Life Cycle of Stars

EXERCISE [PAGE 134]

Exercise | Q 1.01 | Page 134

Search and you will find.

1. Our galaxy is called _____.
2. There are about _____ stars in our galaxy.
3. Milky way is a _____ galaxy.

Solution: 1. Our galaxy is called **Milky way.**

2. There are about **billion** stars in our galaxy.

3. Milky way is a **spiral** galaxy.

Exercise | Q 1.02 | Page 134

Search and you will find.

For measuring large distances _____ is used as a unit.

Solution: For measuring large distances **light year** is used as a unit

Exercise | Q 1.03 | Page 134

Search and you will find.

The speed of light is _____ km/s

Solution: The speed of light is **3,00,000** km/s

Exercise | Q 1.04 | Page 134

Search and you will find.

The end stage of the sun will be _____.

Solution: The end stage of the sun will be **white dwarf.**

Exercise | Q 1.05 | Page 134

Search and you will find.

Stars are born out of _____ clouds.

Solution: Stars are born out of **interstellar** clouds.

Exercise | Q 1.06 | Page 134

Search and you will find.

Stars are spheres of _____ gas.

Solution: Stars are spheres of **hot** gas.

Exercise | Q 1.07 | Page 134

Search and you will find.

The masses of other stars are measured relative to the mass of the _____.

Solution: The masses of other stars are measured relative to the mass of the **Sun.**

Exercise | Q 1.08 | Page 134

Search and you will find.

Light takes _____ to reach us from the moon.

Solution: Light takes **1 s** to reach us from the moon.

Exercise | Q 1.09 | Page 134

Search and you will find.

The larger the mass of a star the faster is its _____

Solution: The larger the mass of a star the faster is its **rate of evolution**.

Exercise | Q 1.1 | Page 134

Search and you will find.

The number of fuels used in the life of a star depends on its _____

Solution: The number of fuels used in the life of a star depends on its **mass.**

Exercise | Q 2 | Page 134

Who is telling lies?

a. Light year is used to measures time.

b. End stage of a star depends on its initial mass.

c. A star ends its life as a neutron star when the pressure of its electrons balances its gravity.

d. Only light can emit from the blank hole.

e. The sun will pass through the supergiant stage during its evolution.

f. The Sun will end its life as a white dwarf.

Solution: a. It is lying as light year is used to measures distance.
b. It is telling the truth as the end stage of a star is decided by its mass.
c. It is lying because a star ends its life as a neutron star when the pressure of its neutrons balances its gravity.
d. It is lying as nothing can be emitted from black hole, not even light.
e. It is telling the truth as the Sun will pass through the giant stage during its evolution. So, its end stage will be as white dwarf.

Exercise | Q 3.1 | Page 134

Answer the following question.
How do stars form?
Solution: Spaces between the stars present in a galaxy are occupied by huge clouds of gas and dust, known as interstellar clouds. Contractions happen in this cloud due to some natural disturbance. Because of this, the density and temperature in the cloud starts increasing and a dense sphere of hot gas is formed from the cloud. Nuclear energy (energy released due to fusion of atomic nuclei) is generated with the burning of fuel, like hydrogen and helium, in the sphere when it attains a sufficient amount of density and temperature at its centre. Due to this energy generation, the gas sphere becomes self luminous and thus a new star is formed.

Exercise | Q 3.2 | Page 134

Answer the following question.
why do stars evolve ?
Solution: Star loses its energy constantly due to continuous emission of light and energy. This means that the temperature of a star decreases continuously and hence its gas pressure which thereby decreases its stability. But we know a star is very stable. So, to maintain the stability of a star, its temperature is maintained constant with the help of energy released by the burning of fuel at its centre. This burning and therefore the decrease in the amount of fuel is the reason for the evolution in the stars.

Exercise | Q 3.3 | Page 134

Answer the following question.
What are the three end stages of stars ?

Solution: Three end stages of stars are:

- **White dwarf**
  - Density of star is very high compared to that of Earth
  - Small sized and very stable
  - Appears white in colour
  - Initial mass < $8M_{Sun}$
- **Neutron star**
  - Completely made up of neutrons
  - Stable in nature
  - Initial mass $8M_{Sun}$ < M<$m_{Star < 25MSun</m}$
- **Black hole**
  - Gravitation pull is very strong
  - Absorbs everything, even the light rays falling on it
  - Appears as black hole
  - Initial mass > $8M_{Sun}$

Exercise | Q 3.4 | Page 134

Answer the following question

Why was the name black hole given ?

Solution: All the light rays falling on black hole gets absorbed. Because of this we cannot see this star at all but can probably see a minute black hole at its place. Thus, the name black hole is given to this star.

Exercise | Q 3.5 | Page 134

Answer the following question.

Which types of stars end their life as a neutron star?

Solution: The stars whose initial mass is between 8 to 25 times the mass of the Sun, end their life as a neutron star.

Exercise | Q 4.1 | Page 134

If you are the sun, write about your properties in your own words.

Solution: Following are the various properties of me as a Sun:

- I am 4.5 x 10^9 old.
- I have my own heat and light.
- I am made up of hot gases. Hydrogen contributes to 72% of my mass while helium about 26%. The rest 2% is associated with elements heavier than helium.
- My mass and radius is about 2×10^{30} and 695700 km, respectively.
- My surface temperature is about 5800 K and temperature at the centre is 1.5 x 10^7 K.

Exercise | Q 4.2 | Page 134

Describe white dwarfs.

Solution: White dwarfs are the end stage of low mass stars. These are those stars

- whose density is very high compared to that of Earth
- which are very stable and small sized
- which appears white in colour
- whose initial mass < $8M_{Sun}$