

## SOLAR SYSTEM

### (1) STARS AND THE SOLAR SYSTEM

The sun and the celestial bodies which revolve around it form the Solar System. This includes the eight planets and their satellites (such as our moon), dwarf planets and their satellites, as well as asteroids, comets and countless particles of small objects. The gravitational attraction between the Sun and these objects keeps them revolving around it.

#### (A) The Stars

All the objects in sky are called **celestial objects**. The celestial bodies which emit their own light are called stars.

Sur is also a star nearest to us. All other stars are millions of times farther away than the Sun. So, they appear as a point object. In day time stars are not visible due to the presence of bright sunlight.

Star's appear to move from East to West i.e. they rise in the East in the evening and set in the West in the early morning. The Pole Star does not appear to move as it is situated in the direction of the earth's axis. So, it is used to find direction at night.

#### Constellations

Group of stars having some recognisable shapes are called constellation. Some of the constellations are discussed below

#### Usra Major

- It is also known as the **Big Dipper**, the Great Bear or the **Saptarishi**. It can be seen in summer time in the early part of the night.
- There are seven prominent stars in this constellation appearing like a big ladle or a question mark.

#### Orion

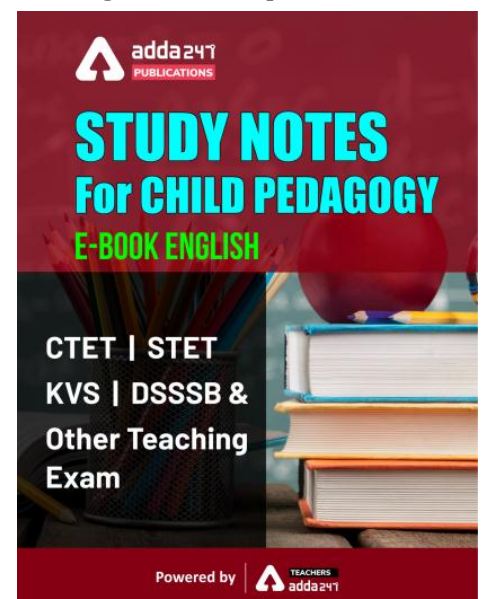
- It is also called **hunter** and can be seen during winter in the late evening. It has seven or eight stars.
- The brightest star Sirius is located close to Orion.

#### Cassiopeia

- It is visible in the northern sky during winter in the early part of the night. It looks like a distorted letter 'W' or 'M'.

### (2) The Solar System

- The Sun along with the celestial bodies revolving around it is called Solar System. It consists of planets, comets, asteroids, meteors and satellites etc.

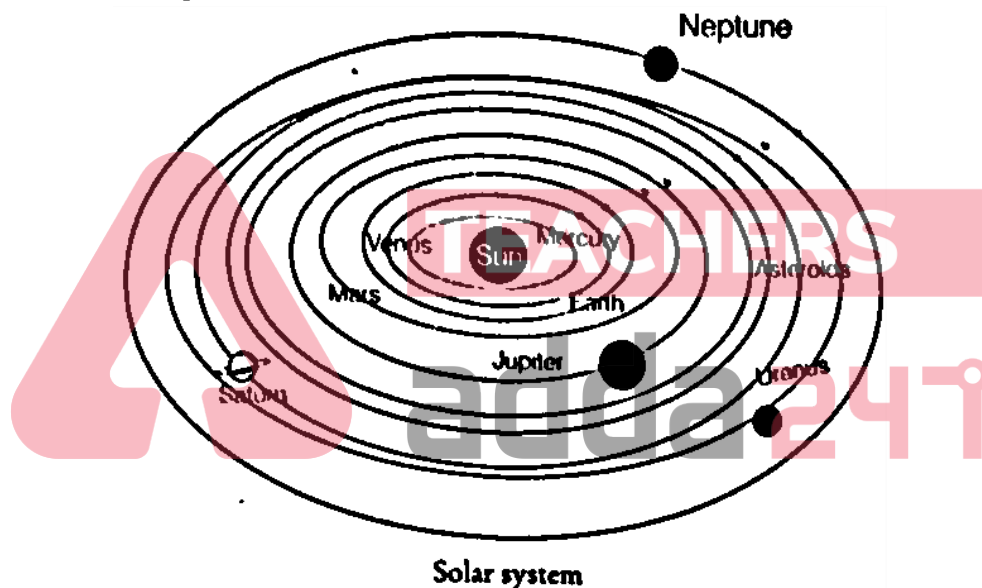


## The Sun :-

- The Sun is nearly 150000000 km away from the earth.
- Large distances in universe are measured in light years. It is the distance travelled by light in one year. Sun is the source of almost all energy on the earth.

## The Planets

- The planets do not emit their own light. A planet has a definite path in which it revolves around the Sun called orbit.
- Besides revolving around the Sun, a planet also rotates on its own axis.
- Solar system has eight planets revolving in different orbits.
- Some planets are known to have satellite like moon.
- A satellite is any celestial body revolving around another celestial body.
- Eight planets according to their distance from the Sun are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

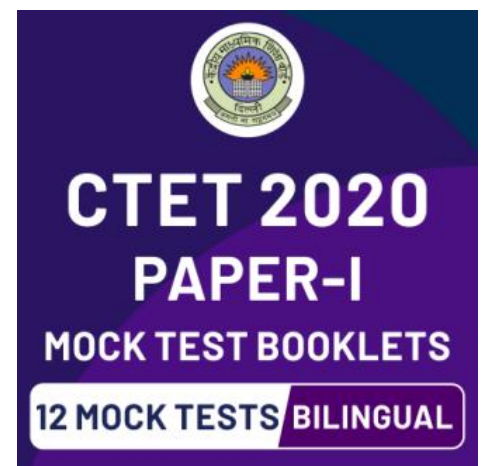


## Mercury (Budh) :-

- It is the nearest and smallest planet of solar system having no satellite.
- It is hidden in the glare of Sun, so not observable easily except during twilight.
- Mercury is the second densest planet due to being composed mainly of heavy metals and rock.

## Venus (Shukra) :-

- It is the earth's nearest planetary neighbour and **brightest planet** in the night sky.
- It is called the morning or an evening star although it is not a star .
- It rotates from East to West and having no satellites of its own.



## The Earth (Prithvi) :-

- It is the only planet in the solar system where life exists. This is because of availability of some special environmental conditions necessary for the existence of life such as, it is just at the right distance from the Sun and hence, having the right temperature range, presence of water, suitable atmosphere and blanket of ozone around it etc.
- Earth appears blue - green in colour from space due to reflection of light from **water and landmass** on its surface.
- Axis of rotation of earth is not perpendicular to the plane of its orbit but a little tilted. This **tilt** is responsible for the change of season on the earth.
- Earth has one natural satellite called moon and several artificial satellites revolving around it.
- The earth is the densest planet in the solar system.
- Earth is an oblate spheroid. This means it is spherical in shape, but not perfectly round. It has a slightly greater radius at the Equator, the imaginary line running horizontally around the middle of the planet.
- Near the surface, earth has an atmosphere that consists of 78 per cent nitrogen, 21 per cent oxygen, and 1 per cent other gases such as argon, carbon dioxide and neon.
- The atmosphere affects earth's long - term climate and short - term local weather. It is responsible for temperature and other weather patterns on earth. It blocks most of the Sun's Ultraviolet Radiations (UV), conducts solar radiation and precipitation through constantly moving air masses, and keeps our planet's average surface temperature to about 15° Celsius.
- The atmosphere has a layered structure. From the ground toward the sky, the layers are the troposphere, stratosphere, mesosphere, thermosphere and exosphere. Upto 75% of the total mass of the atmosphere is in the troposphere, where most weather occurs.
- Generally, the earth has four seasons namely; winter, spring, summer and rainy.

## Mars (Mangal) :-

- Mars is the fourth planet from the Sun and is the second smallest planet in the solar system.
- Mars has the largest dust storms in the solar system which can last for months and cover the entire planet.
- Mars is a rocky body about half the size of earth.
- Mars is home to the tallest mountain in the solar system named Olympus Mons, a shield volcano, which is 21 km high and 600 km in diameter .
- Mars appears slightly reddish so it is also called red planet. Mars has two small natural satellites named Phobos and Deimos.

## Jupiter (Brihaspati) :-

- The planet Jupiter is the fifth planet out from the Sun, and is two and a half times more massive than all the other planets in the solar system combined.
- It is made primarily of gases and is therefore known as a **gas giant**.



TEST SERIES  
Bilingual

ab

**MPTET  
PRT 2020**

10 TOTAL TESTS

- It is the largest planet of the solar system (about 1300 earth can be placed inside the Jupiter).
- Mass of Jupiter is about 318 times that of our earth.
- It has a large number of satellites amongst which four are visible from a telescope easily.
- It has a faint ring around it.

### Saturn (Shani) :-

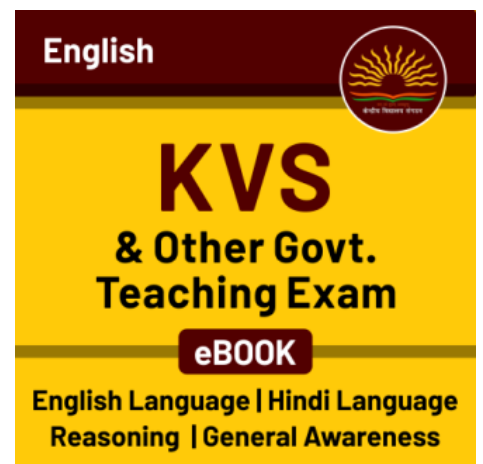
- Saturn is the second largest planet and is best known for its fabulous ring system.
- Saturn is a gas giant and is composed of similar gasses including hydrogen, helium and methane.
- Saturn is the flattest planet. Its polar diameter is 90% of its equatorial diameter. This is due to its low density and fast Rotation.
- Saturn appears yellowish in colour. It has a large number of Satellites and some beautiful rings around it.
- Saturn is least dense among all the planets. Its density is less than that of water.

### Uranus :-

- With minimum atmospheric temperature of - 224°C Uranus is nearly **coldest planet** in the solar system. Thus, it is often referred to as an ice giant.
- Uranus has an atmosphere which is mostly made up of liv hydrogen (H<sub>2</sub>) and helium (He), with a small amount of methane (CH<sub>4</sub>).
- Uranus has 13 known rings. The inner rings are narrow and dark and the outer rings are brightly coloured.
- Uranus has 27 moons.
- Uranus rotates from East to West and has highly tilted axis that its motion appear to roll on its side.

### Neptune :-

- Neptune is the eighth planet from the Sun making it the most distant in the solar system.
- Its equatorial clouds take 18 hours to make one rotation. This is because Neptune is not solid body.
- Below its heavy atmosphere, Uranus is made of layers of hydrogen, helium and methane gases. They enclose a layer of water, ammonia and methane ice. The inner core of the planet
- is made of rock.
- Neptune has a very thin collection of six rings. They are likely made up of ice particles mixed with dust grains and possibly coated with a carbon - based substance.
- Neptune has 14 moons. The most interesting moon is Triton, a frozen world that is spewing nitrogen ice and dust particles out from below its surface.



### **Asteroids :-**

- These are the small celestial bodies found in the gap between the orbits of Mars and Jupiter. They are rich in precious metals and other metals, as well as water.
- Asteroids are solid, rocky and irregular bodies.
- **Ceres** the first and largest asteroid to be discovered in 1801 by Giuseppe Piazzi, encompasses over one-third of the estimated total mass of all the asteroids in the asteroid belt.
- Asteroids are also referred to as minor planets or planetoids.

### **Comets :-**

The celestial bodies revolving around the Sun in very long elliptical orbits. It appears as a bright head with a long tail whose length increases as it approaches the Sun. Tail of a comet is always directed away from the Sun.

### **KEY FACTS :-**

**One of the known comets is Halley's comet which appears nearly after every 76 years.**

### **Meteors and Meteorites :-**

- The bright streaks of light in the sky commonly known as shooting stars although they are not stars and are called as meteors.
- When small celestial objects enter into Earth's atmosphere get heat up due to friction. Thus, they glow and then evaporate.
- Some meteors are larger in size and hence, they reach to Earth's surface before evaporating. These are called meteorites.

### **Meteor Shower :-**

When the Earth crosses the tail of a comet, swarms of meteors are seen. These are known as meteor showers.

### **Artificial Satellites :-**

- The satellites launched from the Earth are called artificial satellites.
- The first Indian satellite was **Aryabhata**.
- Some other Indian satellites are **INSAT, IRS, Kalpana - I, EDUSAT etc.**
- Artificial satellites are used for forecasting weather, transmitting television and radio signals, telecommunication and remote sensing.

TEST SERIES  
Bilingual



**UGC NET  
PAPER I**

**15 Full-Length Mocks**