

DAY: Tuesday

DATE: 9-12-25

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CSS'26

GSA-I Mock #5

QNo: 2(a)

Difference between

STAR

PLANET

* A celestial body made up of a mixture of numerous gases that may or may not orbit around any planet, is called star.

* Stars randomly exist in space without any solar system.

* Stars are not categorized as planets.

* Stars exist at a distance of millions of light years away from each other.

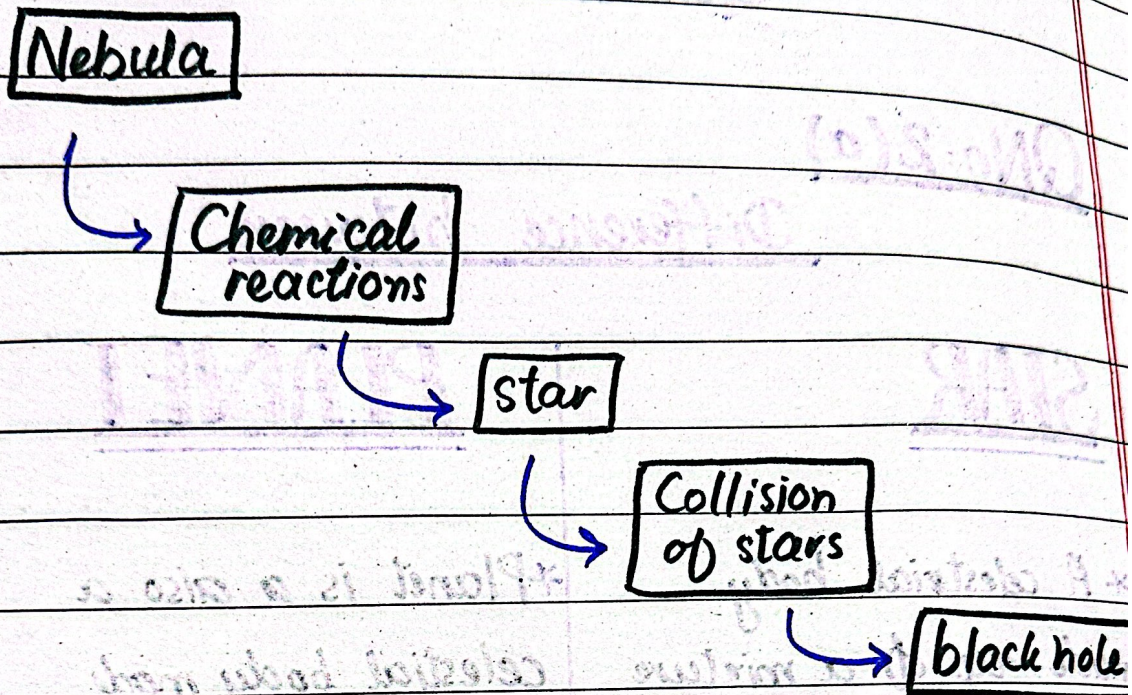
* Planet is also a celestial body made up of sedimentary rocks and numerous gases and has its own specific solar system in which it orbits daily.

* Planets have their own specific solar system.

* Planets can be categorized as stars.

* Planets exist at a finite distance collectively in a solar system.

Life Cycle of a Star



1. Nebula:

In the initial stage stars exist in the raw form of numerous gases or rocks or liquids known as nebula.

2. Chemical reactions:

The gases in nebula, over the time began to react with each other.

3. Star:

As a result of these chemical reactions among gases, a strong, bright and large celestial body is created known as star.

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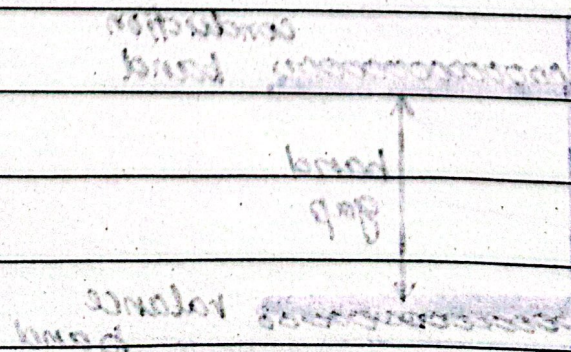
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4. Collision of stars:

By the passage of time when two giant stars approach each other and began to die a massive collision is happened/occurs between them.

5. Black hole:

As a result of this massive collision, a black hole is created with an infinite and strong gravitational force.

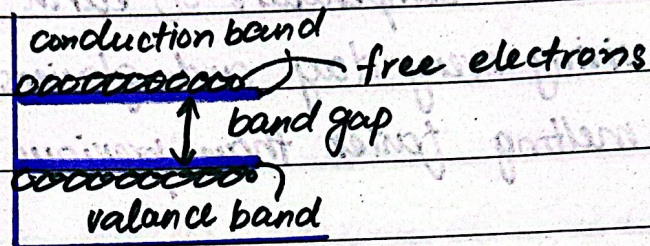


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P-type semiconductor.

The semiconductor in which the band gap between valance band and conduction band is relatively small are known as p-type semiconductors.



Modern applications:

Some modern applications of n and p-type semiconductors are as follows:-

- Widely used in solar pannels.
- Used in wind turbines.
- Used in the mechanics of plane engine.
- Play a significant role in the formation of super computers and quantum computers.
- They are used in quantum clocks.

Qno: 2 (c)

Global Warming

"Global warming is a man-made phenomena due to which the annual temperature of earth is rising every day and glaciers are melting faster than previous times"

Global warming is a time ticking bomb, knocking at our doors: created due to massive exploitation of natural resources and exacerbation of pollution in natural environmental fabric of planet earth.

Due to global warming temperature of earth is rising, glaciers are melting, sea level is rising and ozone layer is depleting.

Mechanism of greenhouse effect

Green house effect is another man made multi-dimensional issue. In green house effect, the ultraviolet rays or sunlight that reaches the earth

surface remain trapped in the environment due to air pollution and depletion of ozone layer. These trapped UV rays and heat waves affect the planet by increasing its temperatures.

The harmful UV rays are dangerous for humans as well as for biodiversity.

Industrial pollution, chemical gases released by vehicles, burning of fossil fuels and the gases released as a nuclear waste in nuclear reactors play a crucial factor in driving green house effect. Three major green house gases are:-

- Chloroflouro Carbons
- Sulphur dioxide
- Nitrogen oxide

Former U.S president, Barak Obama while addressing about global warming said that,

"We are first generation to experience the effects of global warming and the last one who can do something about it."

Qno: 2(d)

Tsunami

"Tsunami is a natural disaster that can be triggered due to some violent earthquake or tectonic activity creating a strong force in the sea waves"

It is a natural disaster in which huge water waves began to travel to coastal areas, often triggered by some strong earthquake.

Cities present at coastal areas are at a high risk of Tsunami. Tsunamis are extremely disastrous and dangerous as they wash away whole cities whenever they happen. The great Tsunami of Japan is historic, that costed hundreds of deaths and a huge economic and infrastructural loss to Japan.

Mechanism of a Tsunami

→ Tsunamis are not sudden or unprecedented rather they are triggered by strong earthquake, any strong volcanic eruption nearby or movement of tectonic plates under the sea bed.

→ In case of any such activity like earthquake or movement of tectonic plates, sea is jolted.

→ Due to this sudden jolt, sea waves experience strong kinetic forces that drives them to coastal areas.

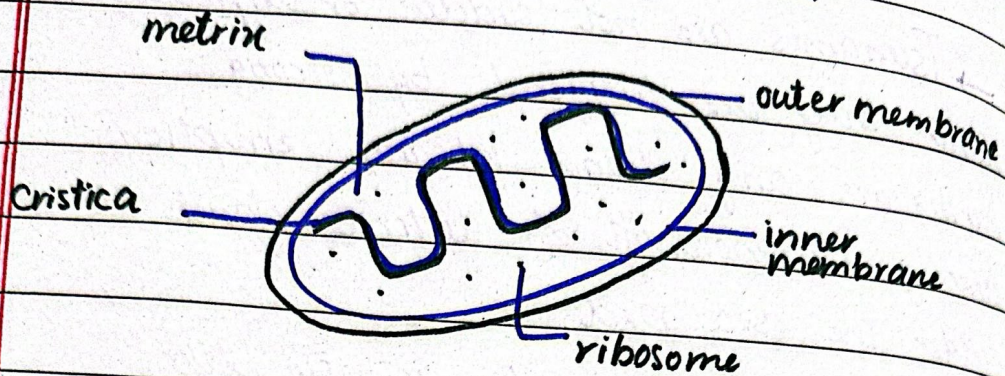
→ The kinetic energy is so high that it enable tsunami to form waves of few feet high.

→ When these waves meet at coastal areas, they become extremely disastrous and have potential to gulp entire coastal cities.

→ The damage to coastal areas is unpredictable because the potential of tsunamis depend upon the kinetic potential of strong waves.

QNo. 3(a)

Mitochondria



Structure of mitochondria:

A mitochondria is

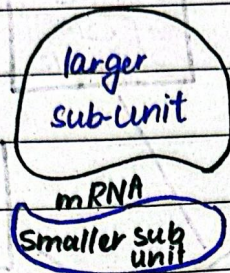
cell organelles and it comprised of:

- An outer membrane
- An inner membrane
- Cristica (structure enclosing DNA)
- Ribosomes
- Matrix (plasma or fluid substance inside it)

Functions of mitochondria:

- A mitochondria regulates and manages the proper functioning of cell.
- It is responsible for proper functioning of rest cell organelles.
- It regulates the entry and exist of other material inside cell.
- It regulates the health and sustainable functioning of cell.

Ribosomes



• Ribosomes

Structure of ribosome

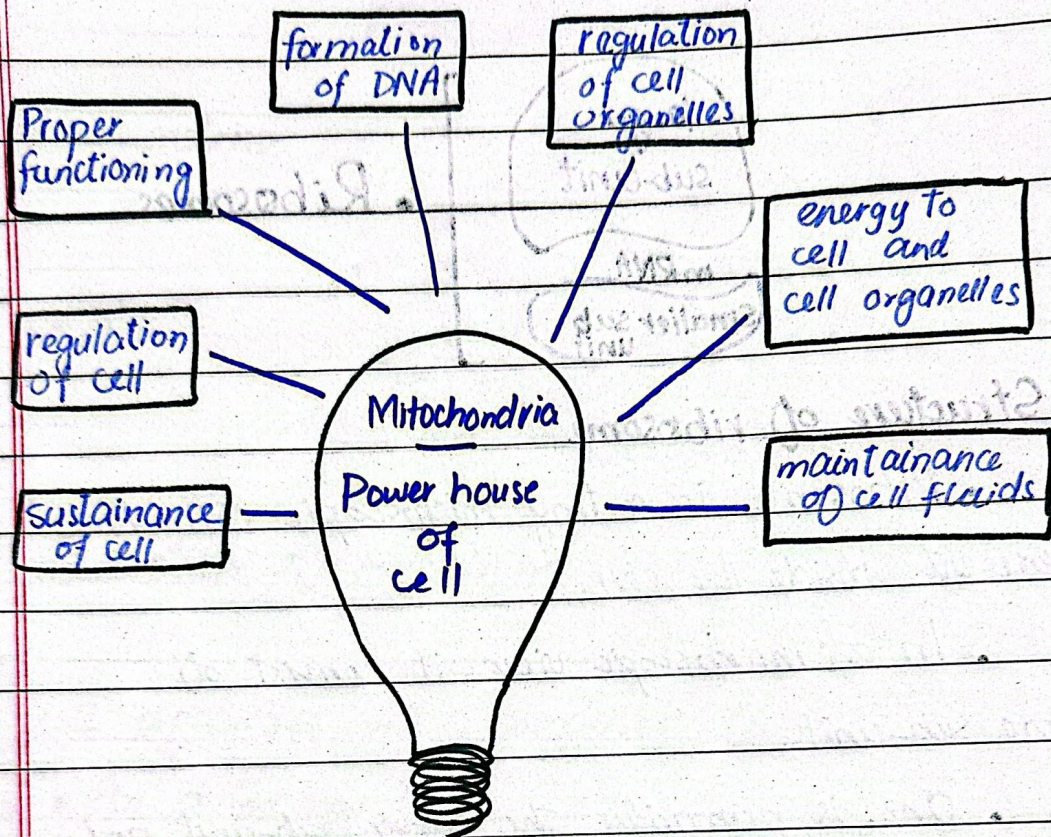
- Ribosome is a tiny microscopic structure present inside the cell.
- In a microscopic view, it consists of two sub-units.
- One is primarily the larger sub-unit and the other one is smaller sub-unit.
- Between these sub-units there lies a small chain of ribonucleic acid mRNA, which helps in formation of DNA.

Function of ribosome

- Ribosomes are present inside cell, that too specifically inside mitochondria.
- The mRNA in ribosomes helps the structural formation and duplication of deoxyribonucleic acid DNA.
- Here, it plays a crucial role of copying and duplication information from previous generation without any mutation.

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The bulb in the figure illustrates mitochondria as the power house of cell.

Qno: 3 (b)

Enzymes

"Enzymes are the catalyst that speed up a metabolic reaction but remain unchanged at the end of reaction."

Some common examples of naturally occurring enzymes are:

- protease
- Lipase
- Pepsin
- Pepsinogen
- Maltase

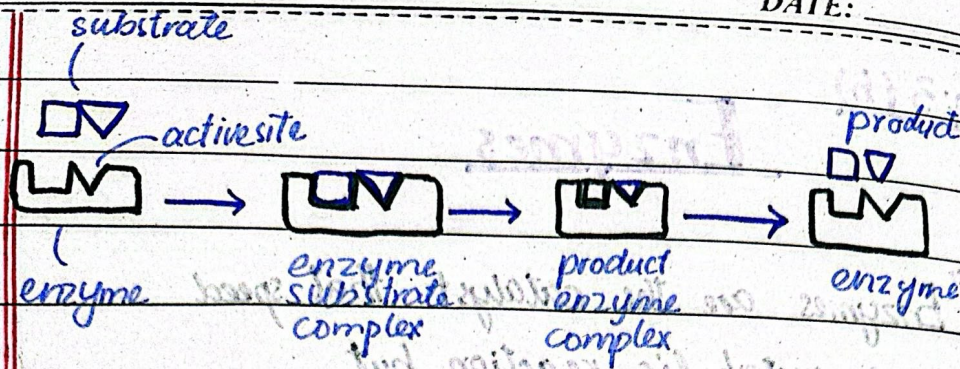
They act as catalyst and assist the speed of metabolic processes in human body.

Lock & Key Model

Lock and key model of enzymes was discovered by Ernile Fisher in 1864. He was a german chemist who proposed the functioning and structure of enzymes as lock and key model. During any metabolic process, enzymes passes through a series of event to speed up the reaction without changing the activity of reactants and products.

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According to lock and key model, every enzyme has its specific substrate that act as a key for that enzyme. Just like a key with specific teeth fits exactly into its lock, likewise the enzyme and substrate. Every substrate fits into its specific active site of enzyme to form an enzyme-substrate complex.

Factors affecting enzyme activity

The two factors that affect the enzyme activity are temperature and pressure. Under optimum pressure and temperature they can perform. When the temperature and pressure exceeds this optimum number, the enzyme ruptures or its proper functioning is hindered.

Qno: 3(c)Renewable energy

Renewable energy is a form of energy that can be used multi-dimensionally over and over again and it is a sustainable energy source.

- Renewable energy include wind energy, solar energy, hydro energy, etc.
- It is an inter-conversional energy.
- It is safe and reliable energy.
- It is environment friendly and life supporting.

Non-renewable energy

Non-renewable energy is a one time use energy, that is if it is once used it cannot be reused or recycle again. That is why it is non-sustainable source of energy.

- Non-renewable energy is obtained from fossil fuels like coal, petroleum, gasoline, etc.
- It is non-interconversional energy.
- It is harmful for environment, thus non-reliable.
- It is a finite energy and non-friendly to nature and environment.

Potential of wind energy as sustainable source

Wind energy is a great source of renewable and sustainable energy. The wind turbines with large fans are used to generate wind energy during windy and stormy weather. The strong force of wind moves the wind turbines generating a sustainable and reliable source of energy. The developed countries are relying on wind energy as their source. China has large farms of wind energy supporting thousands of homes by supplying a sustainable and reliable amount of energy.