfather told him it was the Milky Way Galaxy. Rohan also noticed that some bright points appeared to twinkle while others shone steadily. He used a mobile app to identify that the steady ones were actually planets.

Based on the above passage, answer the following questions:

- (a) Why could Rohan see the Milky Way clearly from his village? (1 mark)
- (b) Why do stars twinkle but planets do not? (1 mark)
- (c) What is the Milky Way Galaxy? (1 mark)
- (d) Name two planets that can be seen with the naked eye. (1 mark)

Q20. Case Study 2: Solar System Exploration

Scientists use various space missions to explore our Solar System. India's space organization ISRO has made significant contributions. The Chandrayaan-3 mission successfully landed near the Moon's south pole on 23 August 2023, making India the first country to achieve this feat. The mission included a lander named Vikram and a rover named Pragyan. The date is now celebrated as National Space Day in India.

Based on the above passage, answer the following questions:

- (a) When is National Space Day celebrated in India? (1 mark)
- (b) What were the names of the lander and rover in Chandrayaan-3? (1 mark)
- (c) What unique achievement did Chandrayaan-3 accomplish? (1 mark)
- (d) Why is space exploration important for humanity? (1 mark)

SECTION A - Answers to MCQs

Ans 1. (c) The Sun

The Sun is the closest star to Earth at approximately 150 million km away.

Ans 2. (b) Ursa Minor

The Pole Star (Polaris) is part of the Little Dipper, which lies in the constellation Ursa Minor.

Ans 3. (c) Venus

Venus is commonly called the Morning Star or Evening Star because it shines brightly at dawn and dusk.

Ans 4. (b) 8

There are 8 planets in our Solar System: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

Ans 5. (b) Sirius

Sirius, located in the constellation Canis Major, is the brightest star in the night sky.

Ans 6. (c) Sirius

Sirius is a star outside our Solar System. The Solar System consists of the Sun, planets, moons, asteroids, and comets.

Ans 7. (d) One year

Earth completes one revolution around the Sun in approximately 365 days or one year.

Ans 8. (c) Mars

Mars is called the Red Planet because its soil is reddish in color, making it appear red.

Ans 9. (b) 27 days

The Moon takes approximately 27 days to complete one revolution around Earth.

Ans 10. (b) Milky Way Galaxy

Our Solar System is part of the Milky Way Galaxy, also known as Ākāśha Gangā.

SECTION B - Answers to Short Answer Questions

Ans 11. What are constellations? Give two examples.

Constellations: Constellations are regions of the sky that include groups of stars appearing to form recognizable patterns. These patterns were identified by ancient civilizations and associated with animals, objects, or characters from stories.

Examples:

- (i) **Orion** - Often represented as a hunter with three stars forming his belt
- (ii) **Ursa Major** - Contains the Big Dipper pattern, known as Saptarīṣhi in India

Ans 12. Differentiate between stars and planets.

Differences between stars and planets:

Stars	Planets
Stars shine with their own light	Planets reflect sunlight
Stars appear to twinkle	Planets do not twinkle

Ans 13. Why is Venus hotter than Mercury even though it is farther from the Sun?

Venus is hotter than Mercury despite being farther from the Sun because Venus has a thick atmosphere that traps heat through the greenhouse effect. This atmosphere prevents heat from escaping, making Venus extremely hot. Mercury, on the other hand, has almost no atmosphere, so it cannot trap heat effectively, resulting in lower temperatures compared to Venus.

Ans 14. What is light pollution? How does it affect night sky observation?

Light Pollution: The presence of excessive artificial light at night time is referred to as light pollution.

Effects on night sky observation:

- (i) Light pollution makes the night sky less clear and reduces visibility of stars
- (ii) Only a few bright stars can be seen in cities with high light pollution
- (iii) It prevents us from enjoying and studying celestial objects properly
- (iv) Dark sky reserves have been established to preserve areas with minimal light pollution for better observation and research

SECTION C - Answers to Short Answer Questions

Ans 15. Explain how the Pole Star can be used to locate the North direction. Draw a simple diagram to support your answer.

Method to locate North direction using Pole Star:

1. First, identify the Big Dipper constellation in the northern part of the sky
2. Look at the two stars at the end of the Big Dipper's cup
3. Imagine a straight line passing through these two stars towards the north
4. Extend this line to about five times the distance between these two stars
5. This imaginary line will lead to the Pole Star (Polaris)
6. The Pole Star appears stationary and always indicates the North direction

Diagram: [A simple diagram showing the Big Dipper with two pointer stars, an arrow extending to the Pole Star, and a label indicating "North Direction"]

Note: The Pole Star is particularly useful for navigation in the Northern hemisphere.

Ans 16. What are comets? Describe their composition and what happens when they approach the Sun.

Comets: Comets are visitors from the outer regions of the Solar System with long tails. They are celestial objects that revolve around the Sun.

Composition: Comets are made up of dust, gases, rocks, and ice.

When comets approach the Sun:

- (i) The frozen material in the comet starts evaporating due to the Sun's heat
- (ii) This evaporating material forms the characteristic long tail of the comet
- (iii) The tail always points away from the Sun
- (iv) As comets move away from the Sun, they appear dim and eventually become invisible to the naked eye

Examples: Halley's Comet appears every 76 years. In Indian languages, comets are called Dhūmaketu.

Ans 17. List three differences between the inner planets and the outer planets of our Solar System.

Differences between inner and outer planets:

Inner Planets	Outer Planets
1. Smaller in size (Mercury, Venus, Earth, Mars)	1. Much larger in size (Jupiter, Saturn, Uranus, Neptune)
2. Have solid surfaces with rocks	2. Mostly made of gases (giant gaseous planets)
3. Do not have ring-like structures	3. Have large flat ring-like structures made of dust and rocky material

SECTION D - Answer to Long Answer Question

Ans 18. Write a detailed note on the Moon, covering all given points.

THE MOON - EARTH'S NATURAL SATELLITE

(i) Distance from Earth:

The Moon is approximately 3,84,000 km away from Earth. It is our nearest neighbor in space.

(ii) Size compared to Earth:

The Moon is about a quarter (1/4th) the size of Earth in diameter. This makes it relatively large compared to most other moons in our Solar System when compared to their parent planets.

(iii) Surface features:

- The Moon's surface shows circular bowl-like structures called craters
- Most craters have been formed due to impacts of asteroids or rocks from space hitting the Moon's surface
- Since there is no atmosphere, water, or life on the Moon, these features remain preserved for very long periods
- The Moon has no air or light pollution, making its surface clearly visible from Earth

(iv) Revolution period:

The Moon takes approximately 27 days to complete one revolution around Earth. During this time, different portions of the Moon become visible from Earth, creating the phases of the Moon.

(v) India's Chandrayaan missions:

- **Chandrayaan-1** - India's first mission to the Moon, launched in 2008
- **Chandrayaan-2** - Second mission launched in 2019
- **Chandrayaan-3** - Launched in July 2023, successfully achieved soft-landing on 23 August 2023 near the Moon's south pole
- The Vikram lander and Pragyan rover were part of Chandrayaan-3
- India became the first country to land near the Moon's little-explored south pole
- 23 August is now celebrated as National Space Day in India
- **Chandrayaan-4** is being planned to bring back soil and rock samples from the Moon

These missions have significantly improved our understanding of the Moon and established India as a major player in space exploration.

SECTION E - Answers to Case Study Based Questions

Ans 19. Case Study 1: Night Sky Observation

(a) Why could Rohan see the Milky Way clearly from his village?

Rohan could see the Milky Way clearly from his village because there was minimal light pollution in the rural area. Villages have less artificial lighting compared to cities, providing clear dark skies that allow better visibility of celestial objects.

(b) Why do stars twinkle but planets do not?

Stars appear to twinkle because they are very far away and appear as point sources of light. Their light is affected by Earth's atmosphere. Planets do not twinkle because they are much closer to Earth and appear as small discs rather than points, making their light more stable.

(c) What is the Milky Way Galaxy?

The Milky Way Galaxy, also known as Ākāśha Gangā, is our home galaxy. It appears as a faint band of light stretching across the night sky. A galaxy contains millions to billions of stars, and our Solar System is part of the Milky Way Galaxy.

(d) Name two planets that can be seen with the naked eye.

Two planets that can be seen with the naked eye are:

- Venus - The brightest planet, easily visible at dawn or dusk
- Jupiter - Also bright and easily visible without a telescope

(Other acceptable answers: Mars, Saturn, Mercury)

Ans 20. Case Study 2: Solar System Exploration

(a) When is National Space Day celebrated in India?

National Space Day is celebrated on 23 August every year in India, marking the successful landing of Chandrayaan-3 on the Moon's south pole on this date in 2023.

(b) What were the names of the lander and rover in Chandrayaan-3?

The names were:

- Vikram - the lander
- Pragyan - the rover

(c) What unique achievement did Chandrayaan-3 accomplish?

Chandrayaan-3 made India the first country in the world to achieve a soft-landing near the Moon's little-explored south pole. This region had not been successfully explored before by any other nation.

(d) Why is space exploration important for humanity?

Space exploration is important for humanity because:

- (i) It helps us understand celestial bodies and the universe better
- (ii) It leads to technological advancements that benefit life on Earth
- (iii) It helps identify resources that might be useful in the future
- (iv) It answers fundamental questions about our existence and the possibility of life elsewhere
- (v) It inspires scientific curiosity and innovation in young generations

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