

Day: _____

Date: _____

PART - II

SECTION: I

Great

Keep it up

Best of luck

Work on management

Q. NO. 02.

(i) **LIPIDS:**

Lipids are organic compounds that are fatty acids or derivatives of fatty acids. The molecules of lipids are composed of carbon, hydrogen and oxygen. These molecules are insoluble in water. They are predominantly found in butter, oils, meats, dairy products, nuts, seeds and processed foods.

Major types of lipids:

There are four major types of lipids i.e:

- i) Fatty acids
- ii) Glycerides
- iii) Non-glyceride lipids
- iv) Complex lipids

Fatty acids: These are the simplest forms of lipids, consisting of long chains of C-H bonds. They may be saturated or unsaturated, depending upon the type of bond between carbon and hydrogen atoms.

Glycerides: These are the lipids that are formed when glycerol and fatty acids are esterified. These are known as acylglycerols. These can be classified on the basis of number of fatty acids attached to it. e.g. monoglycerides, diglycerides, triglycerides.

Non-glycerides: These are the lipids that do not contain glycerol, but may contain other compounds such as alcohols, or fatty acids.

Complex lipids: These are esters of fatty acids involving the compounds of alcohols and fatty acids. Examples of complex lipids may be phospholipids and amino-lipids.

Functions of lipids:

Lipids are responsible for following functions in the body:

1. They store and provide energy.
2. They serve as major component of cell-membranes, surround and protect organs.
- 2- Provide insulation to aid in temperature regulation.

(ii) ✓

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(ii) MEASURES FOR ENERGY

CONSERVATION AND SUSTAINABLE USE

Energy can be conserved and used sustainably by adopting various approaches. Some of these are enlisted below:

Regulating energy usage: Using less hot water, turning off appliances when not in use and consumption of natural light during the day hours.

Using energy-efficient appliances: Replacing higher energy consuming appliances with energy-efficient ones. For example, laptops for desktops, toasters against conventional ovens etc.

Insulation of spaces: Ensuring proper insulation of spaces like homes and offices also helps in conserving energy.

Use cold water for household chores: Replacing hot water with cold water for fulfilling household chores may reduce energy load. E.g.: washing clothes with cold water, etc.

Day: _____

Date: _____

Using alternative sources of energy. This includes installing wind mills or solar panels to ensure sustainable use of energy and preservation on non-renewable sources of energy.

Avoiding motor-vehicles for short distances. Using cycles or simply walking to get to short distances can greatly reduce consumption of energy.

Using LED bulbs: This can ~~save~~ ~~enact~~ reduce energy consumption by at least 80 percent.

Day: _____

(iii)

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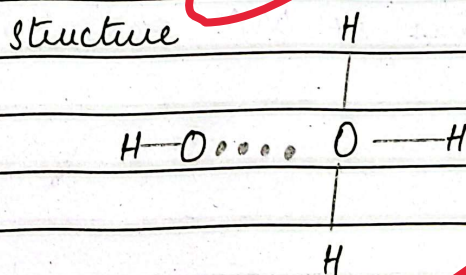
(iii) HYDROGEN BONDING

Hydrogen bonding is a type of weak intermolecular force that occurs when a hydrogen atom covalently bonds to a highly electronegative atom such as Cl, F, O etc.

1. When an atom of hydrogen bonds to a highly electronegative atom, it makes the former partially positive.
2. Hydrogen bonds are weaker than covalent bonds but stronger than Van der Waals forces.

Hydrogen Bonding with Structures:

1. Water: Each molecule forms hydrogen bond with four other water molecules.



The dotted line represents hydrogen bond

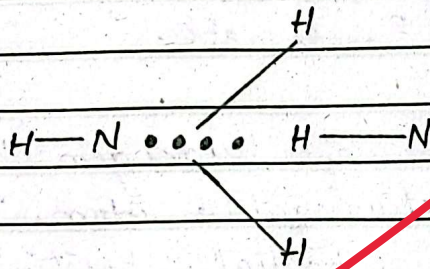
Day: _____

Date: _____

Day: _____

2- Ammonia (NH_3): Hydrogen bonds occur between the hydrogen atoms of one molecule and the lone pair of nitrogen atoms of another.

Structure:



The dotted line represents hydrogen bond.

- 1- Hydrogen bonding plays a crucial role in stabilizing molecular structures.
- 2- They are responsible for high melting and boiling points of water.
- 3- In biological sciences, these bonds preserve the structure of DNA and proteins.

(iv) NEA

The central nervous system and spinal cord

The human nervous system consists of special parts of the nervous system.

Main

CENTRAL NERVOUS SYSTEM

- consist of Brain and Spinal cord

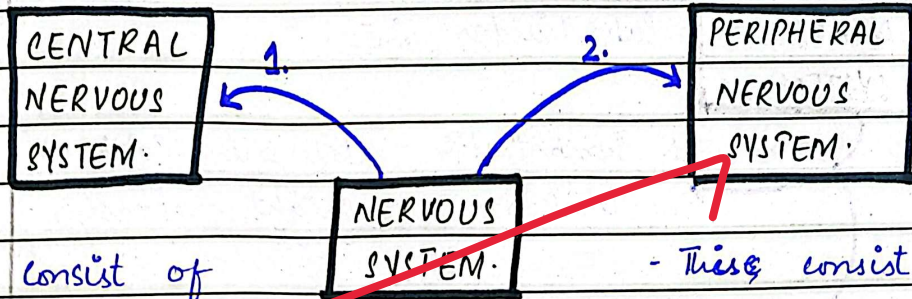
- control and process information and transmit it to body

(iv) NERVOUS SYSTEM OF HUMAN BODY.

The nervous system or the central nervous system (CNS) of the human body is made up of brain and spinal cord.

The nervous system of the human body is a complex network of specialized cells responsible for transmitting signals between different parts of the body.

Main Divisions:



- Consist of Brain and Spinal cord

- These consist of nerves extending outside the CNS. Including cranial and spinal nerves.

FUNCTIONS

- Control center
 - Processing sensory information and interpreting it
 - Transmitting instructions to body.

- Connects CNS to limbs and organs.
 - Transmits signals from brain to spinal cord.

SUB-DIVISIONS OF PNS.

SOMATIC NERVOUS SYSTEM.

- Controls voluntary movements

AUTONOMIC NERVOUS SYSTEM

- Controls involuntary movements.

AUTONOMIC NERVOUS SYSTEM

Sub divides into:

1. Sympathetic Division:

Activates fight or flight response

2. Parasympathetic Division:

Promotes rest and digestive activities.

BASIC UNIT (NEURON):

The basic unit of nervous system is a neuron.

Day: _____

Date: _____

It consists of:

- 1- Cell-body (Soma): contains nucleus and organelles.
- 2- Dendrites: receive signals from other neurons.
- 3- Axon: transmits signals to other neurons or muscles.
- 4- Synapse: junction where communication occurs between neurons.

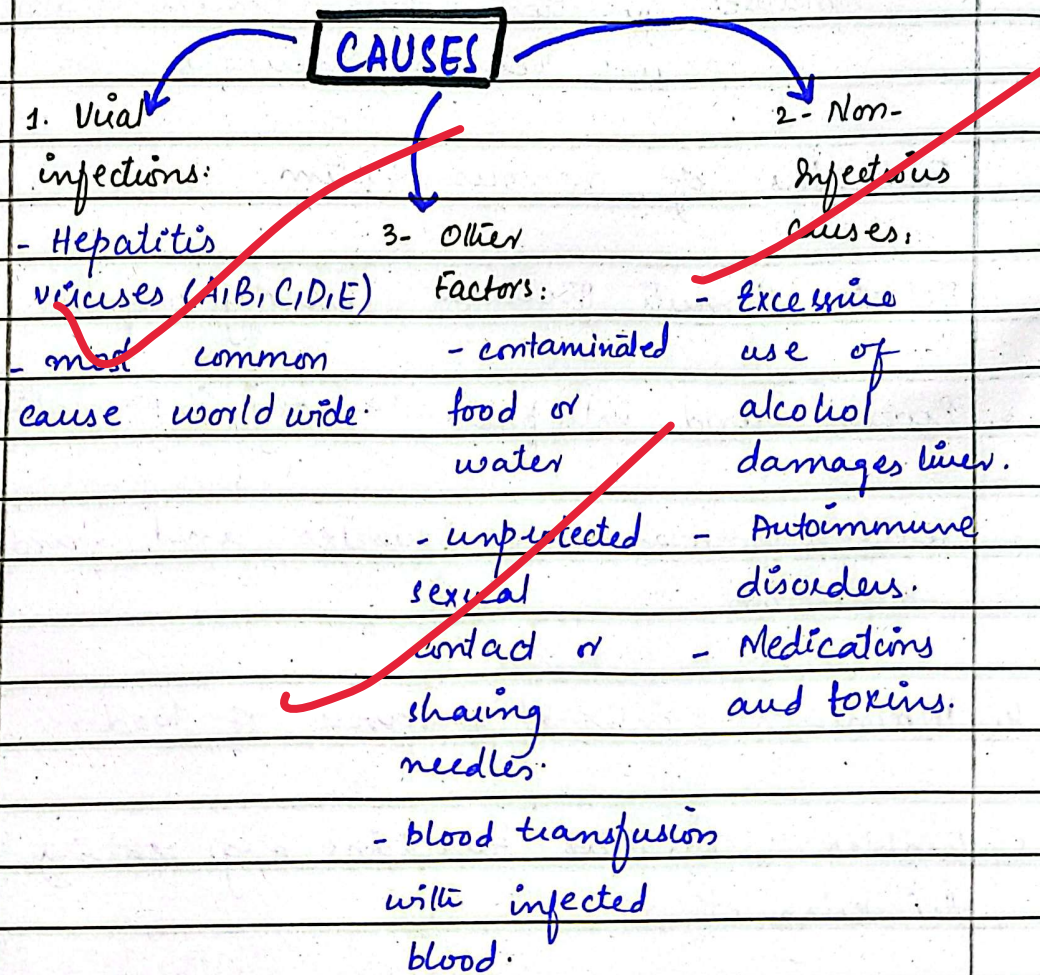
Functions of nervous system

1. Detects stimuli through sensory organs.
2. Processes and interprets sensory information.
3. Sends commands to muscles and glands for action.
4. Maintains internal balance of body.
5. Enables cognitive functions e.g: ~~eating~~ thinking etc.

Q. NO. 04.

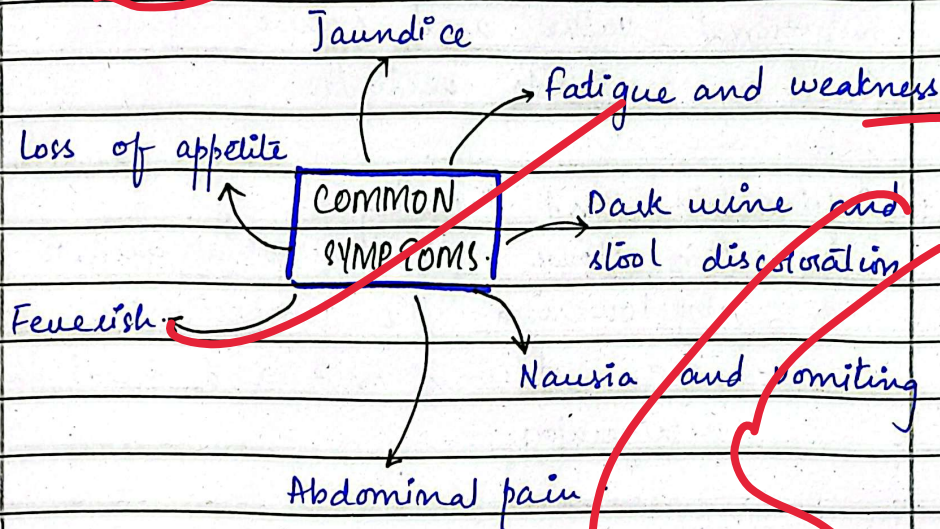
(i) HEPATITIS

It is the inflammation of the liver. It can range from mild to severe and may be acute or chronic.



SYMPTOMS

Early symptoms, often mild and asymptomatic.



PREVENTIONS.

- 1- Vaccination for hepatitis A and B.
- 2- Maintaining hygiene.
- 3- Drinking clean, boiled or bottled beverages.
- 4- Avoid sharing needles, razors, etc.
- 5- Informed sexual contact.
- 6- Avoiding misuse of alcohol.
- 7- Test blood before transfusion.

(ii)

METHODS OF FOOD PRESERVATION:

Food preservation techniques are used to prevent spoilage, maintain nutritional value and ensure safety.

Common methods include:

1- Refrigeration and Freezing:

- This slows down microbial growth by lowering the temperature.
- e.g: storing milk and meat in refrigerators.

2- Canning:

- Food is heated to kill microbes, then sealed and stored in containers.
- e.g: Canned fruits and vegetables.

Dehydration:

- Removes water to inhibit microbial activity.
- e.g: dried fruits e.g: raisins.

Pasteurization:

- Heating liquid to kill bacteria without altering the flavor.
- e.g: Pasteurized milk.

Day: _____

Date: _____

5- Pickling:

- Preservation of food in salt concentrated solutions e.g. vinegar or Brine.
- e.g. Pickled cucumbers.

6- Use of preservatives:

- Adding different chemicals (e.g. salt, sugar, etc) to inhibit ~~spilage~~ ^{spilage} over long period of time and increase shelf life.
- e.g. sugared jams.

7- Vacuum sealing:

- Removing air from packaging to prevent oxidation and microbial growth.
- e.g. coffee beans in vacuum sealed containers.

(iii) FERTILIZERS:

Fertilizers are substances added to soil or plants to provide essential nutrients and enhance growth.

TYPES OF FERTILIZERS:

1. Organic Fertilizers.

Derived from natural resources e.g. plants, animals, or minerals. E.g. Compost, manure, and bone meal.

2. Inorganic (Chemical) Fertilizers.

Manufactured synthetically to provide targeted nutrients to soil or plants.

→ Nitrogenous fertilizers: to promote leaf growth
e.g. urea, ammonia etc.

→ Phosphatic fertilizers: for root and flower growth
e.g. super phosphate etc.

→ Potassic fertilizers: over-all plant health and disease prevention. e.g. KCl etc.

3. Biofertilizers.

Contains living microorganisms that enhance availability of nutrient. e.g. rhizobium for nitrogen fixation in legumes.

4. Micronutrients fertilizers:

To ensure the availability of trace elements e.g. zinc, and manganese.

1. Enhanced agricultural productivity



3. Increased crop yield and quality

2. Improved soil fertility

(iv)

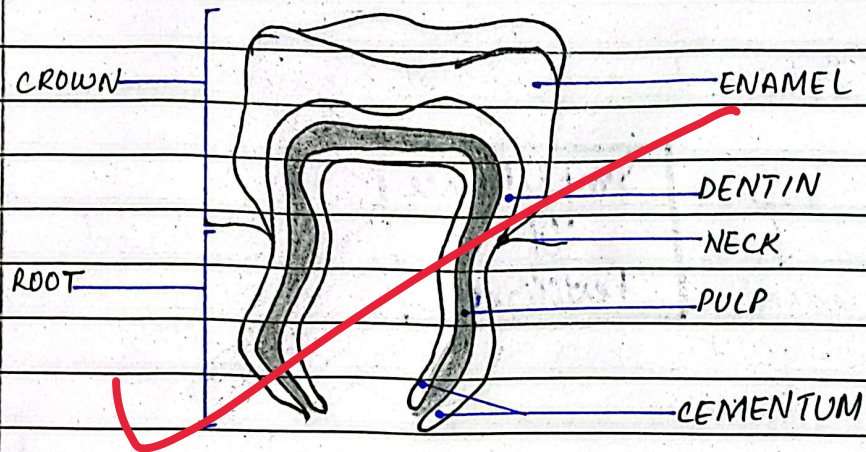
ANATOMY OF A HUMAN TOOTH:

FIGURE: HUMAN TOOTH.

A human tooth is a hard structure in mouth, designed for chewing and biting. Each tooth has following distinct parts:

1. CROWN:

- The visible part of tooth above the gum line.
- covered with enamel, the hardest substance in the body.

2. NECK:

- The narrow area where the crown and root meet
- It is encircled by the gum tissue

Day: _____

Date: _____

3- ROOT:

- The portion embedded in jawbone.
- It is anchored by cementum and supported by the periodontal ligament.

4- ENAMEL:

- It is the outermost covering of tooth which protects it from wear and decay.

5- DENTIN:

- Lies beneath the enamel and makes up most of the tooth.
- Softer than enamel.

6- PULP:

- It is the innermost layer of muscles containing nerves and blood vessels.
- It is vital for nourishment and sensory functions of tooth.

7- PERIODONTAL LIGAMENT:

- Connects the tooth to surrounding bone.

8- CEMENTUM:

- A calcified layer covering the root, helping secure the tooth to the jaw.

Day: _____

Date: _____

Incisors

- for cutting
food.

**TYPES OF
TEETH**

Premolars
and
Molars.

- for grinding
and chewing.

Canines

- for tearing
food.

SECTION - II

Q. NO. 06.

(c)

Diameter of circle = 6 cm.

i- Circumference = ?

ii- Area = ?

Soln: (i)

$$\therefore \text{Circumference} = \pi d \text{ or } 2\pi r.$$

$$\therefore = 3.14 \times 6 \quad \begin{array}{r} 3.142 \\ 6 \end{array}$$

$$\boxed{\text{circumference} = 18.752 \text{ cm}} \quad \begin{array}{r} 18.752 \end{array}$$

(ii)

$$\therefore \text{Area of circle} = \pi r^2 \rightarrow \textcircled{1}$$

$$\text{Also, } r = \frac{d}{2} \quad \begin{array}{r} 3.142 \\ 9 \end{array}$$

$$\therefore \text{eq. } \textcircled{1} \text{ becomes; } \quad \begin{array}{r} 28.278 \end{array}$$

$$\text{Area} = \pi \left(\frac{d}{2} \right)^2$$

$$= 3.142 \left(\frac{6}{2} \right)^2 = 3.142 \times 9$$

$$\therefore \boxed{\text{Area} = 28.28 \text{ cm}^2}$$

(b)

ratio of slices as small: med: large = 2:3:4
 Total no. of req. slices = 18 slices.
 weight of each slice = 40 gm.
 price of smaller pizza = 320 RS.

(i) Price of total pizza = ?

(ii) Weight of total pizza = ?

Soln:

First we need to find the no. of slices in each pizza.

∴

$$2x + 3x + 4x = 18$$

$$9x = 18$$

$$x = 2$$

Now,

no. of slices in each pizza will be;

$$\text{small} = 2 \times 2 = 4 \text{ slices.}$$

$$\text{medium} = 3 \times 2 = 6 \text{ slices.}$$

$$\text{Large} = 4 \times 2 = 8 \text{ slices.}$$

Now calculating the weight of total pizza;

$$\therefore \text{one slice} = 40 \text{ gm}$$

∴

$$18 \text{ slices} = 40 \times 18 \text{ gm}$$

$$\text{Total weight of pizzas} = 720 \text{ gms}$$

$$\begin{array}{r} 18 \\ \times 40 \\ \hline 720 \end{array}$$

Day: _____

Date: _____

Now,

$$\text{price of one slice} = \frac{320 - 160}{4} = 80$$

$$\text{" " " " } = 80 \text{ Rs.}$$

$$\therefore \text{price of 18 slices} = 80 \times 18$$

$$\boxed{\text{" " " " } = 1,440 \text{ Rs}}$$

$$\begin{array}{r} 80 \\ \times 18 \\ \hline 640 \\ 80 \times \\ \hline 1440 \end{array}$$

Day: _____

Date: _____

Q. NO. 08.

(a)

$$\text{width of rectangle} = 60\% L$$

$$\text{length of room} = 15 \text{ ft.}$$

(i) length of room = ?

(ii) width of room = ?

Soln:

For rectangle,

From above data;

$$\text{width of rectangle} = \frac{60}{100} \times 15$$

$$\therefore \boxed{\text{width} = 9 \text{ ft}}$$

Also,

$$\boxed{\text{length} = 15 \text{ ft}}$$

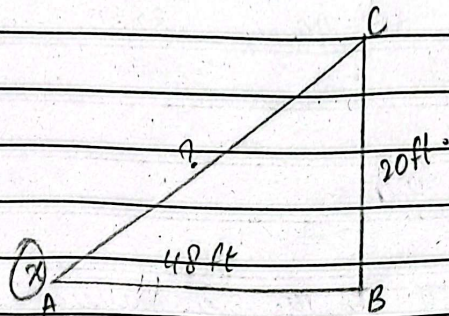
Hence, dimensions of the ~~room~~ are;

$$\boxed{L = 15 \text{ ft}}$$

and

$$\boxed{W = 9 \text{ ft}}$$

(b)



$B = AB = 48 \text{ ft.}$

$P = BC = 20 \text{ ft}$

$H = AC = ?$

Soln:

For triangle;

$\therefore H^2 = P^2 + B^2$

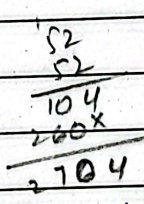
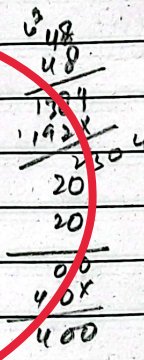
$H^2 = (20)^2 + (48)^2$

$H^2 = 400 + 2304 = 2704$

Taking square root on both sides;

$\sqrt{H^2} = \sqrt{2704}$

$\therefore H = 52 \text{ ft}$



Had Veena ran straight from where she started to the water station, she would have ran 52 ft.

Day: _____

Date: _____

(c)

average marks of 40 students = 52.15

85 mistaken for 49;

what will be the new average = ?

Soln:

$$\therefore \frac{x}{40} = 52.15$$

$$x = 52.15 \times 40$$

$$\therefore x = 2086$$

Now;

$$85 - 49 = 36$$

$$\therefore \text{new total marks} = 2086 + 36$$

$$\text{" " " " } = 2122$$

\therefore

$$\text{new average} = \frac{2122}{40}$$

$$\text{new average} = 53.05$$

Day: _____

Date: _____

(d)

37 people like veg. pizza.

25 people like chicken pizza.

3 like neither.

what is the probability that a random person likes chicken pizza = ?

Soln:

$$\text{Total people} = 37 + 25 + 3$$

$$= 65 \text{ people.}$$

Now,

% of those who like ^{chicken} veg. pizza will be;

$$\Rightarrow \frac{25}{65} \times 100$$

$$\Rightarrow 38.5\%$$

Therefore, there is 38.5% chance that the random person will like chicken pizza.