Date: 19/12/24

Part II

Section-I

Q2-

a) Lipids

Lipids are essential component of the body composed of fatty acids and Trigly ceride. They are also known as Fats. It exists in various food sources such as oil vegetable oil, milk and butter.
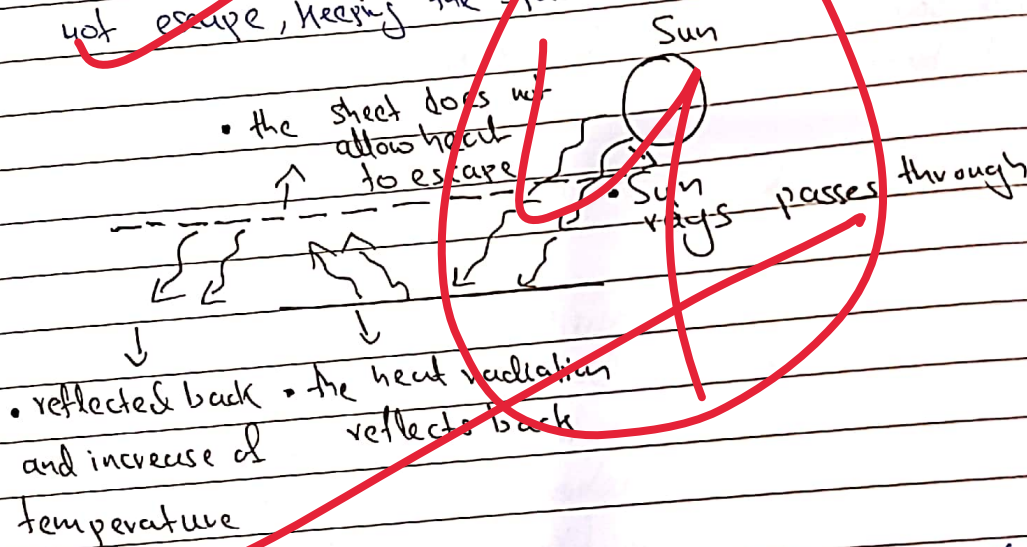
Types of Lipids

Lipids are majorly divided into saturated and unsaturated fats. Saturated fats are mainly found in product, like butter and are solid at room temperature. Whereas, unsaturated fats are present in products like vegetable oil and are liquid at room temperature.

Functions of Lipids

Lipids have various functions. First, they keep the body insulated and warm. Second, they are shock absorbers of the body. Fourth, they are source of energy (0.4 kcal / unit). Fifth, they form the membrane of cells which acts as semi-permeable boundry for cellular activities.
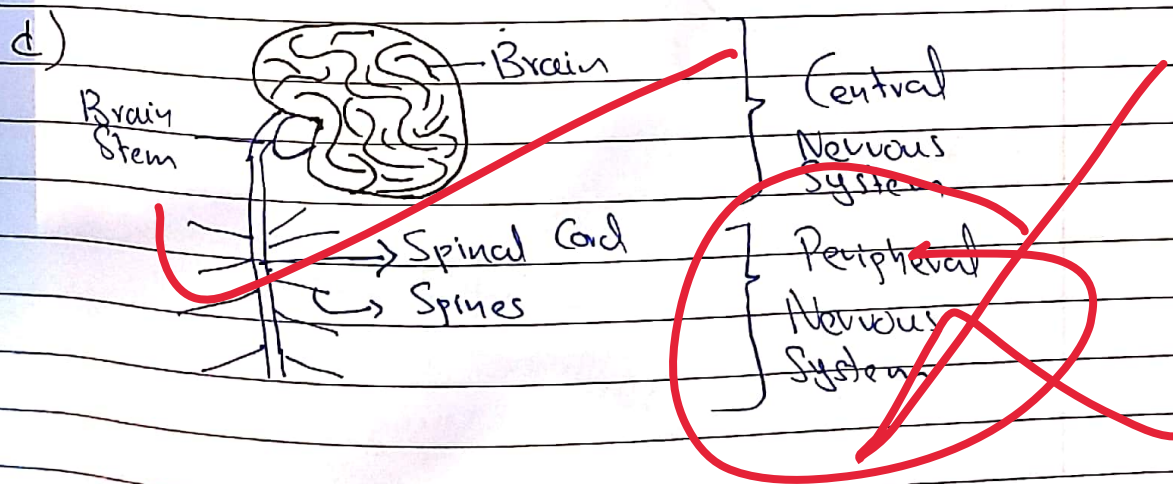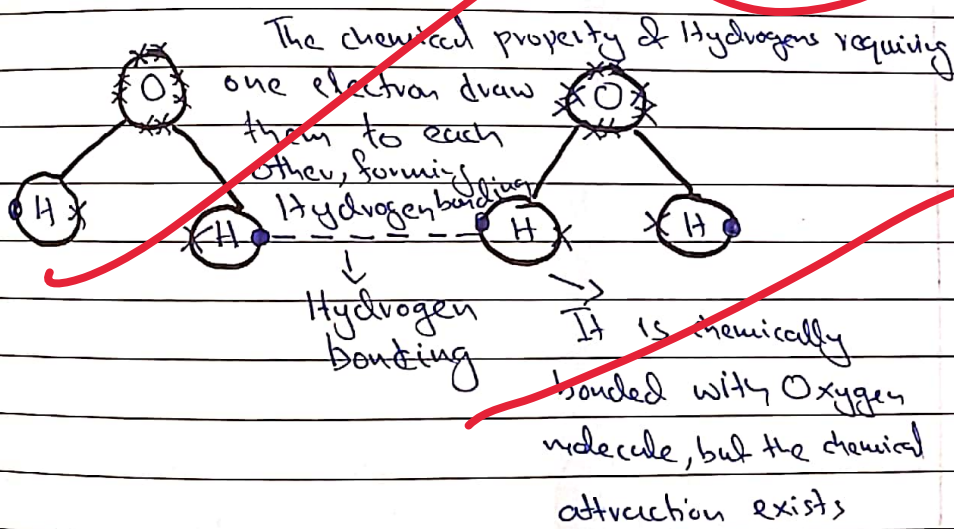
b) Energy conservation can be done through various techniques: Houses and office buildings can be insulated to keep it warm during summers and cold during winters. Hence, conserving the energy. The wide use of sa renewable energy sources like solar energy, wind energy, tidal energy can be stored. In nurseries green houses conserve energy through greenhouse effect where the reflected energy from the sun could not escape, keeping the space warm.

- the sheet does not allow heat to escape
- reflected back and increase of temperature
- the heat radiation reflected back

Sun

Sun rays passes through

There are various sustainable uses of energy especially in the form of renewable energy. Since the non-renewable sources are scarce, renewable energy consistently provides with energy to meet the energy needs. For example, the solar energy constantly provide energy which is stored and converted to electrical energy. Hybrid Vehicles are another way of its sustainibility as the battery conserves energy reducing the consumption of uneccessary fuel.

c) Hydrogen bonds

Hydrogen bonding is a form of bonding that include Hydrogen elements in two. lets take the example of Water (H_2O). Although the Hydrogen bonds are chemically attached Ionic bonding, the single Hydrogen element has a chemical bonding with Hydrogen element of another compound as shown in the figure. This is one of the reasons of H_2O molecules bonded together unless a certain amount of pressure is exibited upon them, causing breakage.
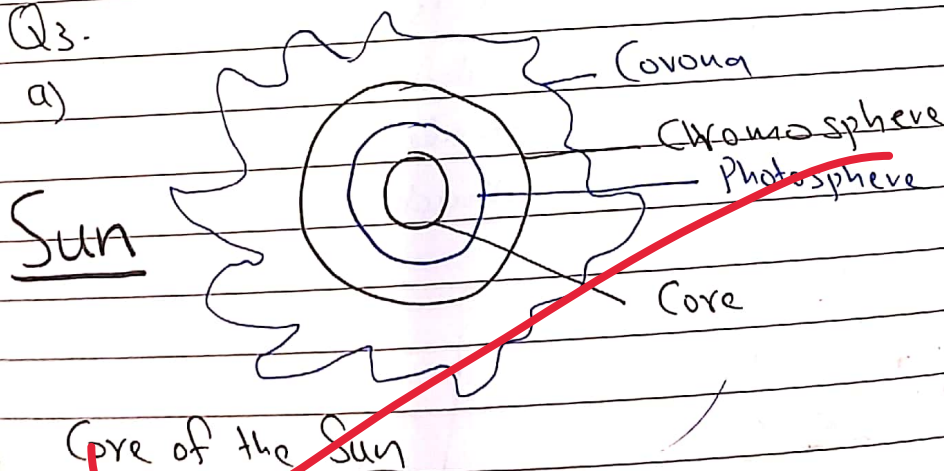
The chemical property of Hydrogen requiring one electron draw them to each other, forming Hydrogen bonding

O

H

H

O

H

H

Hydrogen bonding

It is chemically bonded with Oxygen molecule, but the chemical attraction exists

d)

Brain

Brain Stem

Spinal Cord

Spines

Central Nervous System

Peripheral Nervous System

Nervous System is the Intelligence system of the body that recieves, analysis and responds signals in the body. It coordinates and command data with both voluntary and involuntary responses. The Central Nervous system includes the brain, brain stem and Medulla Cortex. It is responsible for memory, a thinking process, fight and flight survival instincts, etc. In additions, it commands body on voluntary muscular reaction especially in musculoskeletal region. Involuntary response generates in lower part of central Nervous system that coordinate activities such as heart rather beat contraction.

Peripheral Nervous system comprises of spinal cord. ~~Irrelevant~~ It acts as a transit, responsible for transmitting information to the brain and recieve electric signals for both voluntary and involuntary responses.

Q3.
a)

Sun

Core of the Sun

Corona
Chromosphere
Photosphere
Core

The core of the Sun is its hottest region with temperature in million Centigrade. The gravity exists from this region. It is so strong that

it prevents sun from expanding after massive energy release. The main elements are Hydrogen (92%) and Helium (8%). Through the process of Fussion, the Hydrogen elements fuse into Helium, releasing massive energy.

Chromosphere

This is the upper layer of the sun with temperature of around 5000°C. Sun spots exist at this place where the temperature are relatively lower. The energy as heat and light form Corona. This is the crown shaped structure of the sun. In the process, solar winds are released which are capable of destroying the atmosphere of planets like mercury. However, Earth's magnetic region protects earth from solar winds and forms Aurora in the process.

When the hydrogen will be exausted, the sun will can fuse Helium together. This would result in massive expansion of sun as the force exerted outwards gets greater than gravity. This happens as the sun becomes a dying star.

b) Tsunami

Tsunami occurs when the huge waves from the sea enters the dry land, causing flood in the region. This not only result in loss

of life, but also destruction of infrastructure, diseases, loss to economy and environmental damage.

How is it generated

Tsunami is mainly generated as a result of earthquake in the Oceanic Crust of Lithosphere. The energy released in the process is transmitted into water. The deep oceanic current forms that gain massive speed. The energy and from the current produces of huge tid waves. If These water currents hit the land with massive speed, causing huge volumes of water entering the dry land and cause creating destructions.

Recent Tsunamis

Bangladesh, 2024
Spain, 2024

:) Environmental Pollution

Environmental Pollution is the presence of toxic/uneccess substances in the environment constituting of land, water and air. Land and Water pollution could include the presence of soft substances in solid or liquid forms such as domestic or factory waste, organic waste, plastic wastes etc. Air pollution include toxic pollutants in atmosphere that is deterrent to the ecosystem. This may include large

particles as well such as dust particles. Harmful gases such as excess lead is poisonous in excessive. Large amount of Sulpher dioxide may cause acid rain. Chemicals like CFC depletes Ozone.

Harmful effects of pollution

Pollution, in humans, causes serious health issues. Excess of Carbondioxide or Carbon moxide could result in complication involving lung diseases. Pollutants like smog, additionally, affects the eyes and throat. Diseases like Cholera and Diarhea Dierrhea prevails from dirty drinking water. Land pollution increases infestations and rodents in Metro-cities like New York. As mentioned before, Sulfadioxide causes acid rain, harmful to plants and deteriorating to marbles. For example, Taj Mahal is loosing its colour due to acid rain as Sulpheric acid produce oxidises marbles.
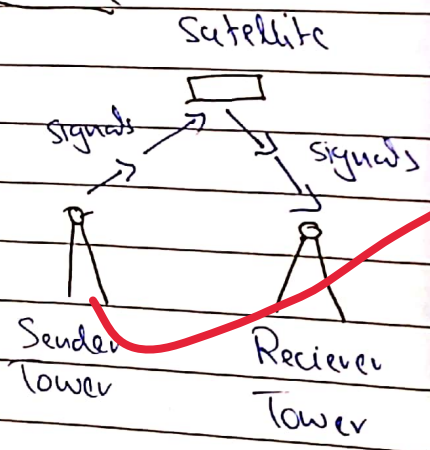
Measure to Curb it

Recycling management should be introduced. Bins with recycleable wastes should be classified accordingly. People should be educated about their responsibilities in disposing recycleable wastes. International campaigns like Paris Agreement and climate conferences like the recent COP29 must provide latest breakthroughs to to avoid also minimise air pollution. Unfortunately, the

Global North agreed to contribute $30 billion to the cause. It must be a least four figures for effective implementation of action against climate pollutants. In addition, local govt. should be empowered to tackle the pollution at smaller scales. Public-Private partnership should be encouraged. For example, Quetta waste management has been handed over to (Safa), a public-private waste management organisation.

d) Wireless Communication

Wireless Communication is a major breakthrough in Communication network, involving transfer of information from one geographical location to another without a 'wired' medium. It could travel within a city, within a region and between countries throughout the globe. The medium involves microwaves and radiowaves signals. For example, a remote transmits certain frequency of microwaves that command TV to switch a channel or increase volume. These signals can travel as fast as the speed of light.

Satellite

Satellite

Satellite

signals   signals

Sender   Reciever
Tower   Tower

The signals are transmitted as always to the satellite in a specified frequency. The satellite interprets the data and sends it to the targetted location. In certain events, it coordinates with other satellites to pin the location of sender as well as reciever. For example, GPS system involves coordination between various satellites to pin the exact location commanded.

Section - II

Q6-   let the three digits be x, y, z

Sum of digits
- let 'x' be unit digit
- let 'y' be 10th digit
- let 'z' be 100th digit

$$x + y + z = 15 - (2)$$

Sum of 10th and unit digit

$$x + y = 12 - (1)$$

Difference of Unit digit from 10th digit

$$y - x = 2 - (3)$$

Substitute equation (1) into (2)

$$12 + z = 15$$
$$z = 15 - 12$$
$$z = 3$$

Elimination method to find y from equation (1) and (3)

$$x + y = 12 \rightarrow (1)$$
$$-x + y = 2 \rightarrow (2)$$
$$2y = 14$$
$$y = 7$$

Substituting 'y' in equation (1) to find x

$$x + 7 = 12$$
$$x = 12 - 7$$
$$x = 5$$

Therefore, xyz xyz should be $\boxed{573}$

b) let small pizza be 's'
let medium pizza be 'm'
let large pizza be 'l'

If there is one slice per person, the total slices will be 18.

Total slices $= 18$
Total weight $= 18 \times 40$
$$\boxed{1 = 720g}$$

Number of slices in smaller pizza

$$\frac{2}{9} \times 18 = 4 \qquad \therefore 4 \text{ slices in smaller pizza}$$

*/Assuming the size of slice is same for all the pizzas

$$\text{Cost/slice} = \frac{320}{4}$$

$\Rightarrow$ Total price of smaller pizza / Total slices of smaller pizza

$$\text{Cost/slice} = 80 \text{ Rs/-}$$

Total Cost = Total slices of all pizzas × Cost per slice
$$= 18 \times 80$$
$$= \text{Rs. } 1440$$

Therefore the total cost of pizzas are Rs 1440 while its total weight is 72 oz.

c) Diameter $= 6$ cm

$$\text{Radius} = \frac{\text{Diameter}}{2}$$

$$= \frac{6}{2} = 3 \text{ cm}$$

Circumference of Circle $= 2\pi r$
$$= 2 \times \frac{22}{7} \times 3$$
$$= 18.85 \text{ cm}$$

• Therefore, the Circumference of Circle is 18.85 cm and Area of circle is 28.28 cm.

Area of Circle $= \pi r^2$
$$= \frac{22}{7} \times 3 \times 3$$
$$= 28.28 \text{ cm}$$

d) i)

Position :	1st	2nd	3rd	4th	5th	6th
Step 1 :	13	24	46	90	178	264

Step 2
(difference)

19   22   44   88 +176

Step 3
(Multiplication
series)

×2   ×2   ×2   ×2

From the above series, we took the differences
of the consecutive numbers in Step 2.

In Step 3, we realised that the pattern
form has consecutive multiplication of 2 in
each of the difference identified in Step 2.

Therefore, the difference of 4th and 5th (88) is
multiplied by 2 to attain the difference of
5th and 6th number (88 × 2 = 176).

of 176   5th
The difference is added to the original number
in Step 1 in order to attain original 6th number.
(178 + 176 = 264) Therefore the 6th number is
264.

ii)

Position :	1st	2nd	3rd	4th	5th	6th
Step (1)	5	6	9	14	21	30

Differences
Step (2)

Difference	1	3	5	7	9

From Step 2, we identified the pattern of the numbers. The difference of the numbers were odd consecutive number in ascending order.

Therefore the difference in 5th and 6th number will be the ascending odd number next in the consecutive range of 1, 3, 5, 7 i.e, 9. Since the odd numbers are the differences between consecutive number, 9 is added to the 5th in the series in order to attain the missing number. Hence the 6th number is $(21+9)$ $\boxed{30.}$

Q8-

a)   Let length be (n)

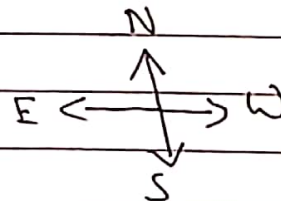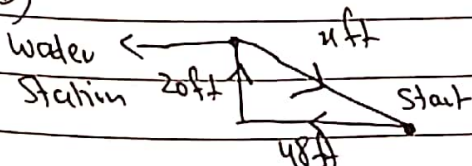$\therefore$ Width $= n \times 60 \%$

$= 0.6n$

Since length $= 15$ ft

$n = 15$

Therefore the dimensions of the room are 15 feet long and 9 feet wide.

Width $= 0.6 \times 15$

$= \dfrac{6^3}{10_2} \times 15^3 = 9$ ft

b)

water
Station

N

E $\longleftrightarrow$ W

S

nft
20ft
48ft
Start

let the distance from 'water Station' to Starting point be (n)

Using Pythagoras Theorem

$$Hypothnese^2 = Base^2 + Height^2$$
$$H^2 = B^2 + A^2$$
Base = 48
Height = 20
Hypothnese = x

$$x^2 = 48^2 + 20^2$$
$$= 2304 + 400$$
$$x^2 = 2704$$

Since 2704 is closest to the square of 50 and 4 is the square of 2, the exact square root of 2704 is 52

$$\therefore x^2 = \sqrt{52}$$
$$x = 52$$

Therefore the total distance from water station back to the starting point is 52 feet.

c)   Average = $\dfrac{\text{Total marks}}{\text{Total Students}}$

$$52.15 = \frac{\text{Total marks}}{40}$$

2086 = Total marks

Correcting the error by deducting 49 and adding 85

Total Correct = 2086 - 49 + 85
Marks

Total marks = 198/ 2122

Average (new) = $\dfrac{106\cancel{4}}{2122}$ = 53.05
40
20

d) Probability = $\dfrac{\text{The probable item}}{\text{Total Items}}$
(chicken pizza)

$= \dfrac{25}{25+37+13} = \dfrac{2\cancel{5}}{6\cancel{5}} = \dfrac{5}{13}$

Probability = $\dfrac{5}{13}$
(chicken pizza)