

Q.1 a) Explain Life-cycle of Star (SUN) •

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## 1. Introduction:

A star is a giant ball of hot gas that shine in the sky. Stars are made up of hydrogen, helium and other gases. They produce light and heat through a process called nuclear fusion. The life-cycle of a star begins with the process called nebulae forming a dense core called a protostar. From here it enters a main sequence stage where stars become like sun. Moreover, from there they go through fusion of helium to carbon to neon to oxygen which eventually ended as supernova or new dust planets.

## 2. Stages of Life-Cycle of Star:

Star forms with the process called nebula. A star consists of dust particles, gases, element and matter which come together and starts burning. Formation of a star goes through certain stages which are discussed below:

### a. The Main Sequence Stage:

This is the first stage of star's life cycle. In this stage almost 90% of its process occurs. Here two elements of hydrogen fused together and form

Helium 2 with exothermic fusion reaction.

### b. The Giant phase stage:

In this stage two elements of helium will burn by fusing together to form Carbon atom.

$He^2 + He^2 = C^6$ . By doing this 3 times more energy will be produced.

### c. The Carbon Burning stage:

In this stage, carbon will be burnt fused at the core of star and Neon will be formed.

### d. The Neon, Oxygen, and Silicon Burning Phase:

Here the fusion process of neon will be resulted in the formation of oxygen. After this oxygen will be fused to form silicon element.

### e. The Massive-Star Explosion Phase:

In this stage two paths are expected. Either Supernova which means death of star or medium star reverses which forms white dwarf planets. The explosion result in spread of its material after which core of star fold itself to form a black hole.

### 3. Conclusion:

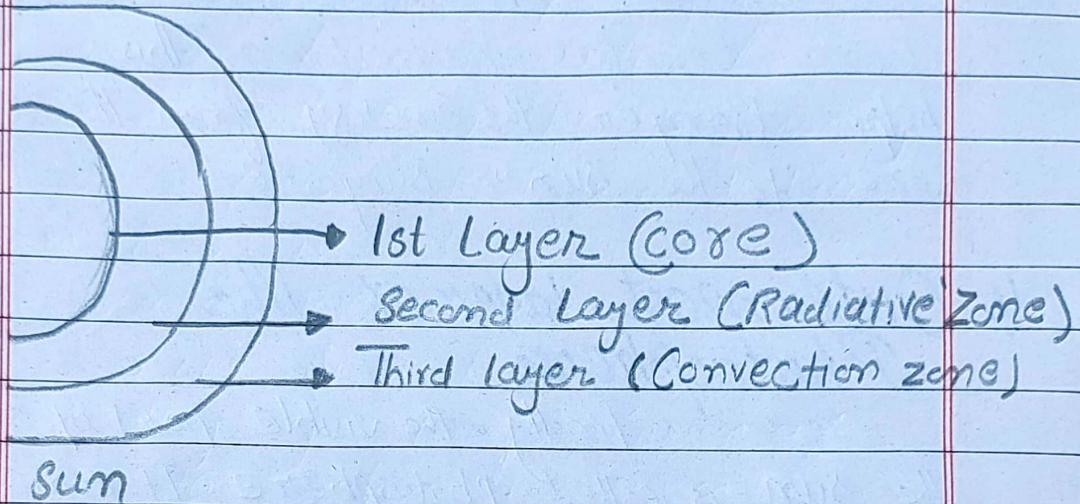
All the objects involved in life cycle of stars have incredible gravity. Or cosmic phenomenon.

b) Discuss structure of the SUN

(5)

Ans

The sun is a massive star made of helium and hydrogen. It has different layers illustrated and discussed below:



**1. The Core:** At the very center of the sun is the core. It is super hot and has pressure which causes hydrogen atoms to smash together to form helium. This process is called nuclear fusion, which releases a tons of energy in the form of light and heat.

**2. Radiative Zone:**

In this layer energy makes its way outward. Here the game of 'pass the energy' happens. The photons bounce around and get absorbed by the particles.

in the radiative zone.

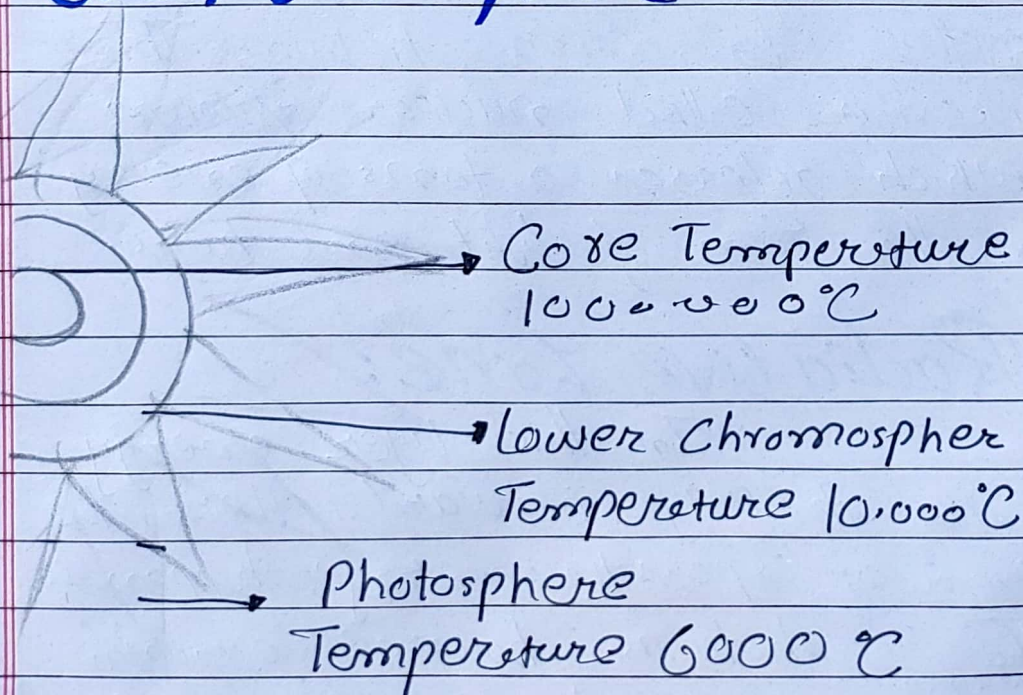
### 3. Convection Zone:

Above the radiative zone, there is convection zone or the upper part of the sun. Here the hot plasma rises up from the depth of the sun, while cooler plasma sinks back down. This helps transfer the energy from the core to the sun's surface.

### 4. Outermost layer or the Photosphere:

Finally, the visible part of the sun is called photosphere. It can be visible from the earth. Above it there is the chromosphere which is thin layer of hot glowing gas.

### 5. Solar Atmosphere:



d Explain galaxy and shed light on characteristics of Milky way also discuss future of Milky way. /s

## 1. Introduction:

Galaxy is a kind of cosmic city having millions of stars, planets, gas, dust etc. Milky way is an example of galaxy - its characteristics are including spiral shape, nebulae, stars etc. It is where solar system located. Moreover, it has black hole at the center known as Sagittarius A\*. The future of Milky way is uncertain, however, some astronomers predicted that it will collide with its neighbouring galaxy to form milkomeda.

## 2. The Science of Galaxy:

Galaxy is a gravitationally bound system consisting of stars, planets, dwarf planets, black holes and other small solar system bodies such as asteroids, meteoroids etc.

## 3. Types of Galaxy:

- Elliptical Galaxy
- Spiral galaxy
- Irregular galaxy
- Lenticular Galaxy

#### 4. Characteristics of Milky way:

Milky way is galaxy which is spiral in ~~ed~~ and it is where our solar system located. Following are some of the characteristics of milky way:

- It has 100 to 400 billion stars
- It is stationed in Orion
- Distance from solar-system is nearly 27,200 light years
- Home to solar-system
- Its diameter is 100,000 to 180,000 light year.

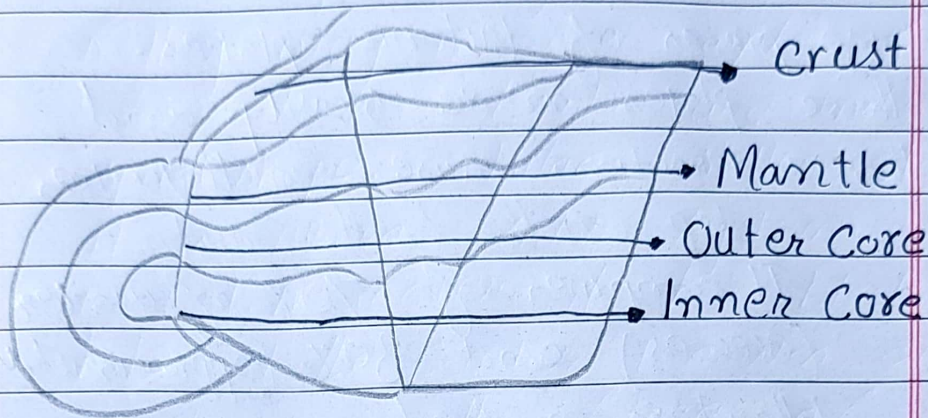
#### 5. Future of Milky way - Milkmeda:

It is predicted that the neighbouring galaxy of milky way - Andromeda will collide with our galaxy milky way. Because both galaxies are drawing nearer to each other. As a result of it it will collide and form another galaxy called Milkmeda. Therefore, formation of milkmeda is forecasted as the future of Milky way.

#### 6. Conclusion:

The Milky way is a spiral galaxy with billions of stars including our Sun. The future of our galaxy is its collision with nearer galaxy andromeda.

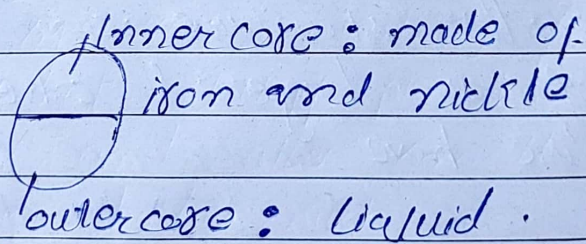
Q What is the structure of Earth?  
Ans The structure of the earth is like a big layered cake. Earth is third nearest planet to the solar system. The earth has following structure:



Earth's Structure

## 1 Core - Central Part of the Earth:

At the very center of the earth, there is a core. It is divided into two parts: the inner core and the outer core.



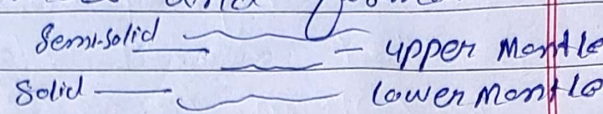
It is super-hot and has pressure which generates the Earth's magnetic field.

## 2. Mantle - the Second Layer:

It is mostly solid.

It is made up of magma made up of semi-molten rock.

It is responsible for the movements of tectonic plates, which causes earthquakes, volcanoes and formation of mountains.



### 3. Crust - the Upper-most layer:

The crust is divided into large pieces of tectonic plates. These plates move slowly, and their interaction cause earthquakes.

#### Top of the Earth's Crust

It comprises of 70% of water (oceans) and 30% (approximately) lithosphere or land.

#### Continents

These land masses are made up of different types of rocks etc.

### 4. Conclusion:

To sum it up, the Earth's structure can be thought of as layered cake. Firstly we have inner core solid, outer core liquid, the mantle and the thin crust. These layers work together to create the earth's magnetic field and the movement of tectonic plates which result in the formation of outer structure of the earth.