

Chapter 18. Our universe Living science question with answer

A. MULTIPLE-CHOICE QUESTIONS: Choose the most appropriate answer.

1. A galaxy such as the Milky Way contains
 - a. a few thousand stars.
 - a. a few million stars.
 - c. a few billion stars.
 - d. only a few thousand stars but millions of planets.
2. The distance of the star Proxima Centauri from the Earth is
 - a. 4.3 million kilometres.
 - b. $8\frac{1}{4}$ light minutes.
 - c. 2 million light years.
 - d. 4.3 light years.
3. The Pole Star is in the constellation of
 - a. Ursa Major.
 - b. Ursa Minor.
 - c. Orion.
 - d. Scorpius.
4. The solar system consists of
 - a. the Sun and the planets only.
 - b. the Sun, the planets and their moons.
 - c. the Sun, the planets, their moons and all other celestial objects that revolve around the Sun
 - d. all the stars in the Milky Way.
5. The hottest planet in the solar system is
 - a. Mars.
 - b. Sun.
 - c. Mercury.
 - d. Venus.
6. The large number of rocks that lie between the orbits of Mars and Jupiter are called
 - a. comets.
 - b. asteroids.
 - c. meteors.
 - d. meteorites.
7. Artificial satellites are sent in space by scientists because
 - a. they look beautiful in the sky.
 - b. every country wants to break the record of the largest number of satellites sent.
 - c. they serve as stopovers for people going to the Moon.
 - d. they are useful in communication, forecasting weather, locating minerals and in studying outer space.
8. The Sun is located at
 - a. the centre of the solar system.
 - b. the centre of the Milky Way.
 - c. the centre of the universe.
 - d. none of these

Answer: 1. c 2. d 3. a 4. c 5. d 6. b 7. d 8. a

B. VERY SHORT-ANSWER QUESTIONS: Give one-word answers.

1. What are scientists who study the universe called?
2. Which galaxy do we live in? 3. Stars are made up of rocks. True or false?
4. The Sun is hottest at its outer surface. True or false?
5. What is the distance that light travels in one year called?
6. The stars in a constellation are actually very close to each other. True or false?
7. The constellation Big Dipper is known by another name also. What is it?
8. The stars in which constellation form the shape of a hunting man?
9. Name these:
 - a. largest planet
 - b. planet closest to the Sun
 - c. the 'red' planet
 - d. planet farthest from the Earth
 - e. the hottest planet
 - f. planet with high percentage of carbon dioxide in its atmosphere
10. Name the largest asteroid.
11. Which comet can be seen after every 76 years?
12. Which was the first artificial satellite of the Earth?

13. Which satellite was sent first into space by India?

Answer: 1. Astronomers 2. Milky Way 3. False 4. False 5. Light year 6. False 7. Great Bear 8. Orion 9. (a) Jupiter (b) Mercury (c) Mars (d) Neptune (e) Venus (f) Venus 10. Ceres (diameter 1003 km) 11. Halley's Comet 12. Sputnik - I 13. Aryabhata

C. SHORT-ANSWER QUESTIONS (TYPE I): Answer in a sentence or two.

1. While looking up at the sky, how can you distinguish between a planet and a star?

Ans: While looking up at the sky, we can distinguish between a planet and a star by observing their twinkling nature. Stars twinkle at night sky whereas planets do not.

2. What is the solar system?

Ans: The Sun, the eight planets, their moons and the other celestial objects that revolve around the Sun form the solar system.

3. Why do stars give out heat and light?

Ans: Stars are huge spinning balls of hot luminous gases. In the centre of the stars, hydrogen atoms combine to form helium atoms. During this process, huge amount of energy is released in the form of heat and light.

4. Which property of the Pole Star makes it very useful for sailors?

Ans: Sailors used the Pole Star to find the north direction because it is the only star that remains stationary in the sky with respect to the earth.

5. Why was it necessary to define a new unit to measure distances in the universe? What is this unit?

Ans: The distances between heavenly bodies in space are very, very large. Measuring these distances in kilometres would mean dealing with very large numbers. Astronomers, therefore, use special units to measure distances in space. Instead of a kilometre, they use a unit called light year. A light year is the distance that light travels in one year.

6. Why is Mercury very hot during the day and very cold at night?

Ans: Mercury is very hot during the day (about 400 °C). Its gravitational force is not strong enough to hold an atmosphere. Due to the absence of an atmosphere, the heat is quickly lost at night, and it becomes freezing cold (about - 200 °C).

7. What is the most distinctive feature of Saturn?

Ans: Three wide rings surround Saturn planet. These rings are not visible with the naked eyes but can be seen only with the help of a telescope. These rings are made of ice and dust. This is the most distinctive feature of Saturn.

8. What is the difference between meteors and meteorites?

Ans: Meteors are small objects made up mainly of stones present in space. They regularly enter the earth's atmosphere. As a meteor enters the earth's atmosphere at high speed, it is heated by friction with air, and in most cases it burns to ashes in a very short time. If a meteor is large, it may fall on the earth's surface before being completely burnt out. Such meteors are called meteorites.

D. SHORT-ANSWER QUESTIONS (TYPE II): Answer in about 30 words.

1. Both galaxies and constellations are groups of stars. Give two differences between them.

Ans: (i) A group of billions of stars make up a galaxy. Whereas a small group of stars that appear to form an imaginary pattern when viewed from the earth is known as constellation.

(ii) Our solar system is in the galaxy called the Milky Way whereas some important constellations are Ursa Major, Ursa Minor, Orion, Cassiopeia, etc.

2. How can you locate the Pole Star with the help of Ursa Major?

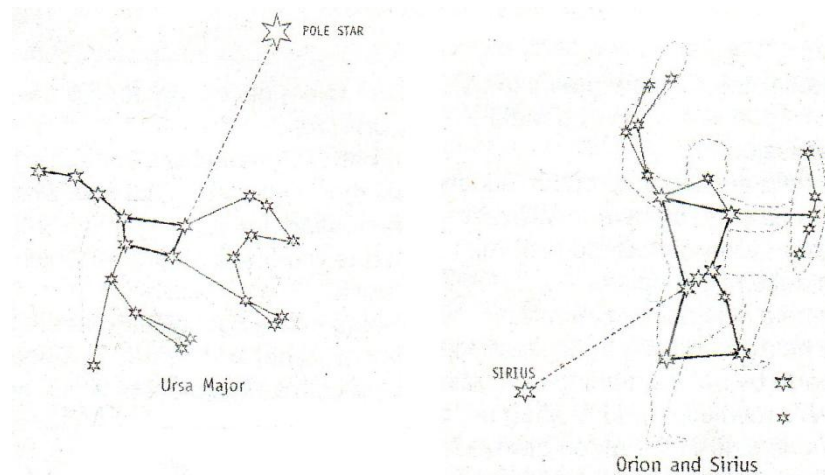
Ans: We can locate the Pole Star (Dhruv Tara) with the help of Ursa Major by drawing an imaginary line through the two pointers of Ursa Major. This star is visible towards the north and is the only star that remains stationary in the sky with respect to the earth.

3. Explain why the Pole Star appears to be stationary in the sky and all other stars appear to revolve around it from east to west.

Ans: All the other stars appear to revolve from east to west whereas pole star appears to be stationary as it lies above the North pole on the axis of rotation of the earth.

4. Show the position of main stars in these constellations: a. Ursa Major b. Orion

Ans:



5. Why is Venus the hottest planet even though Mercury is closest to the Sun?

Ans: Venus is a very hot planet (about 480 °C), even hotter than Mercury, though it is further away from the sun. This is because of the high percentage of carbon dioxide in its atmosphere, which causes heating due to the greenhouse effect.

6. How is an artificial satellite different from a natural satellite? Give one example of each.

Ans: A celestial object that revolves around a planet is known as a natural satellite or moon of the planet. Example: The moon is the natural satellite of the earth. Whereas artificial satellites are man-made machines which are sent from the earth to get help in communication, weather forecasting, etc. Examples: Aryabhata, Bhaskara, Rohini, INSAT-1B, APPLE, etc.

7. Describe the physical features of the Moon.

Ans: The Moon is dry and barren with no atmosphere. Its surface is covered with several craters and mountains.

LONG-ANSWER QUESTIONS: Answer in about 60 words.

1. Give four ways in which stars are different from planets.

Ans: Stars are different from planets in the following ways:

Stars	Planets
(i) Emit their own light.	(i) Do not emit their own light.
(ii) Made up of hot gases.	(ii) Made up of rocks.
(iii) When seen from the earth they twinkle.	(iii) Do not twinkle
(iv) Massive in size	(iv) Smaller than stars.

2. What major factors have enabled life to evolve and survive on the Earth?

Ans: All the factors necessary for life are present only on Earth. It has an atmosphere containing the gases, oxygen and carbon dioxide, which are necessary for life.

(ii) It has water in liquid form, which is essential for life.

(iii) Being at the right distance from the sun, it is not as hot as Mercury or Venus, nor is it as cold as the planets which are further away.

3. Give five ways in which artificial satellites are useful to us.

Ans: Artificial satellites are very useful to us.

(i) They help in television and radio transmission.

(ii) They help in telephone communication.

(iii) They help us to study and forecast the weather by sending cloud pictures to the earth, taken from space.

(iv) They help in locating minerals.

(v) They help in studying agricultural yield on the earth by photographing from above.

4. What do you mean by 'phases of the Moon'? Draw a labelled diagram to show the phases of the Moon.

Ans: The moon's revolution and rotation are such that only one side of the moon always faces us. Also, we can see that portion of this side which reflects sunlight to us. This changes every day as the relative positions of the sun, earth and moon change every day. These are explained here. New moon: When we do not see the moon at all Crescent moon: We see only a part of the moon First quarter: When we see half of the moon Gibbous moon: When we see more than half of the moon Full moon: When we see the full moon. Then the cycle reverses. These shapes of the bright part of the moon, as seen from the earth, are known as phases of the moon.

HOTS QUESTIONS: Think and answer.

1. Why can't we see stars during the day?

Ans: Due to the brightness of the sun during the day we cannot see stars at that time.

2. Suppose a star which is 100 light years away explodes today. It is highly unlikely that you will be able to see the explosion. Why?

Ans: It is highly unlikely that a person alive today lives to see the exploding star as light from the star will take 100 years to reach the earth.

3. On the Earth, the Sun rises in the east and sets in the west. Will it be the same on Venus?

Ans: Unlike the earth and most other planets, Venus rotates on its axis from east to west, i.e. in the opposite direction. Hence on Venus the sun will rise in the west and set in the east.

4. Since your birth, how many times have you gone around the Sun?

Ans: As many times as my age in years.

5. Answer the following, giving reasons. a. Can you light a fire on the Moon?

b. If a meteor falls on the Moon, can you hear it fall?

c. Can you see the meteor falling on the Moon? Can life exist on the Moon?

Ans: (a) We cannot light a fire on the moon as there is no atmosphere on the moon.

(b) If a meteor falls on the moon, we cannot hear it fall as there is no air. Sound needs a medium to travel. (c) Yes, we can see the meteor falling on the moon.

(d) Life cannot exist on the moon because there is no air, i.e. no oxygen.

6. If the planet Saturn is inserted in water, will it float or sink? Why?

Ans: The planet Saturn will float because its density is less than that of water.