25/10

GSA - 02
Batch : 59
Hamna Zainab

QUESTION - 01

Cell a basic unit of life. Explain structure and function of cytoplasm, plastids, nucleus.

CELL : UNIT OF LIFE

Cell is the basic structural and functional unit of life, fundamental for all biological activities. They are essential to provide support, growth, metabolism and reproduction to human life.

CYTOPLASM :-

STRUCTURE

A semi-solid fluid substance of a cell, exterior to the nuclear membrane and interior to the cellular membrane.

Cytoplasm comprises of :

- cytosol
- organelles
- cytoskeleton

Date:

Cytosol

The fluid mixture of ions, nutrients, enzymes and other essential substances.

Organelles

Organelles are the specialized structures such as ribosomes, endoplasmic reticulum, mitochondria.

Cytoskeleton

The network of proteinacous filaments involved in providing the structural support.

FUNCTIONS

1. Storage System

It serves as the resorvoir for nutrient rich molecules like glycogens and lipids.

2. Intracellular Transport

Cytoplasm serves as the meduim for transport of organelles, nutrients and wastes.

3. Support System

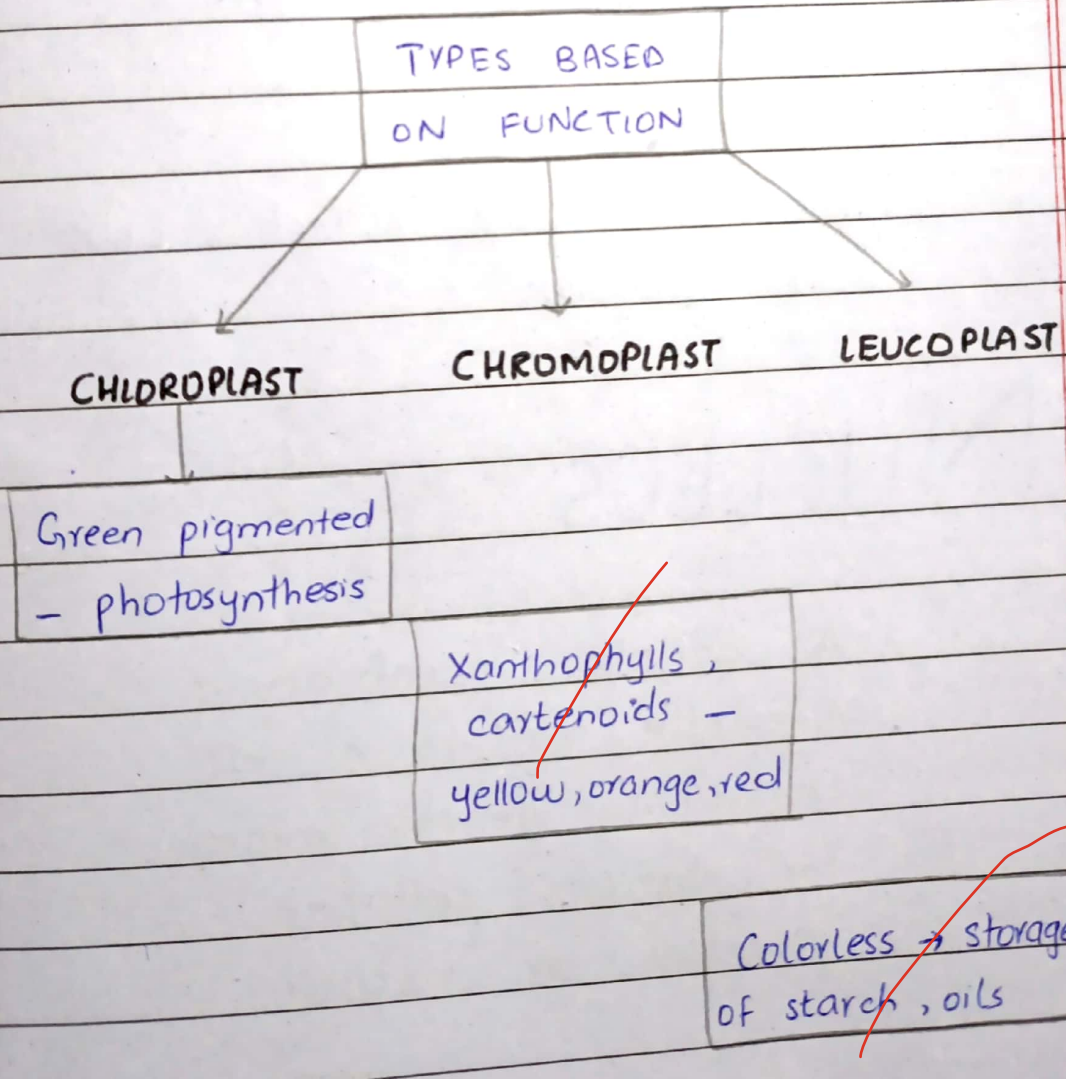
Presence of cytoskeleton maintains the structure and support other organelles.

4. **Biochemical Reactions**

The cytoplasm is the site for various enzymatic activities responsible for metabolism.

PLASTIDS

Plastids are double-membranous organelles found in plant cell for nutrition and manufacturing of food.



FUNCTIONS

1. **Photosynthesis**

Chromoplast have green pigment responsible to break solar energy into chemical.

2. **Energy Production**

Plastids are involved in energy production required for various metabolic activities.

3. **Pigmentation**

Pigmentation aid in pollination and dispersal of seeds.

4. **Storage**

Leucoplasts store starch, oils and proteins

NUCLEUS

A double membranous organelle within a cell containing genetic material for various cellular processes or activities.

The complex structure of nucleus comprises of:

Nuclear Envelope

Double membraned separating nucleus from cytoplasm for exchange

Nucleoplasm

The gel-like substance, with nucleoli and chromatin

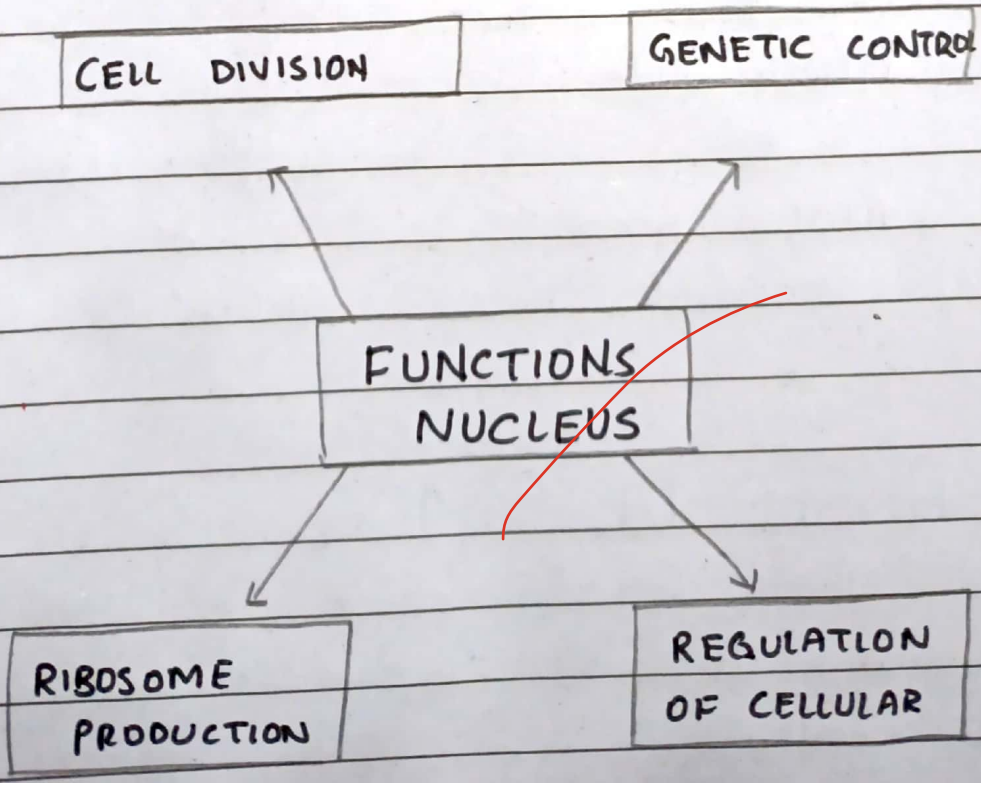
Chromatin

Mixture of proteins and DNA condensing into chromosomes

Nucleolus

A dense region responsible for ribosome synthesis

FUNCTIONS



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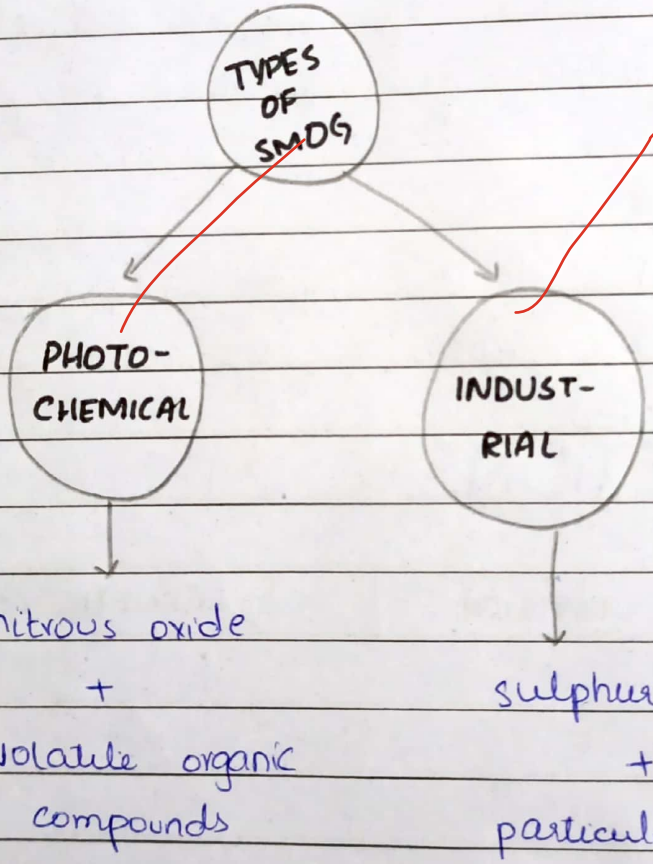
SMOG :

Smog is an environmental issue formed by the combination of fog and smoke. It is the product of gradual accumulation of pollutants from the atmosphere.



CAUSES OF SMOG

The various causes of this environmental air pollution are as follows:

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1. **Combustion of Fossil Fuels**

The burning of coal, oil and gas releases hazardous greenhouse gases.

2. **Deforestation**

The reduction of trees causes excessive amount of poor pollutants – avoiding natural air

3. **Urbanization**

The increase in population results in competition for food and shelter

4. **Lack of Monitoring**

Ineffective and insufficient environmental policies to look at poor air quality index.

5. **Emission of Pollutants**

Emission of compounds like SO_2, NO_x from industries and burning of crop, animal waste releases haarmful gases and particulate matter into the atmosphere.

4

PREVENTION

1. **Urban planning and green infrastructure**

   Developing green belts and planting more trees on clear barren lands

2. **Sustainable Agricultural practices**

   Ban and punishment on open burning of residue and fossil fuel.

   By promoting agricultural friendly tools in farming.

3. **Industrial Emission Control**

   Installing systems like filters, scrubbers and electrostatic precipitators.

4. **Technology and Innovation**

   Promoting renewable energy resources and carbon capture storage technologies.

5. **Vehicles Control and lifestyle**

   Use carpooling system and public transport, preferring walk. Also by using energy efficient appliances.

QNO : 01

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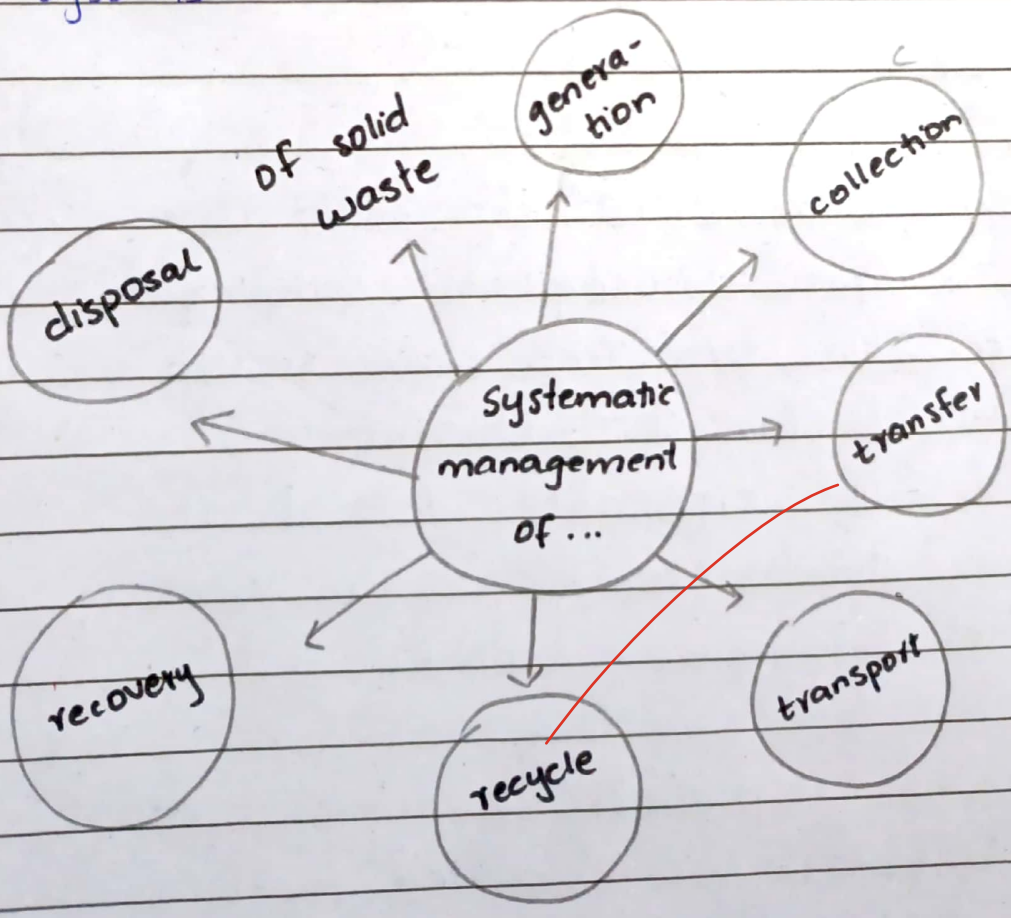
SOLID WASTE MANAGEMENT

DEFINITION OF SOLID WASTE

Solid waste is any residue or waste material produced from domestic, commercial or industrial processes including agricultural operations or water transplant systems.



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WEAKNESSES OF SWM IN PAKISTAN

According to the World Bank :

> The current global municipal solid waste generation levels are 1·3 billion tonns/year and are expected to increase to 2·2 billion tons/year by year 2025.

The multiple factors that leads to the inefficiency and weaknesses in SWM particular in Palistan are as follows :

i. Increase of household size
ii. Open burning and dumping
iii. No scientific SWM system
iv. Unplanned urbanization
v. No appropriate disposal site
vi. Inadequate human resources
vii. Unengineered landfillings
ix. Poor sanitary system
x. Inappropriate plannings
xi. Error in weighing waste management system

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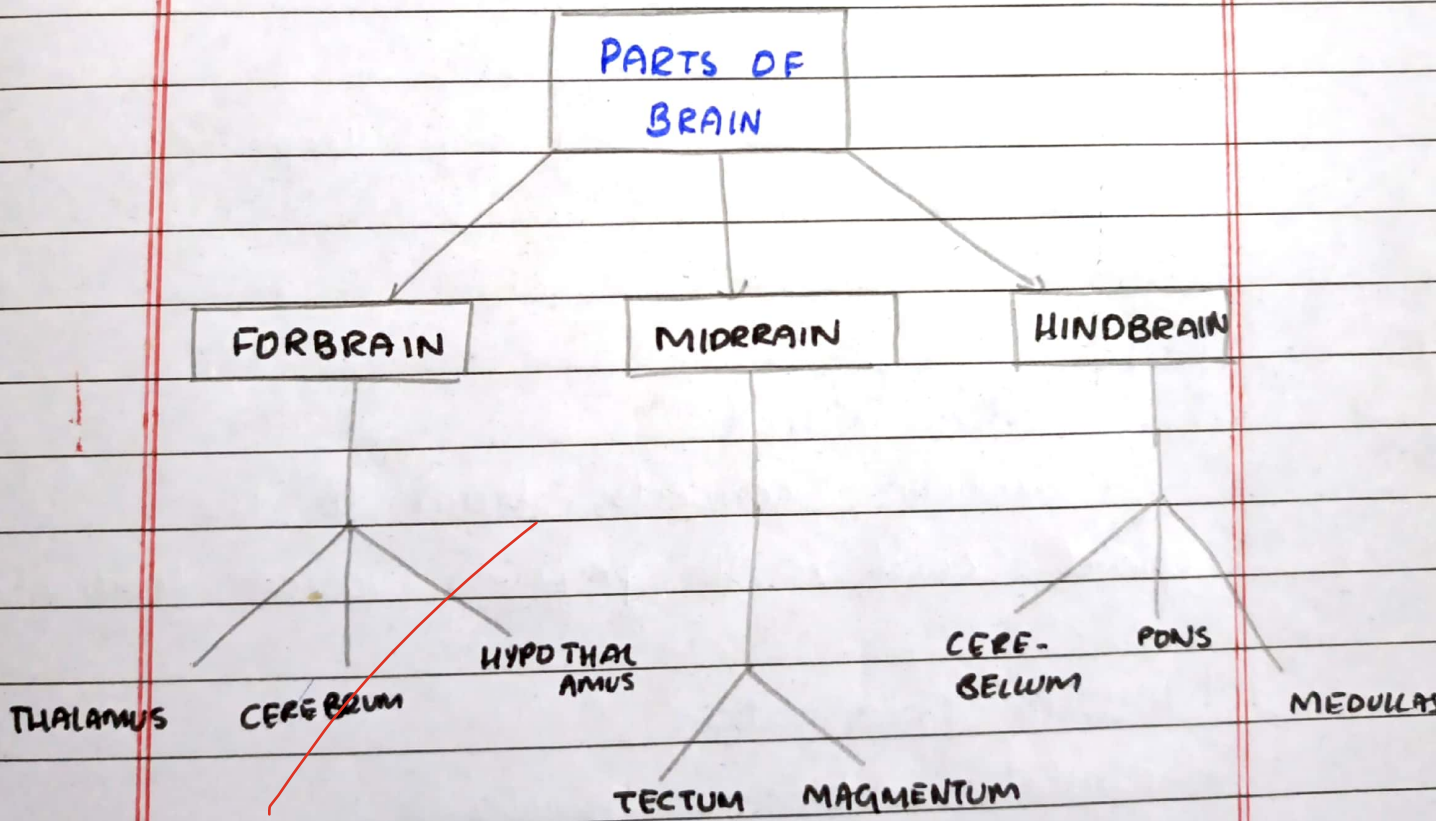
QUESTION - 02

HUMAN BRAIN

The vital organs of human body functioning are brain, kidney, liver, heart and lungs.

STRUCTURE

Human brain comprises of three parts:



FOREBRAIN:

The largest and complex part of brain for high-order functioning.

Cerebrum

- cognition and thinking
- regulating emotions
- motor control
- learning and sensory processing

Thalamus

- role in consciousness
- relay center for sensory information

Hypothalamus

- maintains homeostasis
- controls endocrine system
- regulate hunger, body temp, sleep cycle

HINDBRAIN

Hindbrain connects brain to the spinal cord. It performs various functions.

Medulla Oblongata

- regulates autonomic functions
- control reflex actions

Pons

- regulate sleep cycle
- act as communication bridge

Cerebellum

- coordinates voluntary movements
- maintains body posture

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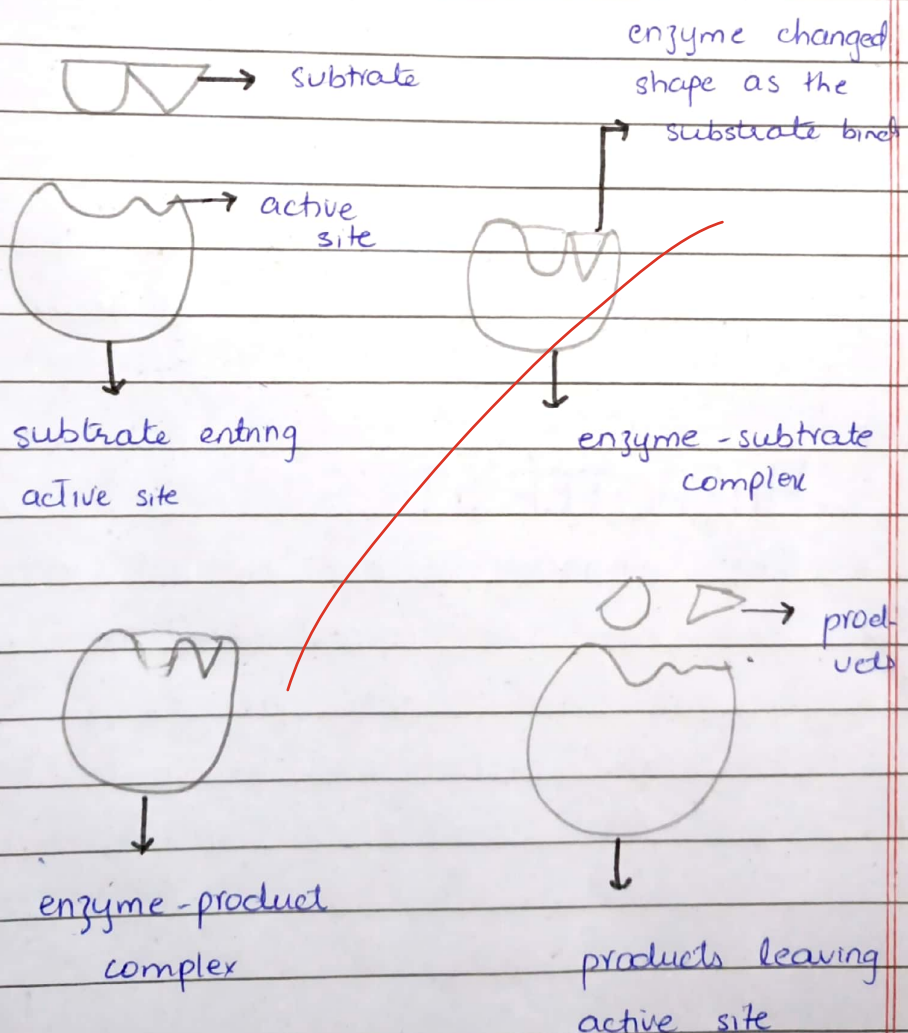
QNO - 02
B

ENZYMES

Enzymes are biological catalyst that speed up the chemical reactions without being consumed.

MECHANISM



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1. Substrate Binding

Enzymes binds to active site forming enz-sub complex. It is highly specific.

- lock and key model
- induced fit model

2. Catalysis

After binding, enzymes lower the activation energy by stabilizing transitional state

3. Product

The reaction occurs and convert substrate into products.

4. Release

Then enzyme is released the product and remains as new.

CHARACTERISTICS

- They enhance reaction by $10^6 - 10^{12}$
- They can be reused; not consumed
- Enzymes are highly specific
- They are proteinacous in nature
- They are sensitive to pH, temprature

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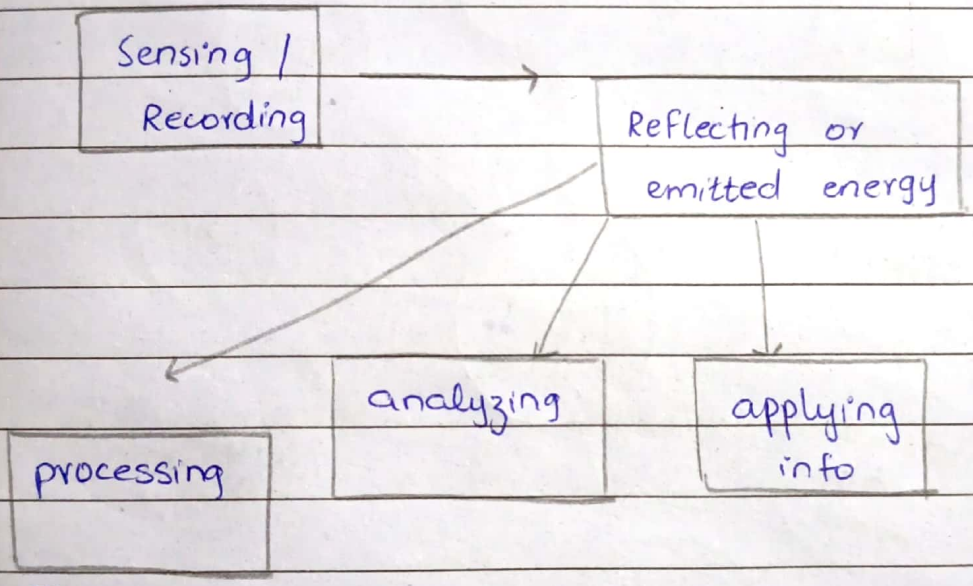
REMOTE SENSING

According to India's National Remote Sensing Agency :

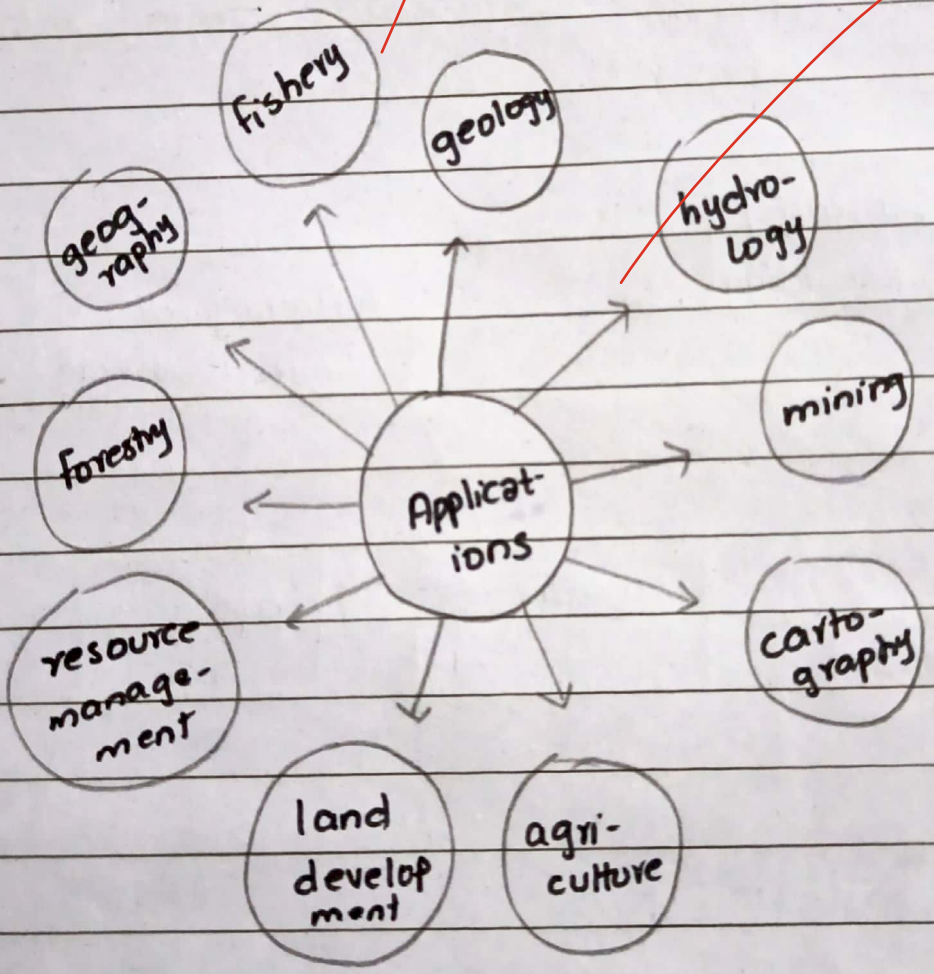
Remote sensing is technique of acquiring information about objects on the earth's surface without physically coming into contact with them.



PRINCIPLES

Sun provides electromagnetic radiation that interacts with Earth's surface. As it travels through the atmosphere, it interacts with gases, aerosols and clouds that can alter its intensity and wavelength. When energy reaches the surface, it is either absorbed, transmitted or reflected.

The sensors measure the reflected energy in specific wavelengths. And the desired or collected data is then transmitted to ground station to provide images, which then extract information about the target. Then, it is applied to assist in decision making for particular problem.



APPLICATIONS

1. Urban Planning

Remote sensing helps in planning pipeline routes, ring roads and mass transit systems.

surface to know the status of biodiversity.

3. Land Mapping

Remote sensing used for updated land use pattern, occuring from time to time.

4. Disaster Assessment

RS. techniques have been found to be highly affective in the disaster damage assessment.

5. Coastal Zones

It is useful to provide data on such zones along with monitoring of environmental degradation.

3.5

QNO - 2

D.

RENEWABLE ENERGY :

The energy sources that are obtained from human resources which are replenishable with human time are called renewable energy resources. They include ; solar wind energy.

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REDUCING COST

Transitioning to renewable energy resources is essential to address environmental challenge.

1. Conservation of Natural Resources

Renewable energy systems depend on non-exhaustible resources like sunlight, wind reducing damage of natural resources.

2. Reduction in Greenhouse Emissions

Renewable sources less emissions that aid in combating climate change reducing CO_2 and CH_4 levels.

3. Waste Management

Fossil fuel combustion produces harmful wastes that can be reduced by renewable technologies.

4. Reduction in Land Degradation

Installation of systems like solar panel and offshore wind farms, leave little land foot-print preventing natural aura.