

Q. No. 2

- a. Briefly explain lipids. What are some major types? What are their functions?

Lipids are diverse group of hydrophobic or amphipathic molecules primarily composed of carbon, hydrogen and oxygen. They are insoluble in water but soluble in non-polar solvents. Lipids play vital roles in biological systems, including energy storage, cell membrane structure and signaling.

Major types of lipids:

- a) Fats and oils (Triglycerides):

These are composed of glycerol and three fatty acids. The primary function of these the long-term of energy storage.

**b. Phospholipids:**

These are the cholesterol that make biological membrane.

**c) Steroids:**

It include cholesterol and hormones like estrogen and testosterone. It plays role in membrane fluidity and signaling.

**d) Waxes.**

Long-chain fatty acids esterified to long chain-alcohols, provides protecting coating in plants and animals.

**Function of lipids:**

**Energy storage:** Lipids store more energy per gram than carbohydrates.

**Structural Component:**

Phospholipids form the structural framework of cell membranes.

**Waterproofing:** Waxes prevent water loss in plants and animals.

DATE: \_\_\_\_\_

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## Insulation and Protection:

Fats provide thermal insulation and cushion organs.

## Part (d)

Enlist Discuss nervous system of the human body:

The human nervous system is highly organized network that controls body functions and responses. It is divided into two:

- i) CNS
- ii) PNS.

### i) Central Nervous System:

It includes the brain and spinal cord. The brain processes the sensory information and coordinates actions, while the spinal cord transmits signals between the brain and body and controls reflexes.

### ii) Peripheral Nervous system:

It consists of nerves branching from the CNS. It is further divided into:

a) **Somatic Nervous system:**

It controls voluntary movements.

b) **Autonomic Nervous system:**

It manages involuntary functions like heart rate and digestion.

It has two subdivisions.

a) **Sympathetic System:**

It activates "fight or flight"

b) **Parasympathetic System:**

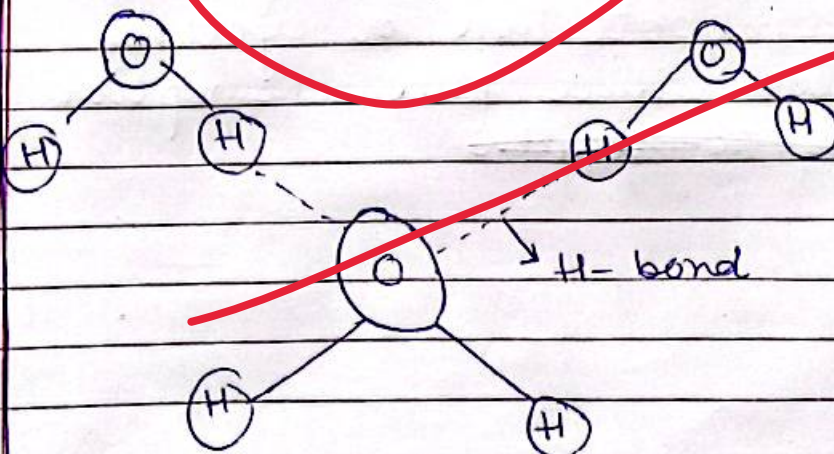
It promotes, & rest and digestion.

**Functions:**

Main function of human body's nervous system is to send messages from various parts of ~~the~~ the body to brain, and from brain back to the body to tell what to do.

c) What is hydrogen bonding.  
Give? Give Elaborate  
Structure as an example.

Hydrogen bonding is a special type of dipole-dipole attraction between molecules, not a covalent bond to a hydrogen atom. It results from the attractive force between a hydrogen atom covalently bonded to a very <sup>electro</sup>negative electronegative atom such as Nitrogen (N), Oxygen (O), or <sup>(Fluorine)</sup>F atom and another very electronegative atom.



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- b) Enlist a few measures for energy conservation and its sustainable use.

**What is energy conservation?**

The prevention of the wasteful use of energy especially in order to ensure its continuing availability. It is the decision and practice of using less energy.

**Measures for energy conservation:**

- 1) **Renewable Energy Sources:**

Promote the use of solar, wind and hydroelectric power to reduce dependence on fossil fuels.

- 2) **Public Transport:**

Encourage the use of public transportation or cycling to reduce fuel consumption.

**Explain complex concepts in simple terms.**

**Include diagrams and flowcharts for competitive edge.**

**Discuss practical applications of scientific concepts.**

**Use diagrams and graphs**