

Q.2

2

## Lipids.

Lipids are a diverse group of organic molecules that are insoluble in water but soluble in organic nonpolar solvents. These are made up of Carbon, Hydrogen, and Oxygen. Phosphorus and nitrogen are occasionally present. Lipids play a major role in energy preservation and supply to the body. These are important part of the cell membrane.

### Types of Lipids:

There are approximately ~~three~~ types of lipids are present.

#### Triglycerides: (Saturated)

Composed of one glycerol bonded with three fatty acids chain via ester linkage. These are saturated fats at room temperature, & animal fat is one of the example.

#### Phospholipids.

Composed of a glycerol back bone two fatty acid chains and

a phosphate group. They will be saturated or unsaturated in nature have amphipathic nature

## Unsaturated Fats:

Unsaturated fatty acids contain one or more double bonds in their carbon chains, causing kinks that prevent tight packing. These fats are usually liquids at room temperature. They are further classified into monosaturated or and poly saturated having one double bond and contain two or more double bond respectively.

## Trans Fats:

Trans fatty acids are unsaturated fats that have been partially hydrogenated. This process converts some of the naturally occurring cis double bonds into trans double bonds making the fats more saturated solid and stable.

## Functions of Lipids:

### 1) Energy storage:

Triglycerids are the primary energy storage molecules in animals and plants. Lipids provide 9 calories

of energy per gram.  
**Structural roles:**

Cholesterol and phospholipids are integral to cell membranes ensuring structural integrity and flexibility.

**Signaling Molecules:**

Steroids hormones regulate various psychological processes.

**Protection and insulation:**

Adipose tissues cushion organs and prevents physical damage also provide insulation to myelin sheath in neurons.

**Water proofing:**

Waxes protect plant leaves and animal skin by forming water resistant barriers. Insulates the body to maintain optimal temperature, particularly in cold environment.

**vitamin Storage and absorption:**

Lipids facilitate the absorption of fat-soluble vitamins K, E, D, and A. Serve as reservoir for these essential nutrients.

Q.2 (b)

Enlist a few measures of energy conservations.

In this modern and advanced world, where industrialization is the main goal of a country to achieve development and to get money, energy conservation is need of the hour. Energy conservation referred to the process of saving or using energy efficiently to reduce waste and lower the cost and protect environmental resources. Sustainable development is possible only by exploitation of energy resources efficiently.

**Behavioral conservation:**

Behavioral conservation referred to human's acts in energy conservation. Individual should take care of energy by the process of sustain<sup>n</sup> sustainable use. for example, in night one should check all electrical appliances and lights, switch off all unnecessary lights and electrical appliances.

**Technological conservation.**

Technological

conservation means upgrading of electrical appliances and use modern technologies that use <sup>less</sup> electricity than that of the previous. For example use of energy savers or LED lights at the place of bulbs and use of T3 compressors in air conditioners.

### Industrial conservation:

energy use in industries. Use of <sup>optimizing</sup> motors which use less energy and also greased of all machinery parts to prevent resistance from different moving objects. Implementation of energy management system in which installation of cameras to monitor electricity use and making a strategy for sustainable use of energy.

### Renewable Energy utilization:

one should use renewable energy to reserve electricity produced from fuels. Pakistan has <sup>lot</sup> of opportunities regarding renewable energy for example wind energy, solar energy, nuclear energy and hydropower. If individuals and government made strategies

Pakistan can save energy in bulk.

## Transportation Energy Conservation

By transportation conservation we can ~~the~~ reduce energy use for example use of public transport rather than your own vehicle and adopting electric or hybrid vehicles.

## (d) Discuss the nervous system of the body.

The Nervous system is a complex network of cells and tissues that are specialized in this system and control all the functions of the body. It functions through electric signals which are called nerve impulses.

### Parts of Nervous system

Nervous system is based on two parts i Central nervous system and ii peripheral nervous system.

### Central Nervous system

Central nervous system comprised of Brain and spinal cord. It acts as the central system of the body, processing information and issue commands to the external

organs. Brain controls cognitive functions, memory, emotions, and voluntary actions. Coordinates involuntary function like heart rate and breathing and eye cover working. Spinal cord play a role between the brain and rest of the body, for example if you ~~feet~~ are touched with an electrical wire and received a electric shock, it is the spinal cord who orders you to leave the hand wire immediately. This process is done only in 8th part of a second.

## ~~Part~~ Peripheral Nervous system.

It is comprised of nerves which receives and delivers the message from brain to the rest of the body. In a human body at every place of skin there is a nerve which receives nerve impulses. This part is further divided into i) Somatic Nervous system and ii) Autonomic nervous system.

Somatic nerves are those who ~~received~~ which control voluntary action by transmitting signals from central nervous system.

Also relays sensory information from skin, muscles and joints to the CNS.

While autonomic nervous system deals with regulatory involuntary actions like heart beats, digestion, and breathing.

It is further divided into sympathetic and parasympathic nervous system which prepares the body for fight or flight and promote rest and digestion activities respectively.

### Types of Nerves:

i Sensory nerves

ii motor nerves

iii mixed nerves.

### Cells of Nervous System:

i Neuron

ii Glial cells.

Neuron further comprised of Soma, dendrites, axon and synapse.

Glial cells, support and protect neurons types.

Q.4

### Hepatitis:

Hepatitis is a medical condition characterized by the inflammation of the liver. In this disease liver

do not work properly and stops blood formation and decrease the production of bile juice which is used to digest the foods.

## Causes:

It has various causes including viral infections, excessive alcohol consumption, autoimmune diseases, medication, toxins and use of medical equipment which is already used in the surgery of hepatitis patient without proper sterilization.

## Types of Hepatitis.

Hepatitis is broadly classified as viral and non-viral hepatitis.

### Viral Hepatitis:

- i Hepatitis A
- ii Hepatitis B
- iii Hepatitis C
- iv Hepatitis D
- v Hepatitis E

### Non Viral Hepatitis.

- i Alcoholic
- ii Autoimmune
- iii Drug Induced
- iv Fatty Liver

## Symptoms:

Symptoms are further classified into Early and later symptoms of hepatitis.

## Early Symptoms

- i Fatigue
- ii Loss of appetite
- iii Nausea & vomiting
- iv Low grad fever
- v muscle & joint pain

## Later Symptoms:

- i Jaundice
- ii Dark urine
- iii Pale stools
- iv Abdominal pain
- v Swollen Abdomin

## Prevention of Hepatitis:

- i Vaccination
- ii Hygiene
- iii Safe practices
- iv Moderation in Alcohol consumption
- v Regular Health checkup.

Q.4 (b)

## Food Preservation.

Food preservation referred to the process by which people keep their food safe from damage and save it for a long time. Food preservation is us a very old technique. People in pre industrial and in asitic phase use different methods to preserve foods from contamination of any type of germs or any other foreign body.

# Methods of Food Preservation,

Food preservation methods are further classified into old and advance preservation methods.

## Old Methods:

It includes different types:

- i By drying the food
- ii Kept in sugar Juice
- iii Kept things in mustered oil
- iv Kept in salts

## Drying of food:

In the past people used this method, they kept their food in sun light by which all water in that food items vaporize and decaying agents cannot take required environment to process. By this

## Kept in Sugar Juice:

In the past and also now people save their food items in the sugar juice. In this method sugar juice contains sucrose as its primary molecule; it separates most of the water from the food item. This method is often used for preservation of fruits.

## Keeping in Salts.

People used to do this preservation of food they keep their food item in the jar of salt, this method is oftenly used for egg preservation.

## Keeping in oil:

This process is used for the preservation of fruits and some vegetables by this method food is kept in oil which can not give oxygen and other necessary things to decaying elements, by this process we get "Achar".

## Advanced Techniques:

It includes

- i) Pasteurization
- ii) Canning
- iii) Adding chemicals
- iv) Drying
- v) Fermentation
- vi) Refrigeration.

## Pasteurization:

Food is briefly heated to kill harmful microorganisms. In this food is heated at  $125^{\circ}\text{F}$  for 15 minutes. Because some microorganisms do not die even at boiling temperature.

This method is used for milk, Juices.

### Canning:

Food is presented in Jars and Cans and heated at a specific temperature to destroy microorganisms also sealed them that no air can move in or out. This method is used to preserve fruits, meats and soups.

### Addition of chemical:

This process is used for preservation of milk juice and other liquid items in this process they ~~kept~~ the mixed chemical in food items which destroyed the power of microorganisms to spoil foods.

### Fermentation:

Beneficial microorganisms like bacteria or yeast, break down sugar in food, producing acids or alcohols that preserve the food.

### Refrigeration:

Food is kept under freezing temperature or just above than the freezing temperature at  $0^{\circ}\text{C}$  to  $4^{\circ}\text{C}$ , which slow down the growth of bacteria, this process is used for dairy products, eggs, meats and fruits.

Q.6 (a)

Let the 3 digit number be presented as

a is the hundreds digit

b is the Tens digit

c is the unit digit.

We are given the following.

1. sum of the digits  $\Rightarrow a+b+c \Rightarrow 15 \rightarrow (i)$

$\Rightarrow b+c = 12 \rightarrow (ii)$

$\Rightarrow b-c = 2 \rightarrow (iii)$

from equation (iii)

$b-c=2 \Rightarrow 2+c=b \Rightarrow b=c+2$

putting it in equation (ii)

$(c+2)+c=12 \Rightarrow 2c=10 \Rightarrow c=5$

put in equation (ii)

$b+c=12 \Rightarrow b+5=12 \Rightarrow b=7$

put these value in eq. (i)

$a+b+c=15 \Rightarrow a+7+5=15$

$a=3$

Three digit number is

$abc \Rightarrow 375$

Q.6 (c)

Circumference of circle  $\Rightarrow C = \pi d$

Area of circle  $\Rightarrow A = \pi r^2$

Diameter of the circle (d) = 6 cm

Radius  $\Rightarrow \frac{d}{2} = \frac{6}{2} \Rightarrow 3$

3  
Circumference of the circle  $C = \pi \times 6$

$$\Rightarrow 3.14 \times 6 \Rightarrow 18.849 \text{ cm}$$

Area of the circle  $A = \pi r^2$

$$\Rightarrow 3.14 \times 3^2 \Rightarrow 28.2744 \text{ cm}^2$$

Q. 6 (d)

i 13, 24, 46, 90, 178, 354

5, 6, 9, 14, 21, 30

Q. 8 (a)

3  
Length of the room = 15'

width is 60% of length

We can calculate width

$$\rightarrow 60\% \times 15 \Rightarrow .60 \times 15 \Rightarrow 9'$$

Dimension of the room

Length  $\rightarrow 15'$

Width  $\rightarrow 9'$

Q. 8 (b)

one leg = 48' (east direction)

other leg = 20' (North)

to find straight line we use  
Pythagorean theorem

$$C = \sqrt{a^2 + b^2}$$

$$C \Rightarrow \sqrt{(48^2) + (20^2)}$$

$$\Rightarrow \sqrt{2704}$$

$$\Rightarrow 52$$

She would have run 52'.

Q. 8 (c)

Average marks of 40 students

$$\Rightarrow 52.15$$

Mistakenly taken = 49

Actual marks = 85

$$\text{Total marks incorrect} = 52.15 \times 40 \Rightarrow 2086$$

$$\text{Corrected total marks} = 2086 - 49 + 85$$

$$\Rightarrow 2122$$

$$\text{New average} = \frac{2122}{40} \Rightarrow 53.05$$

Make headings and sub headings in answer

Explain complex concepts in simple terms.

Include diagrams and flowcharts for competitive edge.

Discuss practical applications of scientific concepts.

Show all steps and working for calculations.

Use diagrams and graphs