

Paper: General Science & Abilities

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PART-II (SECTION-A)

QUESTION NO. 4

b) What is cyclone? Describe the formation of cyclone.

Cyclone is a large air mass that rotates around a strong center of low atmospheric pressure, counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Cyclones are characterized by very low air pressure, strong winds, heavy rainfall, and organized circulation around a central core.

A. Types of cyclone:

According to the region of their formation, cyclones have been categorized in two types.

i) Tropical Cyclone

This type of cyclone

is formed over warm waters ocean. Depending on the regions tropical cyclones are known by different names.

a) Hurricanes

Hurricanes are formed over Atlantic and Northeast Pacific oceans.

b) Typhoons

Typhoon are formed over Northwest Pacific ocean.

c) Cyclones

Cyclones, in general, are formed over Indian Ocean and South Pacific ocean.

ii) Temperate Cyclones

Temperate cyclone is large scale low pressure weather system that develops in the Middle latitudes. Unlike tropical cyclones, temperate cyclones are formed over away from the warm oceans.

B. Formation of Cyclones:

Cyclones are formed under specific atmospheric conditions.

In the case of tropical cyclones, following conditions are necessary.

i) Warm ocean water

Sea surface temperature must

be around $26-27^{\circ}\text{C}$. Warm water provide heat and moisture to fuel the storm.

ii) Low atmospheric pressure

Preexisting low-pressure disturbance (such a tropical wave) allow air to converge and rise, initiating storm development.

iii) Coriolis Force:

Earth's rotation causes air to deflect, producing a spiral motion.

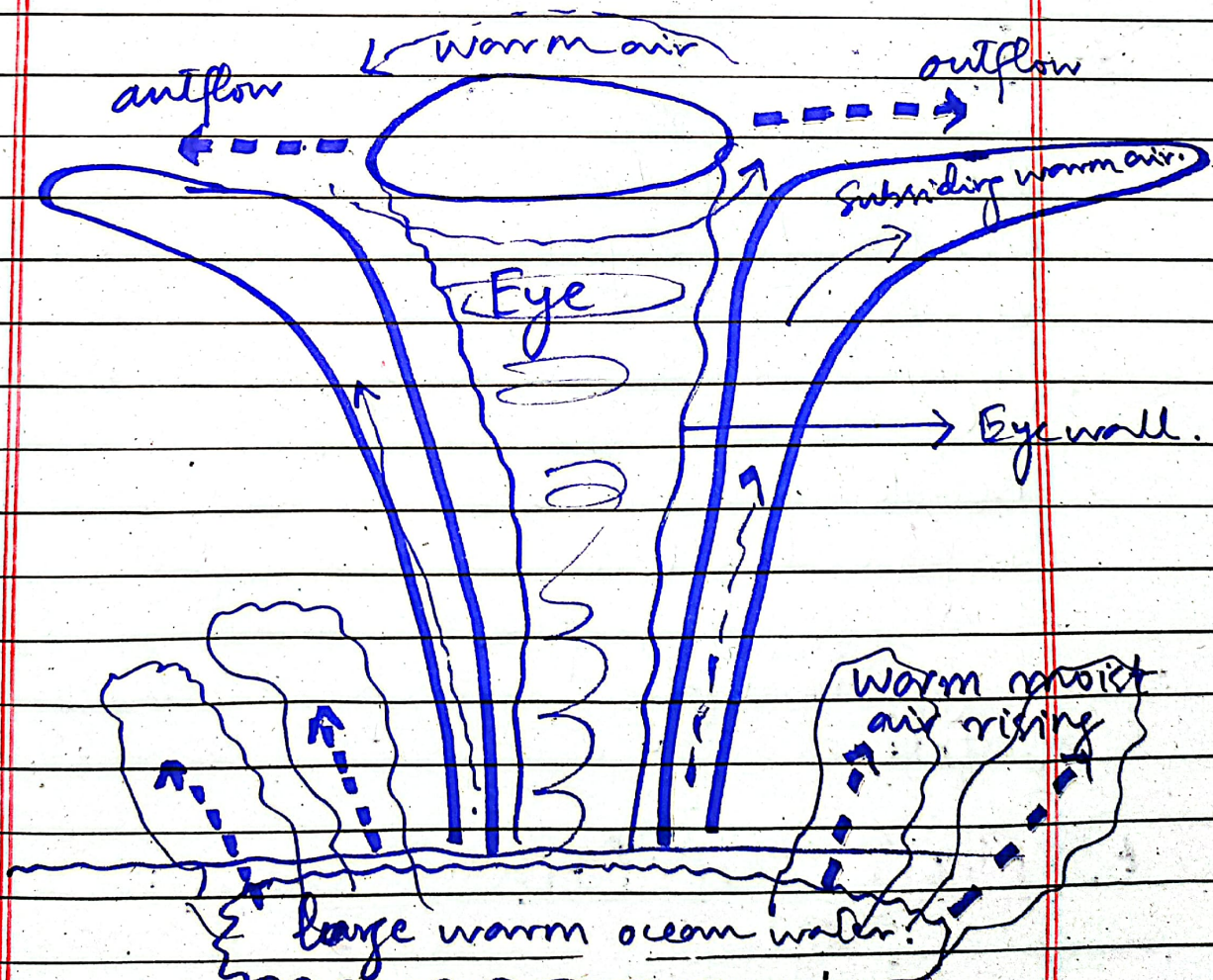


Fig: Structure of Cyclone

iv) High humidity and atmospheric instability:

Moist air in the lower and middle troposphere supports cloud growth and sustained convection.

v) low vertical wind shear:

Minimal difference in wind speed and direction with height allows the storm to grow vertically.



d) How remote sensing can be employed for environmental purposes?

A Remote Sensing:

Remote sensing is the acquisition of information about an object, phenomenon or an area without making physical contact with it.

Remote sensing uses multiple components to gather data about a geographical area of earth remotely, which includes satellite sensor, earth station, etc.

B. Process of Remote Sensing:

a) Sunlight strikes land

The process of remote sensing

starts as sunlight reaches the Earth and is reflected back into the atmosphere after absorption.

b) The reflected energy is intercepted by remote sensing satellite in the earth's atmosphere and collects the data.

c) Data shared with ground station

After the data has been intercepted and gathered by the satellite, it is shared with the ground station for further analysis and study of a remote area.

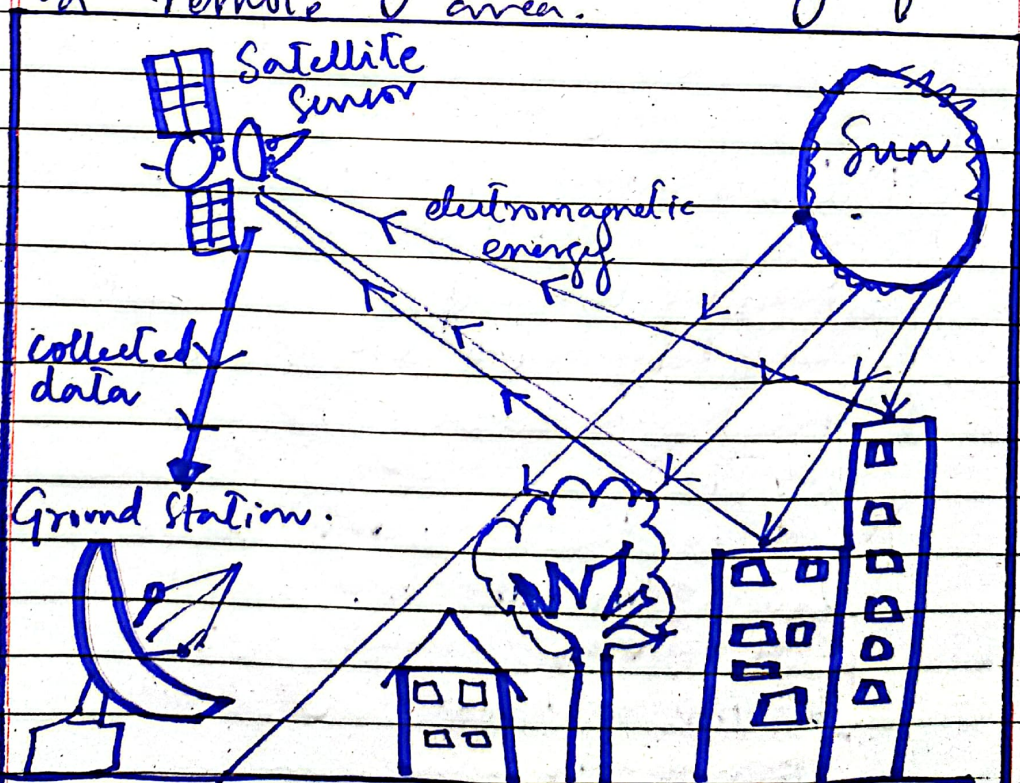


Fig: Remote Sensing

C. Employment of Remote Sensing for Environment Purposes.

Remote sensing plays a great role in environment monitoring by allowing information gathering without requiring to physically visit the area. Remote sensing can be employed for multiple environmental purposes.

a) Climate and atmosphere:

Remote sensing helps in studying climate change and the concentration of gases in the upper atmosphere and temperature variations taking place on a regular basis.

b) Land use and forestry:

Remote sensing can help in monitoring the changes in land and forest cover on earth. It can help to provide spatial view of expanding urbanization and deforestation.

c) Water resources:

Remote sensing can also help in assessing water quality.

Date: _____

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Temperature of water bodies like oceans, rivers, and lakes. Moreover, it can help by providing data on changing river courses and floodplain situations.

d) Disaster management:

Another application of remote sensing for environment purposes can be better disaster management. It can provide crucial information during about affected regions during floods, earthquakes, wildfires and volcanic eruptions, enabling a better emergency response.

e) Agriculture:

Remote sensing can help to innovate agriculture sector by studying impact of changing climate on crops. It allows crucial decision making regarding crop cultivation and other agriculture related issues.

c) Enlist the functions of:

i) Carbohydrates

Carbohydrates are essential macromolecules that provide a major source of energy to body for proper functioning. Carbohydrates are readily found in grains, vegetables, fruits and dairy products, and contain sugar, starch and fiber.

• functions:

a) Energy Source:

Carbohydrates are the primary source of energy for body. Body converts carbohydrates into glucose for immediate use.

b) Energy Storage:

Carbohydrates, after getting converted into glucose are stored as glycogen in the liver and muscles for future energy needs.

c) Essential for health:

Plays vital role in metabolism, blood glucose regulation and cholesterol management.

ii) Protiens:

Protein is a major macro-nutrient, a large molecule made of long chain of amino acid. ~~chain~~ Proteins are found in foods like meat, dairy, nuts etc.

● Functions:

a) Muscle building and repair:

- Proteins play a vital role in the building of tissues and muscles in the body.
- Also play crucial role in the repairing of damaged muscles.

b) Enzymes and hormones:

- Protein are essential for creating enzymes that drive metabolic reactions and hormones that regulate body.

c) Immunity:

Proteins form antibodies that fight infections and illness, helping the body to recover.

iii) Fats:

Fats are essential nutrients for body. They are found in foods like oils, nuts, dairy, and meats.

• Functions:

a) Energy and storage:

Fats are dense energy source and are stored for later use.

b) Nutrient absorption:

Fats play an inevitable role in the absorption of essential nutrients vitamins A, E, D, K.

c) Cell and Organ Health:

Fats are important for the development of cell membranes, nerve tissues, hormones, cushion organs, and provide insulation.

iv) Iron:

Iron is a crucial mineral that is essential for multiple body functions. Its sources are red meat, leafy greens, beans, and fortified minerals besides others.

• Function:

a) Oxygen transport:

The primary role of iron is to form hemoglobin, which carries oxygen from lungs to cells.

b) Immunity:

Iron is also essential for immunity in the body against infections.

c) Growth and development:

Iron is also essential for normal body growth, brain development, especially in children, and hormone production.

d) Body structure:

Iron is essential to healthy skin, nail, and hair.

v) Calcium:

Calcium is a vital mineral that is important for human body. Its main sources are milk, leafy greens, fortified foods and fish with bones.

• Functions:

a) Bone and teeth health
Calcium is important for
hard structure of bone
and teeth.

b) Muscle function:
Regulates muscle contraction
and relaxation, including the heart muscle.

c) Blood clotting:
Calcium also plays a
crucial role in the
blood clotting.

d) Prevents Osteoporosis:
Adequate intake of calcium
throughout the life helps
in preventing brittle bones.