

Part II

Question. No. 3

q. Why cells form organelles
Discuss mitochondria in a
Human Cell.

Purpose of the Organelles

What are Organelles?

Organelles are the tiny cell organs present inside it. They are so tiny that they cannot be seen with naked eyes. Microscope is used to observe the structure and function of these tiny organs. Further, different organelles perform different function inside the cell.

Why are they formed?

Cells form organelles because it requires them to survive. Cell, like human, is nothing without its organs. For instance, ribosome carries genetic information, nucleus controls the activity of cell and so on.

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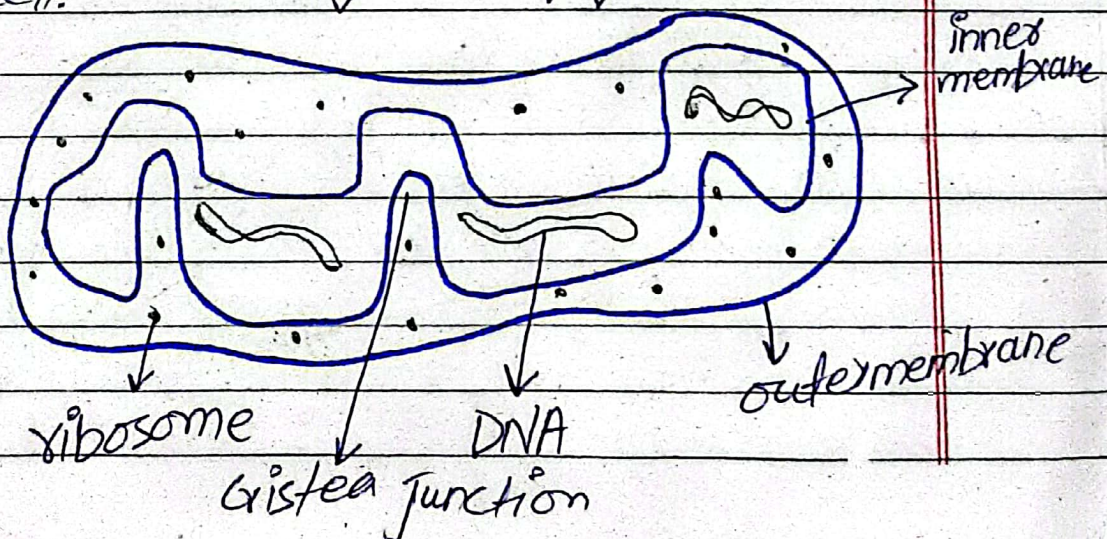
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Other key purpose behind the organelles formation are as follow

- 1- Each organelle is dedicated to a distinct task.
- 2- Organelles maintain an optimal environment within the cell.
- 3- They protect the cell from harmful reactions and toxic substances.
- 4- Folded organelles such as mitochondria increases surface area of the cell.

Mitochondria

Mitochondria are an important part of the cell. They are present in different sizes and at different location. Mitochondria are referred to as the Power House of the cell. It is because they manufacture and supply energy to the cell.



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Fuction of Mitochondria

- Metabolic Processes
- Energy Formation
- Energy supply

(b) What is Doping?
Discuss Different types
of Semi-conductors.

1- Doping

Doping is the process of adding impurity atoms to the semiconductor. This process is used to enhance the capacity of the semiconductor to conduct electric charge. For this purpose, Electron-Deficient atoms such as Aluminum which has 3 electrons in its outermost shell is used. Similarly, Electron-Rich atoms such as Phosphorus which have 5 electron is used to add into the semiconductor.

2- Types of Semiconductors

There are two types of semiconductors;

- N-Type of semiconductor
- P-Type Semiconductor

2.1 N-Type Semiconductor

It is such type of semiconductor in which an electron (e^-) rich impurity is added. Electron-rich impurity such as Phosphorus is added to replace some of the silicon atoms. It then starts bonding with the neighboring silicon atoms.

Four electrons of Phosphorus make bonds with four silicon atoms, leaving one atom loosely bonded to phosphorus. This freely moving electron carries charge, hence increases conductivity. Because these electrons have negative charge, thus such type of conductors are referred to as Negative-Charge Carrier or N-Type semiconductors.

2.2 P-Type Semiconductor

To make this type of conductor, electron-deficient atoms are added into the silicon crystal such as Aluminum. The three Al electrons make bonds with the three electrons of silicon. However, one electron of silicon is left

free, creating a Hole. This Hole has a positive charge and other electrons start jumps to fill this hole, making hole at their own place. Thus, due to the positive charge of the hole, it is referred to as the Positive or P-type semiconductor.

C- State some merits and demerits of Volcanic eruption.

Merits of Volcanic eruption

①- Volcanic ash and weathered lava are rich in minerals like potassium and phosphorus, creating most fertile agricultural soil on Earth.

②- Volcanic possesses concentrate valuable metallic minerals, including gold, silver and copper.

③- Eruption add new rocks to the earth's surface, creating new islands like Hawaii.

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Demerits of Volcanic eruption

- ① - Eruption releases large quantities of poisonous gases, having adverse health effects.
- ② - Eruption can also cause acid rain as gases from volcanoes mixes with atmosphere.
- ③ - It can also lead to secondary hazards such as earthquakes and tsunamis.