Chapter 13. Stars and the Solar System

Very Short Q&A:

Q1: Which of the following is not a planet

a. **Sun**
b. **Venus**
c. **Mars**
d. **Jupiter**

Ans: Sun

Q2: Which of the following is a star

a. **Sun**
b. **Moon**
c. **Earth**
d. **Venus**

Ans: Sun

Q3: The planet which is nearest to the sun is_____.

Ans: Mercury

Q4: The planet which is farthest from the sun is_____.

Ans: Neptune

Q5: Define constellation.

Ans: Constellations are named patterns of stars, group of stars having a recognisable shape is called constellation

Q6: Define satellite.

Ans: Any celestial body revolving around another celestial body is called its satellite

Q7: Give some examples of constellation

Ans: Ursa Major, Orion, Leo Major etc.

Q8: Name all of the planets of solar system.

Ans: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Q9: Asteroids are found between orbits of _____ and _____.

Ans: Mars and Jupiter.

Q10: Pole star is the member of solar system. True /False

Ans: False

Q11: Name the smallest planet of the solar system

Ans: Mercury

Q12: Name the brightest planet of solar system.

Ans: Jupiter

Q13: Name the farthest planet in the solar system.

Ans: Neptune

Q14: What are celestial objects?

Ans: The stars, the moon, planet and many other objects in the sky are called celestial objects.

Q15: What do you mean by phases of the moon?

Ans: The various phase of the bright part of moon as seen during a month are called phases of the moon.

Q16: Name the natural satellite of earth.

Ans: Moon

Q17: Moon's surface is dusty and _____.

Ans: Barren

Q18: Moon has no atmosphere and water. True/ False.

Ans: True

Q19: Name the nearest star from the earth.

Ans: Venus

Q20: Name the star which is nearest to the earth after sun.

Ans: Alpha Centauri

Q21: What is the direction of rotation of earth on its axis?

Ans: West to east

Q22: Name the star which does not appear to move in the sky.

Ans: Pole star

Q23: Name the constellation that appears in sky during summer time in the early part of the night.

Ans: Ursa Major

Q24: Name the constellation that appears in sky during winter time in the late evenings.

Ans: Orion

Q25: Name the members of solar system.

Ans: Sun, planets, asteroids, meteors and meteorites.

Q26: Define planets.

Ans: Planets are heavenly bodies orbiting the sun, they looks like star but they dont have their own light.

Q27: Define period of revolution of planets.

Ans: The time taken by a planet to complete one revolution is called its period of revolution.

Q28: Define artificial satellite.

Ans: Any celestial body revolving around another celestial body is called its satellite; man-made satellites are called artificial satellites.

Q29: Name the earth's nearest planetary neighbour.

Ans: Venus

Q30: Name the planet which is called as morning or evening star.

Ans: Venus

Q31: Name the planet on which life is known to exist.

Ans: Earth

Q32: Mars has _____ small and natural satellites.

Ans: two

Q33: Name the planet having faint ring around it.

Ans: Jupiter

Q34: Name the least dense planet of the solar system.

Ans: Saturn

Q35: Name the outermost planet of the solar system.

Ans: Jupiter, Saturn, Uranus and Neptune

Q36: The body that reaches the earth is called _____.

Ans: Meteorites

Q37: Name the first Indian artificial satellite.

Ans: Aryabhatta

Q38: Name some artificial satellites.

Ans: INSAT, IRS, EDUSAT, Kalpana- 1, etc.

Q39: In which part of the sky can we see Venus, if it is visible as an evening star?

Ans: In western horizon after sunset.

Q40: Name two objects other than sun, earth and planets that are the members of solar system.

Ans: Asteroids, meteors and meteorites.

Short Q&A:

Q1: What do you mean by celestial objects, explain with examples?

Ans: The stars the planets and many other objects in the sky are called celestial objects. For example: moon, nine planets, asteroids etc.

Q2: Why phases of the moon occur?

Ans: Just like Earth, half of the moon is lit by the sun, and half is in shadow at any given time. As the moon travels around the Earth, we see the moon from different angles, and thus can see different percentages of light and shadow. When the moon is full, the moon is on the opposite side of the Earth from the sun. As a result, we can see the whole of the lit side of the moon. At new moon, exactly the opposite alignment exists, with the moon being between the Earth and the sun. At that point, we can only observe the shadowed side of the moon. At first and third quarter moons, the moon is at a 90 degree angle from the Earth and sun.

Q3: Why can't we hear any kind of sound on moon?

Ans: Moon has no atmosphere and as we know sound cannot travel when there is no medium thus we cannot hear any kind of sound on the moon.

Q4: Define the following:

a. **Moon**
b. **Stars**

Ans:

a. Moon: Moon is a celestial object that does not have its own sunlight; it is visible to us due to reflected sunlight. There is no atmosphere and water on the moon, its surface is dusty and barren. Moon revolves around the earth so it is also called the natural satellite of earth.
b. Stars: Stars are other celestial object that can be seen in the night sky. Sun is the nearest star from the Earth; the stars are millions of times farther than the sun, STARS are present in the sky during the day time also but because of the bright sunlight they are not visible to us. They appear to move from east to west in the sky.

Q5: Differentiate between planet and stars.

Ans:

Planet	Star
1. Have no light of their own. 2. Do not twinkle. 3. Most planets on the other hand are near enough to the earth to be magnified by the telescope. 4. Planets have low temperatures 5. There are only nine planets in the solar system.	1. Have their own light. 2. Twinkles at night. 3. Since the stars are very far away, the telescope can only make them look brighter but not larger 4. A star has very high temperature. 5. There are billions of stars in the celestial sphere

Q6: Differentiate between moon and stars.

Ans: A moon is simply a natural satellite that moves around a planet, tied gravitationally to its parent planet. But a star is a large mass of gas that generates energy due to the thermonuclear fusion reactions happening at their cores. They range in size from a few kilometres in diameter to several times larger than the solar system. They form large collections that make up star clusters and galaxies.

Q7: Name the person who landed on the moon for the first time along with the date at which he landed there for the first time.

Ans: On July 21, 1969 the American astronaut, Neil Armstrong landed on the moon for the first time.

Q8: Write some characteristics of stars.

Ans:

- Have their own light.

- Twinkles at night.
- Since the stars are very far away, the telescope can only make them look brighter but not larger
- A star has very high temperature.
- There are billions of stars in the celestial sphere

Q9: Why we are not able to see the stars during the day time?

Ans: We are not able to see the stars during the day time because of the bright sunlight.

Q10: Why stars appear to move from east to west?

Ans: Earth rotates on its axis from west to east, thus stars appear to move from east to west.

Q11: Define constellation along with some examples.

Ans: Group of stars having a recognisable shape is called constellation. Constellation is an internationally defined area of celestial sphere. For example: Ursa Major, Orion etc.

Q12: Wright short notes on

a. **Ursa Major**
b. **Orion**

Ans:

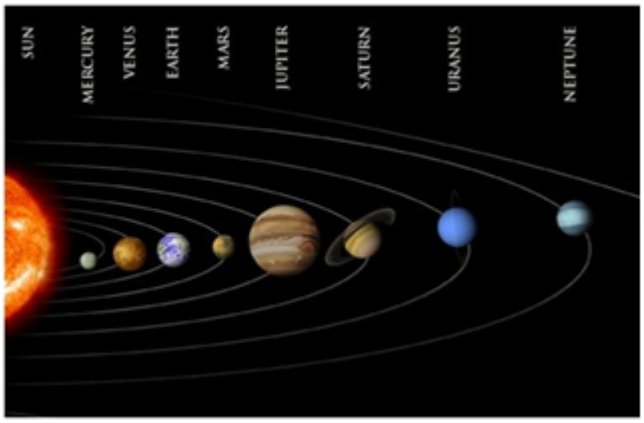
a. Ursa Major: Ursa Major can be seen in the sky during summer time in the early part of the night, it is also known as Big Dipper or Saptarashi. There are seven prominent stars in this constellation; it appears like a big question mark or ladle.
b. Orion: Orion can be seen in the sky during winter in the late evenings. It has seven or eight stars. The brightest star Sirius is located close to the Orion.

Q13: What is Cassiopeia?

Ans: Cassiopeia: Cassiopeia is a constellation that can be seen in the northern sky. It is visible during winter in the early part of night. It looks like distorted letter W or M.

Q14: Draw the diagram of solar system showing position of sun and all planets.

Ans:

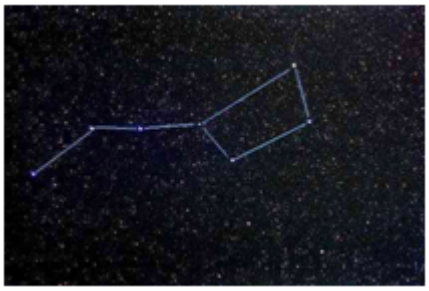


Q15: Draw sketches to show relative position of prominent stars in Orion.

Ans:

Q16: Draw sketches to show relative position of prominent stars in Ursa Major.

Ans:



Q17: Explain why planets do not collide while revolving around the Sun?

Ans: Planets move in their own orbit, thus they do not collide while revolving around sun.

Q18: What do you mean by satellite? Name some satellites.

Ans: Any celestial body revolving around another celestial body is called its satellite. Aryabhatta, INSAT, IRS, EDUSAT, Kalpana- 1, etc. are some satellites.

Q19: Differentiate between artificial and natural satellites?

Ans: Natural satellites are celestial body that orbits a planet or any other celestial body, they are found by nature. The most well-known natural satellite is the earth moon. The natural satellites are made up of natural materials like rocks, minerals, water, dust etc. The natural satellite cannot communicate on earth or with other planets. But artificial satellite is the device placed in orbit around the Earth, moon or other planet. They are man made. The first artificial satellite was sputnik I. It can communicate with instruments on earth.

Q20: What are the uses of artificial satellites?

Ans: The artificial planet can communicate with instruments on earth. Artificial satellites have many uses, including relaying communication signals, making accurate surveys and inventories of the earth's surface and weather patterns, and carrying out scientific experiments.

Q21: Write short notes on following:

a. **Mercury**
b. **Venus**

Ans:

a. Mercury: It is the nearest planet to the sun. It is the smallest planet of our solar system. It is very close to the sun so it is quite difficult to observe it. It has no satellite of its own.
b. Venus: It is the Earth's nearest planetary neighbour. It is the brightest planet in the night sky. Sometimes it appears in the eastern sky before the sunrise, and sometimes in western sky just after the sunset. Thus it is also called morning or evening star. It has no satellite of its own.

Q22: Write short notes on the following:

a. **Jupiter**
b. **Saturn**

Ans:

a. Jupiter: It is the largest planet of the solar system. It rotates very rapidly on its axis. It has a large number of satellites. It also has a faint ring around it.
b. Saturn: Saturn lies beyond Jupiter; it contains beautiful rings around it which is not visible with the naked eye. It has a large number of satellites. It is least dense among all planets.

Q23: Write short notes on the outermost planet of the solar system.

Ans: Outermost planet of solar system includes planets like Jupiter, Saturn, Uranus and Neptune.

Jupiter: It is the largest planet of the solar system. It rotates very rapidly on its axis. It has a large number of satellites. It also has a faint ring around it.

Saturn: Saturn lies beyond Jupiter; it contains beautiful rings around it which is not visible with the naked eye. It has a large number of satellites. It is least dense among all planets.

Uranus: It can be seen via telescope only. In its orbital motion it appears to roll on its side. It rotates from west to east.

Neptune: It can be seen via telescope only. Neptune has a planetary ring system, though one much less substantial than that of Saturn.

Q24: Define asteroids.

Ans: Asteroids are a class of small Solar System bodies in orbit around the Sun. They have also been called planetoids, especially the larger ones.

Q25: Define meteors and meteorites.

Ans: Small pieces of space debris (usually parts of comets or asteroids) that are on a collision course with the Earth are called meteoroids. When meteoroids enter the Earth's atmosphere

they are called meteors. Most meteors burn up in the atmosphere, but if they survive the frictional heating strike the surface of the Earth and they are called meteorites.

Q26: Explain how you can locate pole star with the help of Ursa Major.

Ans: Yes. Pole Star is located by Ursa Major. On a clear moonless sky during summer at 9.00 p.m. at the northern part of sky we can see Ursa Major. Imagine a straight line that passes through these stars and extend this line towards the northern side to a star that is not too bright. This is a Pole Star. This star does not move at all. Ursa Major moves east to west of this Pole Star.

Q27: Why is the distance between stars expressed in light years?

Ans: Stars are very far from the earth, their distance if written in km will not be convenient to read and memorise, and thus large distances are expressed in light year. It is the distance travelled by light in one year.

Q28: What do you understand by the statement that the star is six light year away from the earth?

Ans:

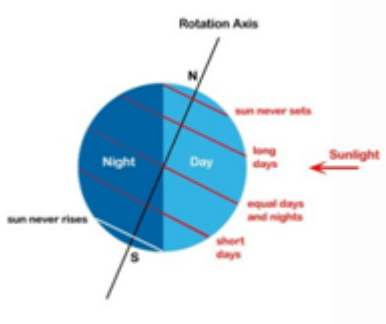
If a star is six light year away from the earth, it means time taken by light to travel in six years, this mean that the distance between star and earth is 6 (9.46 10)^{12} = (7.6 10)^{13} km.

Q29: What are the superstitious about the comets?

Ans: Superstitious about comets is that comets are messengers of disasters, such as wars, epidemics and floods, but it is actually a myth as appearance of comets is a natural phenomenon.

Q30: Draw a sketch of earth showing its rotation on axis.

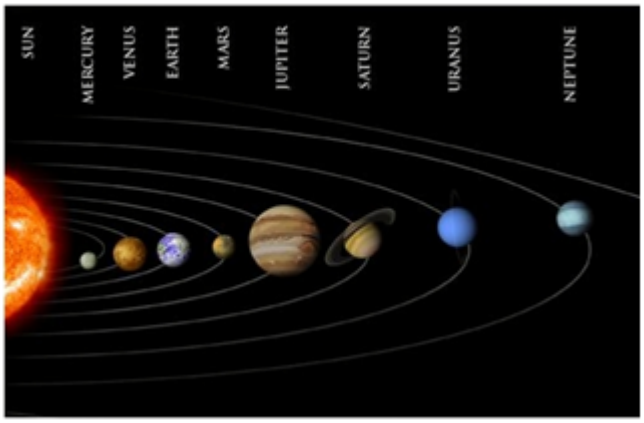
Ans:



Long Q&A:

Q1: Explain solar system along with the sketch of the same.

Ans:



- Mercury: It is the nearest planet to the sun. It is the smallest planet of our solar system. It is very close to the sun so it is quite difficult to observe it. It has no satellite of its own.
- Venus: It is the Earth's nearest planetary neighbour. It is the brightest planet in the night sky. Sometimes it appears in the eastern sky before the sunrise, and sometimes in western sky just after the sunset. Thus it is also called morning or evening star. It has no satellite of its own.
- Jupiter: It is the largest planet of the solar system. It rotates very rapidly on its axis. It has a large number of satellites. It also has a faint ring around it.
- Saturn: Saturn lies beyond Jupiter; it contains beautiful rings around it which is not visible with the naked eye. It has a large number of satellites. It is least dense among all planets.

Outermost planet of solar system includes planets like Jupiter, Saturn, Uranus and Neptune.

- Uranus: It can be seen via telescope only. In its orbital motion it appears to roll on its side. It rotates from west to east.
- Neptune: It can be seen via telescope only. Neptune has a planetary ring system, though one much less substantial than that of Saturn.

Q2: The radius of Jupiter is 11 times the radius of Earth; calculate the ratio of volumes of Jupiter and the Earth.

Ans:

1. Given that radius of Jupiter is 11 times the radius of Earth
   Volume of the sphere = $4/3\ \pi r^2$ where r is radius.
   Let RE= radius of Earth
   And RJ= radius of Jupiter
   Given RJ= 11 × RE

Volume of Jupiter= $4/3\ \pi r^2 J = 4/3\ \pi\ (11\ RE)(11\ RE) = 1331$

Q3: Explain constellations in the night sky.

Ans: Group of stars having a recognisable shape is called constellation. Constellation is an internationally defined area of celestial sphere. For example: Ursa Major, Orion etc.

Ursa Major can be seen in the sky during summer time in the early part of the night, it is also known as Big Dipper or Saptarashi. There are seven prominent stars in this constellation; it

appears like a big question mark or ladle.

Orion can be seen in the sky during winter in the late evenings. It has seven or eight stars. The brightest star Sirius is located close to the Orion.

Cassiopeia is a constellation that can be seen in the northern sky. It is visible during winter in the early part of night. It looks like distorted letter W or M.