Part - II
SECTION - I

Q NO. 2
(a)

difference

Star	Planet
A massive, self-luminous Celestial body that produces light and heat through nuclear fusion (e.g Sun).	A non-luminous body that Orbits a star, reflects its light, and does not undergo fusion e.g (earth).

Life Cycle OF a Star

- **Nebula:** A cloud of gas and dust collapses under gravity.

- **protostar:** Temperature and pressures rise forming a young star.

- **Red Giant:** Star expands as hydrogen depletes
- **Supernova:** Massive stars explode after fuel exhaustion
- **Black hole:** if the remaining core is extremely massive, it collapses into a black hole with intense gravity.

(b)

Semiconductors:

Materials whose electrical Conductivity lies between Conductors and insulators, Conductivity increase with temperature.

e.g, Silicon, Germanium

Difference

- n-type Semiconductor
- p-type Semiconductor

n-type Semiconductor	P-type semiconductor
• Doped with pentovalent (5-electron) impurities eog (phosphorus).	• Doped with trivalent (3. electron) impurities eog (boron).
• Extra electrons make electrone the majority Carriers	• Creates "holes", making holes the majority Carriers.

Modern Applications:

1. Diodes and transistors
2. Solar cells and LEDs

(C)

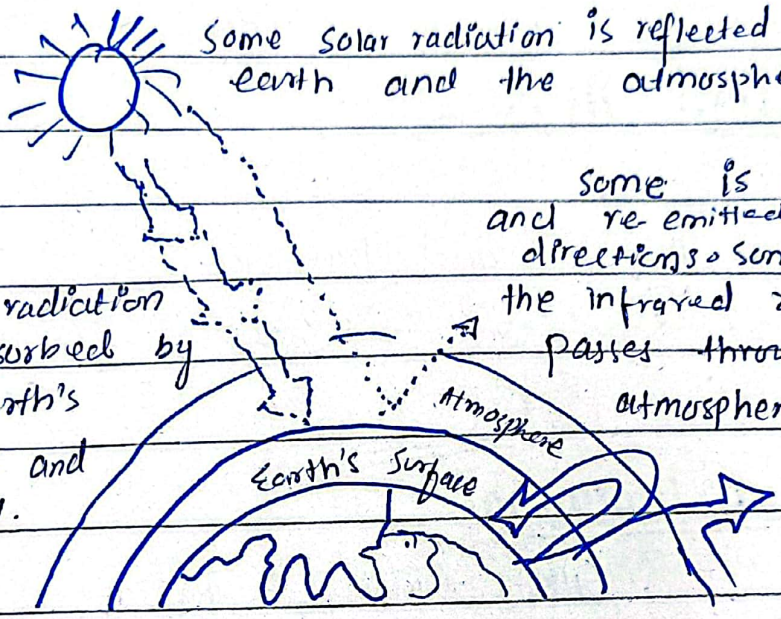
Global warming:

Global warming is defined as the increases in the earth's temperature due to the use of fossil fuels and other industrial processes leading to a build up of greenhouse gases in the atmosphere.

Green house Gas:

Green house gases (GHGs) are atmospheric gases that trap heat by absorbing infrared radiation emitted from earth's surface, warming the planet through the greenhouse effect

Greenhouse Effect:



Major Greenhouse Gases:

1. Carbon dioxide (CO_2)
2. Methane (CH_4)
3. Nitrous oxide (N_2O)

(d)

Tsunami:

Tsunami is a ~~series~~ Series of massive Ocean waves triggered by Sudden, large-Scale Seafloor displacement from earthquakes, landslides.

Natural Processes:

- Earthquakes
- Land Slides
- Volcanic Eruptions
- Meteorite Impacts

- **Earthquakes:** 80% of tsunamis occur when an undersea earthquake causes vertical movement of the ocean floor.
- **Land Slides:** Submarine or Coastal landslides displace water rapidly
- **Volcanic Eruptions:** underwater or Coastal Volcanic explosions can create massives waves.

Potential impact:

Destruction

Flooding

Erosion

Loss of life

Economic Disruption

- **Destruction:** powerful waves destory buildings, infrastructure & settlements.
- **Flooding:**

  Water travels far inland, causing widespread flooding.
- **Erosion:**

  Soil erosion and salt contamination of freshwater sources occur.
- **Loss of life:**

  High death tolls due to drowning and debris.
- **Economic Disruptions:**

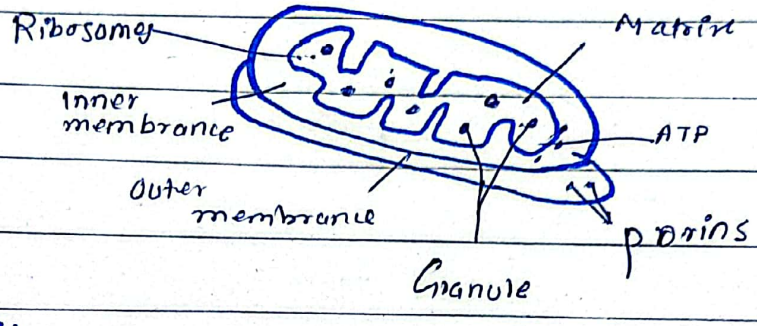
  Loss of industries, homes, and tourism.

Q NO-3:

(a)

Mitochondria:

The mitochondria is the organelle where chemical energy is produced through cellular respiration.



Structure:

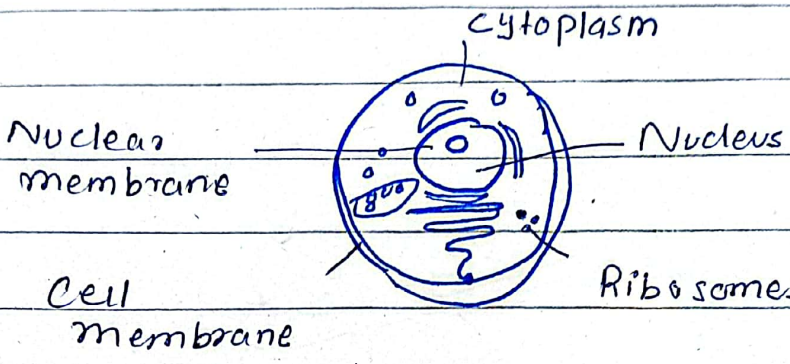
Double-membrane organelle, outer membrane smooth; inner membrane folded into cristae; central matrix contains enzymes.

Function:

Performs cellular respiration, breaking down glucose to produce ATP, the energy currency of cell.

Ribosomes:

A ribosomes is an intercellular structure made of both RNA and protein, and it is the site of Protein synthesis in the cell.



Structure: Small, dense particles made of rRNA + proteins, found free in cytoplasm or attached to rough ER.

Function:

Responsible for protein synthesis by translating mRNA into amino acid chains.

Why mitochondria is Called "Power house":

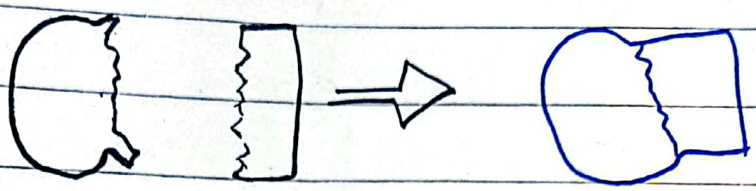
Because it produces most of the cell's ATP during respiration, providing energy for all cellular activities.

(b)

Enzymes:

Biological catalysts made of proteins that speed up chemical reactions without being used up.

Lock and Key model



Enzyme + Substrate → Enzyme - Substrate Complex

- Enzymes has to a specific active site shaped exactly to fit its substrate.
- This process explain enzyme specificity.

Factors Affecting:

1. **Temperature:** High temperature denatures enzymes).
2. **PH:** Each enzyme works best at an optimum PH.

(c)

Difference between Renewable and non-renewable Resource

Renewable Resources	Non-Renewable Resource.
Depletion	
Renewable resources Cannot be depleted over time	non-renewable resource deplete over time
Sources	
it include sunlight water, wind and also geothermal sources	it includes fossil fuels such as coal and petreoleum.
Environmental Impact	
low carbon emissions and low carbon foot print.	has a comparatively higher carbon footprint and carbon emissions.

Potential OF wind Energy:

Clean, renewable, and Produces no (GHG_s)

it can reduce dependence on fossil fuels.

Abundant in many regions and cost-effective with modern turbines.

(d)

Dengue Fever:

A viral disease caused by the dengue virus (DENV), affecting blood vessels and platelets.

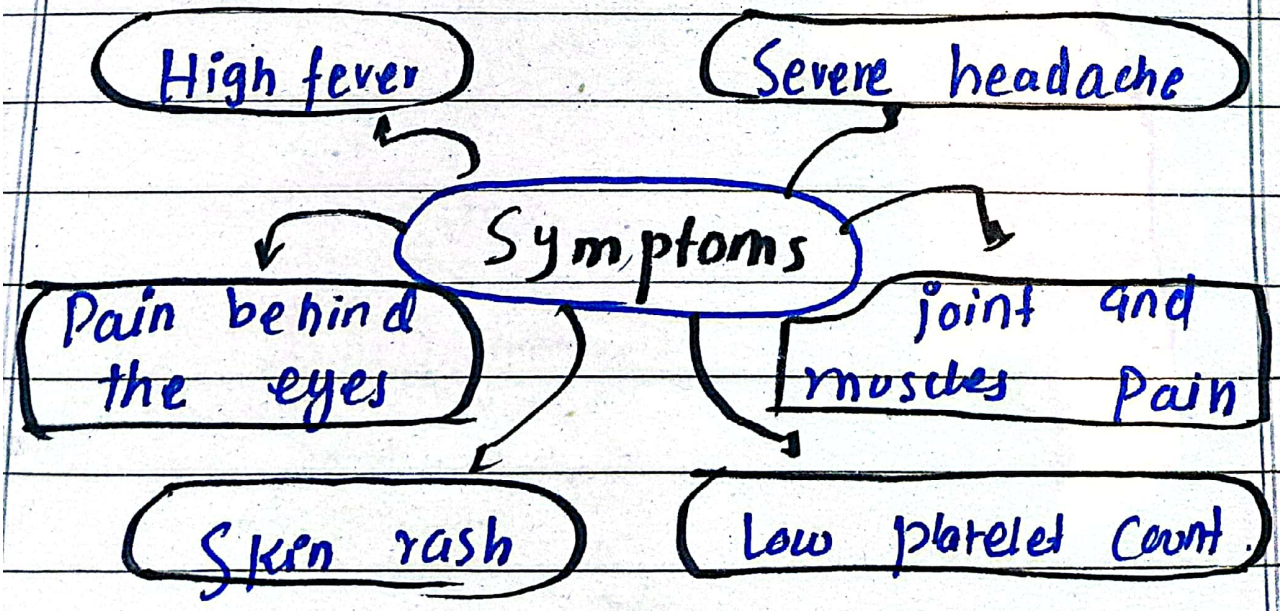
How Dengue is transmitted?

1. **Mosquito Cycle:**

An Aedes mosquito (often Aedes aegypti or Aedes albopitus) bites a person infected with the dengue virus.

2. **Human Infection:**

The infected mosquito than transmits the virus to another person via bite.



Preventive Measures:

- Remove standing water where mosquitoes breed.
- Use mosquito repellents and nets.
- Wear full - sleeve clothing.
- ~~Fra~~ Fumigation and Community mosquito Control.
- Keep water Containers Covered.