

**Q.1) With reference to the water on the planet Earth, consider the following statements:
(UPSC – 2021)**

1. The amount of water in the rivers and lakes is more than the amount of groundwater.
2. The amount of water in polar ice caps and glaciers is more than the amount of groundwater.

Select the correct answer using the codes given below.

- a) 1 only
- b) 2 only
- c) Both 1 & 2
- d) Neither 1 nor 2

**Q.2) In northern hemisphere, longest day of year normally occurs in the:
(UPSC – 2022)**

- a) First half of the month of June.
- b) Second half of the month of June.
- c) First half of the month of July.
- d) Second half of month of July

Q.3) A person stood alone in a desert on a dark night and wanted to reach his village which was situated 5 km east of the point where he was standing. He had no instruments to find the direction but he located the polestar. The most convenient way now to reach his village is to walk in the. (UPSC – 2021)

- a) Direction facing the polestar
- b) Direction opposite to the polestar
- c) Direction keeping the polestar to his left
- d) Direction keeping the polestar to his right

Q.4) Electrically charged particles from space traveling at speeds of several hundred km/sec can severely harm living beings if they reach the surface of the Earth. What prevents them from reaching the surface of the Earth? (UPSC - 2012)

- a) The Earth's magnetic field diverts them towards its poles.
- b) The Ozone layer around the Earth reflects them back to outer space.
- c) Moisture in the upper layers of the atmosphere prevents them from reaching the surface of the Earth.

d) None of the statements (a), (b), and (c) given above is correct.

Q. 5) Variations in the length of daytime and night time from season to season are due to: (UPSC – 2012)

- a) The earth's rotation on its axis
- b) The earth's revolution around the sun in an elliptical manner
- c) Latitudinal position of the place
- d) Revolution of the earth on a tilted axis

Q.6) On 21st June, the Sun: (UPSC – 2019)

- a) Does not set below the horizon at the Arctic Circle
- b) Does not set below the horizon at Antarctic Circle
- c) Shines vertically overhead at noon on the Equator
- d) Shines vertically overhead at the Tropic of Capricorn

Q.7) With reference to Black Hole, consider the following statements: (UPSC – 2021)

1. Black holes exhibit strong gravitational pull due to very high density.
2. No particle can escape from black hole except some electromagnetic radiation.
3. Event horizon marks the limits of a black hole.

Select the correct answer using the codes given below.

- a) 1 only
- b) 1 and 3 only
- c) 3 only
- d) 1, 2 and 3

Q.8) Consider the following statements (NCERT class 11, fundamental of physical geography, chapter - 9)

Assertion: Even with the longest length of the day in the arctic during summer solstice and in the Antarctic during winter solstice the insolation received becomes minimum.

Reason: The sun's rays become more or less parallel to the ground surface, and the ice cover reflects most of the solar radiation.

Choose the correct code

- a) A is true, but R is false.
- b) A is false, but R is true
- c) Both A and R are true and R is the correct explanation of A.
- d) Both A and R are true and R is not the correct explanation of A.

Q.9). Consider the following statements about solar system: (NCERT class 6 chapter 1)

- 1. The sun, the moon and all those objects shining in the night sky are called celestial bodies.
- 2. All planets have their own natural satellites.
- 3. Earth is the third largest planet of the solar system.

Select the correct answer using the codes below:

- a) 1 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) All of the above

Q.10). Which of the following statements is/are correct? (Certificate Physical and human geography. by G.C Leong; chapter - 1)

- 1. The rotation of the Earth around the sun causes the variation in the length of day and night at different times of the year.
- 2. The sun appears to be vertically overhead at the tropic of cancer on 21st June.
- 3. The sun is never overhead in the regions beyond the tropics at any time of the year.

Select the correct answer using the code given below:

- a) 2 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) 1, 2 and 3

Q.11). What are the factors responsible for the varying length of day and night? (certificate human and physical geography by G.C. Leong; chapter- 1)

1. Inclination of the Earth at an angle of $66\frac{1}{2}$ to the plane of the ecliptic.
2. Tidal force, due to the moon's gravitational attraction.
3. Both rotation and revolution of earth.
4. Coriolis effect

Select the correct answer using the code given below.

- a) 1 and 2 only
- b) 3 and 4 only
- c) 1 and 3 only
- d) 1, 2, 3 and 4

Q.12). Venus is called Earth's twin. Why? (NCERT class 6 geography; Chapter - 1).

1. It takes the same time as that of the Earth to revolve around the Sun.
2. It has a similar size as that of the Earth.
3. It has one natural satellite as that of the Earth
4. It has a similar shape as that of the Earth.

Choose the correct answer using the codes below:

- a) 2,3 and 4 only
- b) 1 and 3 only
- c) 2 and 4 only
- d) All of the above

Q.13). Consider the following statements with respect to Earth: (NCERT class 6 geography; Chapter – 2 & 3).

1. Rotation of earth and its tilted axis is responsible for changes in season.
2. Only half of the earth receives light from the sun at a time due to tilt of the Earth's axis.

Which of the above given statement/s is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2

- d) Neither 1 nor 2

Q.14). Consider the following planets: (NCERT class 6 geography; Chapter-1).

1. Mars
2. Jupiter
3. Saturn
4. Uranus

How many of the planets mentioned above have rings around them?

- a) Only one
- b) Only two
- c) Only three
- d) All four

Q. 15). Consider the following statements: (NCERT class 6; chapter-1)

Statement-I: Only one side of the moon is visible to us on the earth.

Statement-II: The time taken by the moon to complete one revolution and one spin around its own axis is the same.

Which one of the following is correct in respect of the above statements?

- a) Both Statement-I and Statement- II are correct and Statement-II is the correct explanation of Statement-I.
- b) Both Statement-I and Statement- II are correct and Statement-II is not the correct explanation of Statement-I.
- c) Statement-I is correct but Statement-II is incorrect
- d) Statement-I is incorrect but Statement-II is correct.

Q.16). Consider the following statements: (NCERT class 6; Chapter-2).

1. The distance between the longitudes decreases steadily poleward until it becomes zero at the poles.
2. Unlike parallels of latitude, all meridians are of varying length.
3. The 0° longitude passing through Greenwich is known as the Prime Meridian.

How many of the above statements are correct?

- a) Only one
- b) Only two
- c) All three
- d) None

Q.17). In the southern hemisphere, the longest day of the year normally occurs in the (NCERT class 6 geography; Chapter-3)

- a) First half of the month of June
- b) Second half of the month of June
- c) First half of the month of December
- d) Second half of the month of December

Q.18). Which of the following phenomena is observed on the equinox? (NCERT class 6 Geography; Chapter – 3 / page number - 20).

- 1. Direct sun rays fall on the equator
- 2. Poles are tilted towards the sun
- 3. Equal days and equal nights

Select the correct answer using the code given below:

- a) 1 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 3 only

Q.19). Consider the following statements: (NCERT class 11 fundamentals of physical geography Class 11; page – 17)

- 1. Early atmosphere was composed of Hydrogen and Helium and these were destroyed due to the impact of solar winds.
- 2. The process of Degassing is responsible for the formation of present atmosphere

Which of the statements given above is/are correct?

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.20). Consider the following pairs: (NCERT class 11, fundamentals of physical Geography Chapter 14)

Term	Relative Distance from Earth
1. Aphelion	Earth is farthest from the sun
2. Perihelion	Moon is closest to the earth
3. Perigee	Earth is the nearest to the sun
4. Apogee	Moon is farthest from earth

How many pairs given above is /are correctly matched?

- a) Only one pair
- b) Only two pairs
- c) Only three pairs
- d) All four pairs

Q.21). Consider the following statements: (certificate of physical and human geography by G.C. Leong; Chapter –1)

1. Earth rotates on its own axis from east to west, causing the seasons and the year.
2. When the earth revolves around the sun, it spins on a circular orbit.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.22). Consider the following statements about planets: (NCERT class 6 geography; chapter -1)

1. Outer planets are very far from the sun and made up of rocks.
2. Inner planets are very close to the sun and made up of gases and liquids.

Which of the above given statement/s is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.23). With reference to the Earth, the term 'earth day' refers to? (NCERT class 6; Chapter - 3, page number 18)

- a) Period of revolution
- b) Period of rotation
- c) Equinox day
- d) Solstice day

Q.24). Consider the following statements about Asteroids: (NCERT class 6 geography; Chapter - 6 & 17)

1. Asteroids are found between the orbits of Earth and Mars.
2. Ceres is the largest discovered asteroid in the solar system.
3. Asteroids also move around the Sun.

Which of the above given statement/s is/are incorrect?

- a) 2 and 3 only
- b) 2 only
- c) 1 and 2 only
- d) 1 only

Q.25). Consider the following statements: (NCERT class 11 fundamentals of physical geography Chapter 11).

1. A solar eclipse occurs when the moon gets in the way of the sunlight and casts its shadow on the Earth.
2. A lunar eclipse occurs when the Earth gets in the way of the sun's light hitting the moon.

Which of the above given statement/s is/are incorrect?

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

IASBABA'S

Q.1) Solution (b)**Explanation:****Fresh Water in the World**

- Of the total freshwater, 69% resides in glaciers, 30% underground, and less than 1% is located in lakes, rivers, and swamps. Thus, the amount of water in rivers and lakes is less than the amount of groundwater. **Hence statement 1 is wrong.**
- Of the total freshwater, 69% resides in glaciers and 30% underground. Polar ice caps and glaciers have more water than the amount of groundwater. **Hence statement 2 is correct**

Q.2) Solution (b)**Explanation:****Sub-Theme: Motion of Earth****Summer Solstice (21st June):**

- The Northern Hemisphere is tilted towards the sun and the rays of the sun fall directly on the Tropic of Cancer → areas receive more heat.
- The longest day and the shortest night at these places occur on 21st June. Thus, the second half of the month of June in the northern hemisphere has the longest day of the year.
- Areas near the poles receive less heat as the rays of the sun are slanting.
- The North Pole is inclined towards the sun and the places beyond the Arctic Circle experience continuous daylight for about six months.
- Since a large portion of the Northern Hemisphere is getting light from the sun, it is summer in the regions north of the equator.
- Southern Hemisphere: All these conditions are reversed (winter season- longer nights)

NOTE: This question is a repetition from 2019 only the sentences of both the question and options are twisted to confuse the candidate. Also, UPSC has asked questions from similar themes in 2013, please refer to the PYQs for detailed explanation.

Q.3) Solution (c)**Explanation:****Sub-Theme: Basics of Solar System**

- **Option (a) is incorrect:** The North star/Pole Star indicates the north direction, therefore walking in the direction of the pole star will lead him towards NORTH of his current position.
- **Option (b) is incorrect:** Walking in the opposite direction will lead him towards SOUTH of his current position.
- **Option (c) is correct:** Walking in the direction while keeping the polestar to his left would lead him towards EAST of his current position and he can reach his village.
- **Option (d) is incorrect:** Walking in the direction while keeping the pole star to his right would lead him towards WEST of his current position Note: The Pole star is not visible from the southern hemisphere. Some of the northern constellations like Ursa Major may also not be visible from some points in the southern hemisphere.

Q.4) Solution (a)

Explanation:

Sub-Theme: Basics of Solar System

Earth's Magnetic Field Diverts Electrically Charged Particles:

- **Option (a) is correct:** Earth's field lines start near the South Pole of the Earth, curve around in space, and converge again near the North Pole, it forms the magnetosphere, which deflects the Sun's ions and electrons before they reach us. Most of the solar wind is diverted to poles.
- **Option (b) is incorrect:** The ozone layer absorbs a range of ultraviolet energy; it has nothing to do with Electrically charged particles.
- **Option (c) is incorrect:** Moisture in the upper layers of the atmosphere i.e. The Stratosphere prevents Ultraviolet rays from reaching the surface of the earth

Q.5) Solution (d)

Explanation:

Sub-Theme: Motion of the Earth

- **Option (d) is correct:** Variations in the length of daytime and night time from season to season due to revolution of the earth on a tilted axis. Movement of the earth around the sun in a fixed path or orbit. It takes 365¼ days (one year) to revolve around the sun. As a result of the earth's revolution, you can observe that there are days and nights as well as seasonal fluctuations.

Q.6) Solution (a)**Explanation:****Sub-Theme: Motion of Earth**

Option (a) is correct: Areas near the poles receive less heat as the rays of the sun are slanting.

- The North Pole is inclined towards the sun and the places beyond the Arctic Circle experience continuous daylight for about six months.
- Summer Solstice (21st June): The Northern Hemisphere is tilted towards the sun and the rays of the sun fall directly on the Tropic of Cancer hence the areas receive more heat.
- Since a large portion of the Northern Hemisphere is getting light from the sun, it is summer in the regions north of the equator. The longest day and the shortest night at these places occur on 21st June.
- Southern Hemisphere: All these conditions are reversed (winter season- longer nights)

Q.7) Solution (b)**Explanation:**

- **Statement 1 is Correct:** A black hole exhibits a strong gravitational pull, due to very high density, that no particle or electromagnetic radiation can escape from it.
- **Statement 2 is Incorrect:** Nothing can escape from black hole
- **Statement 3 is Correct:** Event horizon, boundary marking the limits of a black hole. At the event horizon, the escape velocity is equal to the speed of light. Since general relativity states that nothing can travel faster than the speed of light, nothing inside the event horizon can ever cross the boundary and escape beyond it, including light.

Q. 8) Solution (c)**Explanation:****Statement 1 is Correct: Factors Affecting the DISTRIBUTION OF INSOLATION**

- angle of the sun's rays or the altitude of the sun,
- length of days,
- distance between the sun and the earth,
- sunspots, and
- Effects of the atmosphere.

Length of days: In spite of increasing length of day from the equator towards the north pole during summer solstice and from the equator to the south pole during winter solstice the amount of insolation received at the ground surface decreases considerably poleward.

Statement 2 is Correct: In spite of increasing length of day from the equator towards the north pole during summer solstice and from the equator to the south pole during winter solstice the amount of insolation received at the ground surface decreases **considerably** poleward because of **decrease in the angle of sun's rays**, in spite of the longest length of day at the pole's insolation becomes minimum because:

- **The sun's rays become more or less parallel to the ground surface, and**
- **The ice cover reflects most of the sun's rays.**

It is apparent that the angle of the sun's rays controls the amount of insolation received more effectively than the length of day. It may be thus concluded that the places having longer length of day and vertical sun rays will certainly receive maximum insolation.

Q. 9) Solution (c)

Explanation:

- Statement 1 is correct: The sun, the moon and all those objects shining in the night sky are called celestial bodies. Some celestial bodies are very big and hot. They are made up of gasses. They have their own heat and light, which they emit in large amounts. These celestial bodies are called stars. The sun is a star.
- Over the last 50 years, the term satellite has come to be used to describe the man-made satellites launched into orbit for communication and broadcasting purposes, but the term actually refers to any object found to orbit around a planet. Referred to as natural satellites or moons, more than 150 such bodies orbit around planets in the solar system.
- Statement 2 is incorrect: Mercury and Venus do not have their own natural satellites. Earth has only one large natural satellite, known as the Moon.
- Statement 3 is incorrect: Earth is the fifth largest planet of the Solar system and third nearest planet to the Sun.
- Planet size (largest to smallest):
 - Jupiter - (diameter = 142,800 km)

- Saturn - (diameter = 120,660 km)
- Uranus - (diameter = 51,118 km)
- Neptune - (diameter = 49,528 km)
- Earth - (diameter = 12,756 km)
- Venus - (diameter = 12,104 km)
- Mars - (diameter = 6787 km)
- Mercury - (diameter = 4879.4 km)

Q. 10) Solution (c)

Explanation:

- **Statement 1 is incorrect:** The revolution of the earth and its inclination to the plane of the ecliptic which cause the variation in the length of day and night at different times of the year.
- **Statement 2 is correct:** After the March equinox the sun appears to move north and is vertically overhead at the Tropic of Cancer on about 21 June. This is known as the June or summer solstice, when the northern hemisphere will have its longest day and shortest night. By about 22 December, the sun will be overhead at the Tropic of Capricorn. This is the winter solstice when the southern hemisphere will have its longest day and shortest night.
- **Statement 3 is correct:** The Tropics thus mark the limits of the overhead sun, far beyond these, the sun is never overhead at any time of the year. Such regions are marked by distinct seasonal changes spring, summer, autumn and winter.

Q. 11) Solution (c)

Explanation:

- **Statement 1 is correct:** The axis of the earth is inclined to the plane of the ecliptic (the plane in which the earth orbits around the sun) at an angle of $66\frac{1}{2}^{\circ}$, giving rise to different seasons and varying lengths of days and nights. The Arctic Circle is at $66\frac{1}{2}^{\circ}$ N.

- **Statement 2 is incorrect:** Tidal forces have no relation with the duration of day and night. It affects the movement of water due to its gravitational pull practically viewed at the coastal areas. In the open sea noticing tidal waves is very difficult.
- **Statement 3 is correct:** Both rotation (on axis) and revolution (rotation around Sun in elliptical orbit) contributes to the varying length of day and night. Revolution contributes to the intensity of the sunlight as it is related with the positional change of Distance among sun and earth like ape-hellion and perihelion.
- **Statement 4 is incorrect:** Our planet's rotation produces a force on all bodies moving relative to the Earth. Due to Earth's approximately spherical shape, this force is greatest at the poles and least at the Equator. The force, called the "Coriolis Effect," causes deflection in direction of winds and ocean currents. So, it 's rotation which produces the Coriolis force.

Q. 12). Solution (c)

Explanation:

- **Statements 2 and 4 are correct:** Venus is considered as 'Earth's-twin' because its size and shape are very much similar to that of the earth.
- Venus is sometimes called Earth's twin or Earth's sister because Venus and Earth are almost the same size, have about the same mass (they weigh about the same), and have a very similar composition (are made of the same material). They are also neighboring planets.
- However, Venus and Earth are also very different. Venus has an atmosphere that is about 100 times thicker than Earth's and has surface temperatures that are extremely hot. Venus does not have life or water oceans like Earth does. Venus also rotates backwards compared to Earth and the other planets.

Q. 13). Solution (d)**Explanation:**

- **Statement 1 is incorrect:** Revolution of earth and its tilted axis is responsible for seasons. Seasons change due to the change in the position of the earth around the sun.
- **Statement 2 is incorrect:** Due to the spherical shape of the earth, only half of it gets light from the sun at a time. The portion facing the sun experiences day while the other half away from the sun experiences night.

Q.14) Solution (C)**Explanation:**

- There are a total 8 planets in the solar system namely Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. **Out of these 8, 4 planets namely Jupiter, Saturn, Neptune and Uranus have rings around them.** These rings are belts of small debris. These rings can be seen from the earth with the help of powerful telescopes.

Q.15) Solution (a)**Explanation:**

- **Statement 1 is correct:** Our earth has only one satellite, that is, the moon. Its diameter is only one-quarter that of the earth. It appears so big because it is nearer to our planet than other celestial bodies.
- **Statement 2 is correct:** The moon moves around the earth in about 27 days (Revolution). It takes exactly the same time to complete one spin (Rotation). As a result, only one side of the moon is visible to us on the earth.
- Hence, both the statements I and II are correct and Statement I is the correct explanation for statement II.

Q.16) Solution (b)**Explanation:**

Longitudes are the lines of references running from North pole to South pole to find out how far east or west the places are.

- **Statement 1 is correct:** The distance between the longitudes decreases steadily towards the pole until it becomes zero at the poles.
- **Statement 2 is incorrect:** Unlike parallels of latitude, all meridians are of equal length.
- **Statement 3 is correct:** As all meridians are of equal length, it was difficult to number the meridians. Hence, all countries decided that the count should begin from the meridian which passed through Greenwich, where the British Royal Observatory is located. This meridian is called the Prime Meridian. Its value is 0° longitude and from it we count 180° eastward as well as 180° westward. The Prime Meridian and 180° meridian divide the earth into two equal halves, the Eastern Hemisphere and the Western Hemisphere

Q.17) Solution (d)**Explanation:**

- On 22nd December, the Tropic of Capricorn receives direct rays of the sun as the South Pole tilts towards it. As the sun's rays fall vertically at the Tropic of Capricorn, a larger portion of the Southern Hemisphere gets light.
- Therefore, it is summer in the Southern Hemisphere with longer days and shorter nights. This is called the Winter Solstice.

Q.18) Solution (c)**Explanation:**

- On the equinox, that is 21st March and September 23rd, direct rays of the sun fall on the equator. At this position, neither of the poles are tilted towards the sun. So, the whole earth experiences equal days and equal nights. Hence **statements 1 and 3 are correct.**

Q.19) Solution (c)**Explanation:**

- Statement 1 is Correct: The early atmosphere, with hydrogen and helium, is supposed to have been stripped off as a result of the solar winds. This happened not only in the case of the earth, but also in all the terrestrial planets, which were supposed to have lost their primordial atmosphere through the impact of solar winds.
- Statement 2 is Correct: During the cooling of the earth, gasses and water vapor were released from the interior solid earth. This started the evolution of the present atmosphere. The early atmosphere largely contained water vapor, nitrogen, carbon dioxide, methane, ammonia and very little of free oxygen. The process through which the gasses were outpoured from the interior is called degassing.

Q.20) Solution (b)**Explanation:****Term - Relative Distance from Earth**

1. Aphelion - Earth is farthest from the sun
2. Perihelion - earth is closest to the sun
3. Perigee - Moon is the nearest to the earth
4. Apogee - Moon is farthest from earth

Q.21) Solution (b)**Explanation:**

- **Option (b) is correct:** The Earth moves in space in two distinct ways: it rotates on its own axis from west to east once every 24 hours, causing day and night. It also revolves around the sun in an orbit once in every 365 days causing the seasons and the year.
- When the earth revolves around the sun, it spins on an elliptical orbit at a speed of 18.5 miles per second or 66,600 m.p.h. One complete revolution takes 365 days or a year. As it is not possible to show a quarter of a day in the calendar, a normal year is taken to be 365 days, and an extra day is added every four years as a Leap Year.
- In the summer (June) conditions are exactly reversed. Daylight increases as we go poleward. At the Arctic Circle, the sun never 'sets' at mid-summer (21 June) and there is a complete 24-hour period of continuous daylight.

- In summer the region north of the Arctic Circle is popularly referred to as 'Land of the Midnight Sun'. At the North Pole, there will be six months of continuous daylight.

Q.22) Solution (d)**Explanation:**

- **Statement 2 is incorrect:** Mercury, Venus, Earth, and Mars are the planets closest to the Sun. They are called the inner planets. The inner planets are made up mostly of rock.
- **Statement 1 is incorrect:** The outer planets are Jupiter, Saturn, Uranus, and Neptune which are made up of gasses and liquids.

Q.23) Solution (b)**Explanation:**

- The earth has two types of motions, namely rotation and revolution. Rotation is the movement of the earth on its axis. The movement of the earth around the sun in a fixed path or orbit is called Revolution. The earth takes about 24 hours to complete one rotation around its axis. The period of rotation is known as the earth day. This is the daily motion of the earth.

Q. 24) Solution (d)**Explanation:**

- Statement 3 is correct: Apart from the stars, planets and satellites, there are numerous tiny bodies which also move around the sun. These bodies are called asteroids.
- Statement 1 is incorrect: They are found between the orbits of Mars and Jupiter. Scientists are of the view that asteroids are parts of a planet which exploded many years back.
- Statement 2 is correct: Ceres – the largest discovered asteroid in the solar system. Most of the asteroids orbit the Sun between the orbit of Mars and Jupiter. This area is called the asteroid belt.

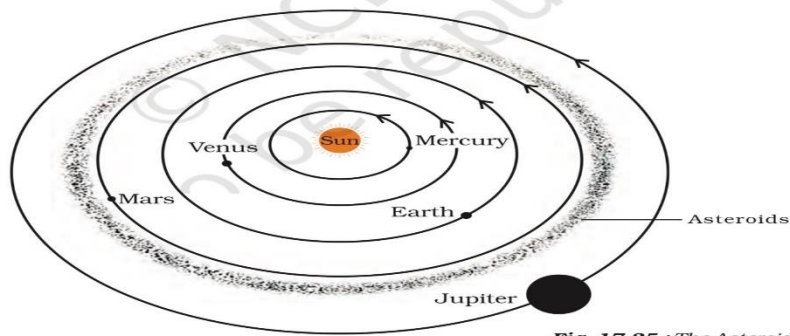
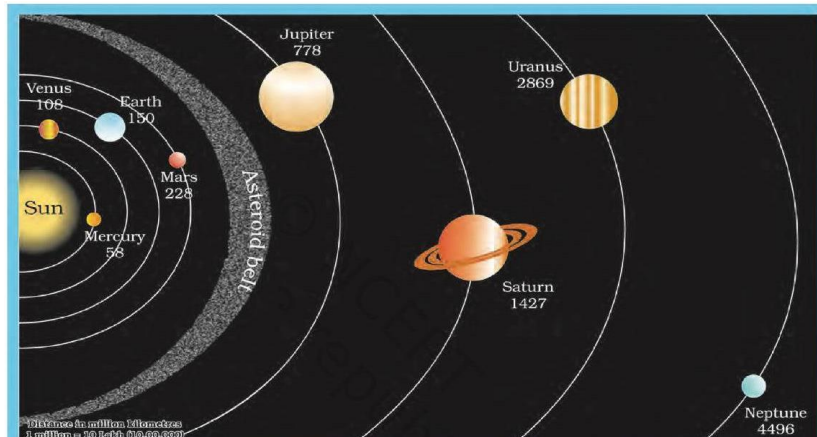


Fig. 17.25 : The Asteroid belt



Q. 25) Solution (d)

Explanation:

- **Statement 1 is correct:** A solar eclipse happens when the moon gets in the way of the sunlight and casts its shadow on the Earth.
- **Statement 2 is correct:** The Moon does not have its own light. It shines because its surface reflects the Sun's rays. During a lunar eclipse, Earth gets in the way of the sun's light hitting the moon. That means that during the night, a full moon fades away as Earth's shadow covers it up. The moon can also look reddish because Earth's atmosphere absorbs the other colors while it bends some sunlight toward the moon.