

Part-II Section-1

Question-2

A-

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

Lipids:

It is derived from the word "Lipos" means fat building blocks of lipids, are fatty acid, Glycerol and steroids.

Characteristics of Lipids

Characteristics of lipids are given below:

- 1- They are the most heterogenous group of substances.
- 2- Insoluble in water and soluble in organic compounds like ether, alcohol, Chloroform, Benzene etc.
- 3- Poor conductors of heat and electricity.
- 4- Fats, oils and steroids are the most important lipids.
- 5- Lipids are used as raw material in the manufacturing of Soap, detergents, Varnishes, Paints, Polishes, Cosmetics and Pharmaceuticals.
- 6- Good source of energy and reservoirs in our body.
- 7- Integral part of Protoplasm and Cell.

Major types of Lipids

Simple Lipids Compound Derived

Types and their Functions

1- Simple Lipids:

Simple Lipids are compounds of fatty acids with glycerol.

e.g:

Common fats and oils.

2- Compound Lipids

Compound lipids are compound of fatty acids with glycerol and possess additional groups.

e.g:

Phospholipids (Phosphoric acids),
Glycolipids (carbohydrates) and
Lipo protein.

3- Derived Lipids:

Derived lipids are those substances derived from simple and compound lipids by hydrolysis.

e.g:

Sterols, vitamins and Terpenoids.

Question-2 (B)

Enlist the few measures of energy conservation and its sustainable use?

Measures of Energy Conservation:

1- Switch to LED Lightening

LED bulbs consume less energy than the traditional incandescent bulbs.

2- Use of energy-efficient appliances:

Use appliances with star label energy which indicates they

meet energy efficiency standards.

3- Insulate buildings and homes:

Proper insulation can reduce heat loss in the winter and heat gain in the summer and temperature maintained.

4- Use Power strips:

Plug the electronics such as TV and Computer into power strips and turn off not eliminate stand by power ^{loss} consumption.

5- Use Energy Monitoring Tools:

Use tools like thermostats and energy monitors to track your energy and identify areas for improvement.

6- Turn off Appliances when not in use:

Habit can bring a big difference in the energy conservation.

7- Use Sustainable energy resources:

Wind energy and Solar Panel energy are sustainable energy resources.

Usage of Conservation energy:

Diagram Chart

	<u>Conservation Source</u>	<u>%</u>	<u>Usage</u>	<u>Source Refs</u>
1-	Switch to LED lighting	75-90%	Industries, Govt Departments and also can export.	US Department of energy
2-	Energy efficient appliances	10-50%	Home Usage Industries	Energy Star
3-	Insulate buildings and homes.	20-50%	Home Usage Government Departments	US Energy Department
4-	Use Power Strips	5-10%	Home Usage	US Energy Department
5-	Energy monitoring Tools.	5-15%	Home Usage	US Energy Department
6-	Turn off appliances and lights not in Use.	10-20%	Govt Department Home Usage	US Energy Department

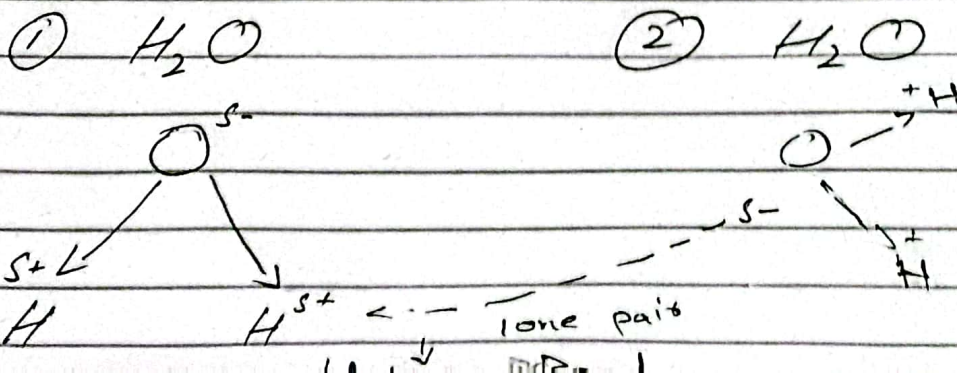
Question-2 (C)

What is hydrogen bonding?
Give elaborating structure as example.

Explanation of Hydrogen Bonding:

Hydrogen bond is an inter-molecular bond formed between the hydrogen atom of one molecule and the most electronegative atom of an other molecule. During the bond there is force of attraction which is called **dipole-dipole interaction**. It is very important in the proteins and nucleic acids. The "**Unzipping**" of DNA is a breaking of hydrogen bonds which helps to hold the two strands of double helix together.

Elaborating Structure as Example

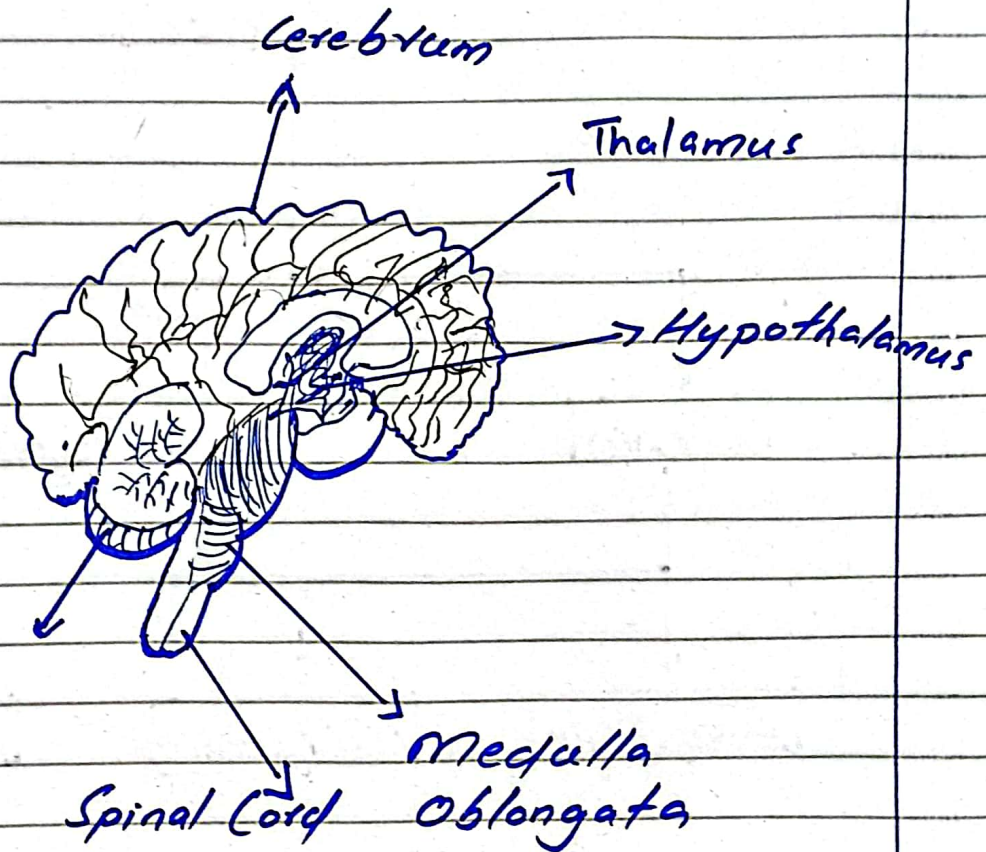


Hydrogen Bond in Water as example:

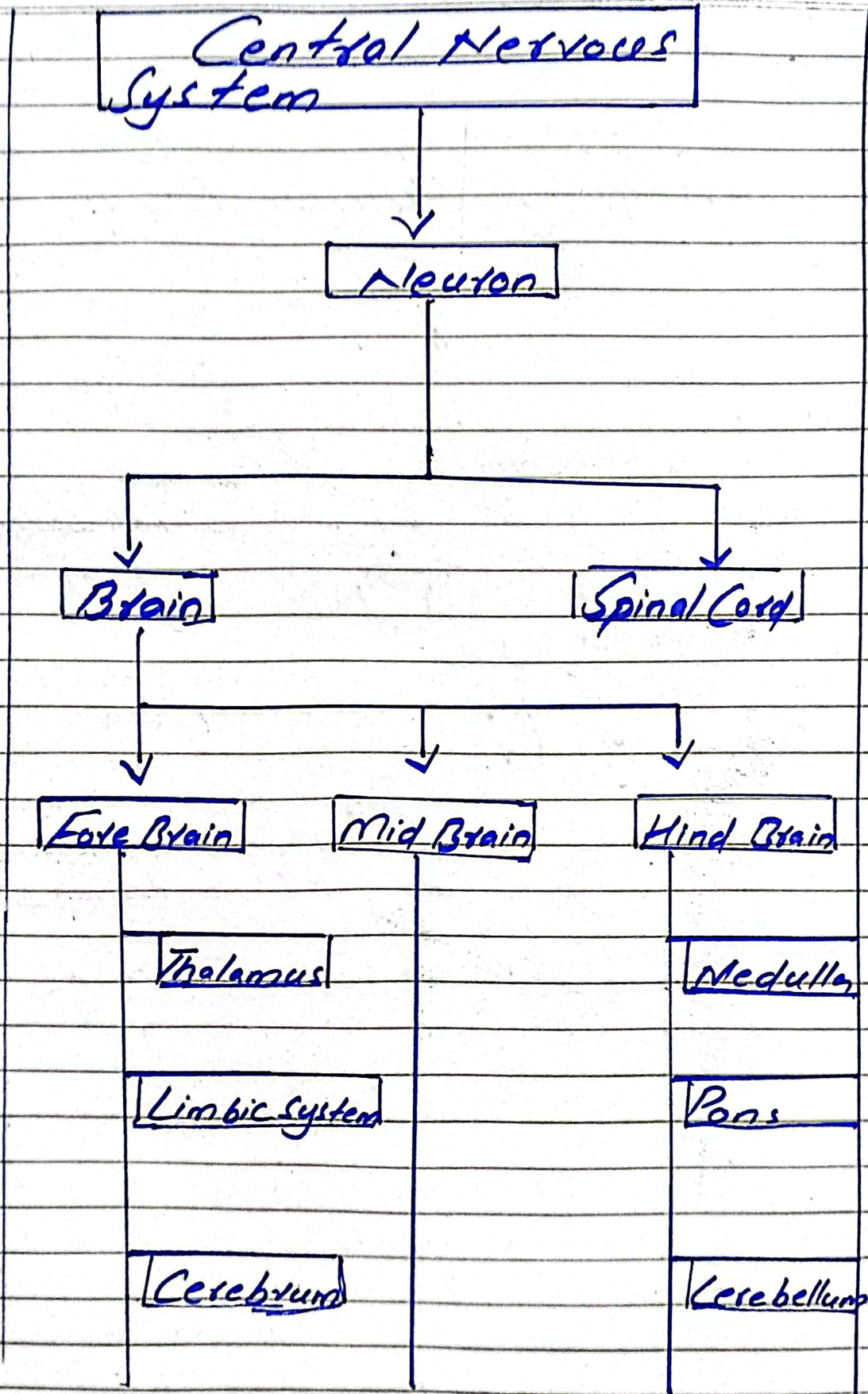
H_2O (water molecule) can form four Hydrogen because it has eight number of positive hydrogen and lone pairs so that every one them (as mentioned in given structure) involved in the Hydrogen bonding.

Question-2 (D)

Discuss the Nervous System of Human Body:



Structure of Brain of Human:



1- Neuron:

Structural and Functional unit of nervous system consists of brain and Spinal Cord.

2- Brain:

Protected by the hard bone called Cranium, a layer called meninges and Cerebrospinal fluid, divided into three parts Forebrain, Midbrain and Hindbrain.

3- Forebrain:

divided into three Parts
Thalamus, limbic System and
Cerebrum.

i- Thalamus:

Transfers the Sensory information to limbic System. Sensory information includes auditory and Visual.

ii- Limbic System

further divided into three Parts.

a- Hypothalamus: controls body temperature, hunger, menstrual cycle, water balance and sleep-wake cycle.

6. **Amygdala:** produces sensation for pleasure, punishment, sexual arousal and feelings of fear and rage.

7. **Hypocomplex:** Controls long term memory.

4. Mid Brain:

Connects the forebrain with hindbrain, contains reticular formation important for screening input information, relay center for auditory information and also controls reflex movements of eye.

5. Hind Brain:

Consists of three parts, medulla, Pons and Cerebellum.

i- **Medulla:** Controls breathing, heart rate, blood pressure and swallowing.

ii- **Pons:** Controls transitions b/w sleep and wakefulness.

iii- **Cerebellum:** important in coordinating movements and maintaining position of the body also involved in the learning and memory storage.

6- Spinal Cord:

Medulla Oblongata narrows down into an oval shaped hollow cylinder, running through vertebral column called Spinal Cord. Shaped like a butterfly with grey matter containing Central Canal. It serves as pathway between different parts of the body and brain. 31 pairs of nerve originate from spinal cord called Spinal nerves. and 12 pairs originate from the brain called Cerebral or Cranial nerves.

Question-4 (A)

What is Hepatitis? Explain its Causes, Symptoms and Preventions.

What is Hepatitis?

The condition in which inflammation of liver caused by virus, bacterial infection or continuous exposure to alcohol, drugs or toxic chemicals found in aerosol sprays and paints is called Hepatitis.

Causes of Hepatitis:

Some causes are given below:

1- Viral Hepatitis: A, B, C, D and E.

2- Bacterial Infectious Hepatitis: Bacteria like E. coli and Salmonella.

3- Parasitic: Parasites like Plasmodium falciparum and Toxoplasma gondii.

4- Alcohol Consumption: Excessive alcohol causes hepatitis.

5- Toxins and chemicals: Carbon Tetrachloride, vinyl chloride cause hepatitis.

6- Genetic Disorder: Genetic disorders like Wilson's disease and alpha-1 antitrypsin deficiency.

Symptoms of Hepatitis:

following are the symptoms of hepatitis:

- 1- General Weakness and fatigue.
- 2- loss of Appetite
- 3- Fever
- 4- Abdominal Pain.
- 5- Tenderness
- 6- Jaundice.
- 7- Yellowing of skin and eyes
- 8- Yellow color occurs when liver fails to break down excess yellow color bile pigment.

Preventions of Hepatitis:

following are the preventions of hepatitis:

- 1- Vaccines are available to prevent hepatitis A and B and immune globulin also prevents from hepatitis A and B if they are given within exposure of two weeks.

2- No vaccines are available to prevent from the infection of HCV, HEV and HIV.

3- Best protection against the viruses is to avoid high risk activities like not use the used needles, syringes and Razors.

Question-4 (B)

Elaborate a few methods of food preservation.

Introduction to the Concept Food Preservation

Food is Preserve by the Preservatives which are substances or chemicals added to food, beverages, Pharmaceutical drugs, biological Samples, Cosmetics to prevent decomposition by microbial growth.

Types of Preservatives by which food is preserved:

1- Natural food Preservatives:

Natural food preservatives or we may also called them Tradition food preservatives like Salt, Sugar, alcohol, vinegar etc. And also food is preserved through boiling, freezing and salting.

2- Chemical Food preservatives

Used now a days and seems to be best and most effective for longer shelf life of food.

e.g

- 1- Benzoates = Sodium benzoate and benzoic acid.
- 2- Nitrates = Sodium nitrate
- 3- Sulphites = Sulphur dioxide
- 4- Sorbates = Sodium sorbate and potassium sorbate.

3- Artificial preservatives:

Artificial preservatives are the chemical substances that delayed the growth of bacteria, spoilage and its discolorization.

e.g:

- 1- Antimicrobial Agents = Sorbates, Nitrates, Benzoates.
- 2- Antioxidants = Vitamin E, C and Butylated hydroxyl toluene.
- 3- Chelating Agent = Phosphates and Citric Acid.

3- Complete Fertilizer:

Contains all ingredients necessary for the plants growth.

eg: Guano.

4- Incomplete Fertilizers:

Fertilizers that contain one or two needed elements.

eg: Phosphate, Potassium Nitrate.

5- Micro Fertilizers:

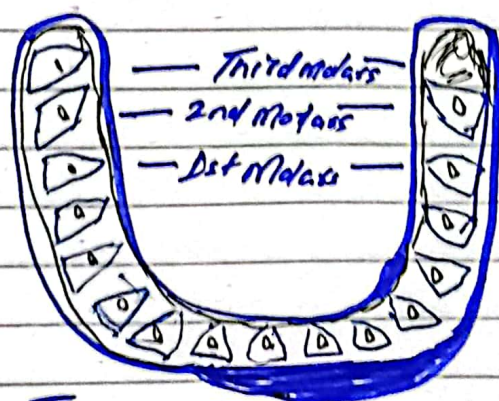
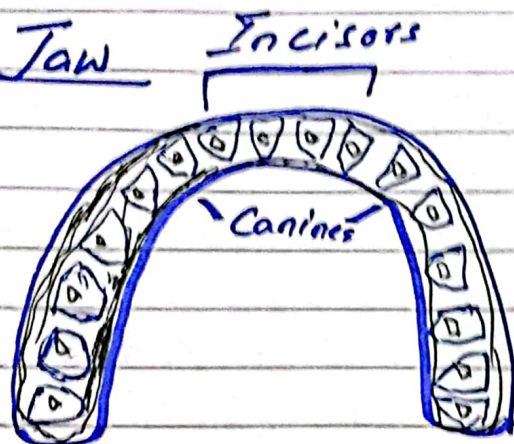
Contains elements which are required in small amount.

eg: Boron, Zinc.

Question - 4 (D)

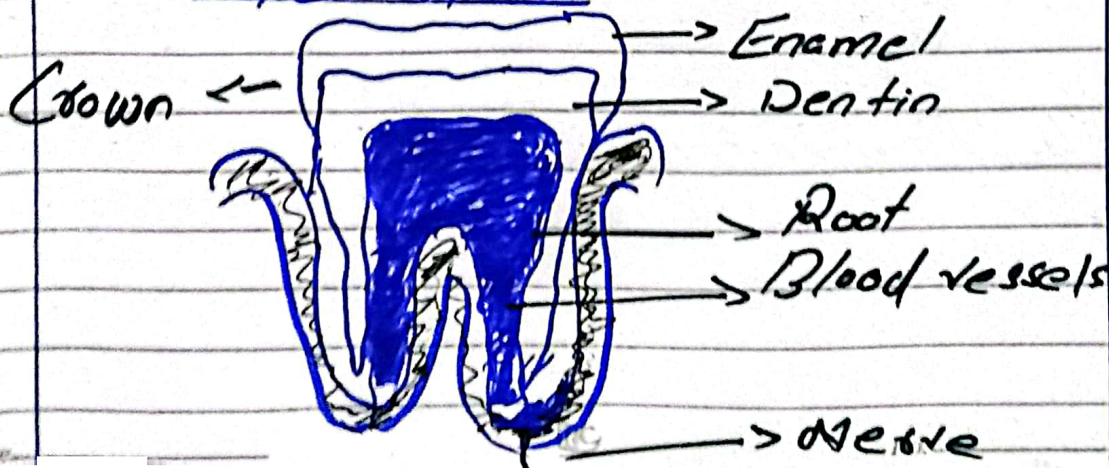
What is the anatomy of human teeth?

Upper Jaw



Lower Jaw

Structure of Human Teeth



Structure of Teeth:

Visible portion of tooth is called crown and portion lies beneath the gum line is root. Human teeth are made of four distinct types of tissues which are mentioned below:

1- Enamel:

outer layer of tooth, hardest substance in the human body. Enamel layer is about 0.16 cm thick which protects the inner layers of the teeth from bacteria and changes in temperature from hot and cold.

2- Dentin:

Beneath enamel is dentin, mineral material, similar to human bone.

3- Pulp:

Cavity beneath the Pulp dentin called Pulp which contains blood vessel. Carry oxygen and nutrients to teeth, nerve transmit pain and temperature sensation to brain.

4- Cementum:

outer layer of tooth that anchors tooth to jawbone.

4- Molar:

Behind the premolars are the molars where most vigorous chewing occurs. There are 12 molars three sets in each jaw referred as First, Second and Third molars. Third molars are often called wisdom teeth.