

PART - II

Follow a step-by-step method to break down complex problems into manageable parts.

Section - 1

Provide comprehensive answers by giving clear, concise, and detailed explanations.

Keep length of the all questions same.

Work on time management

One diagram per question is sufficient

Q:2

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

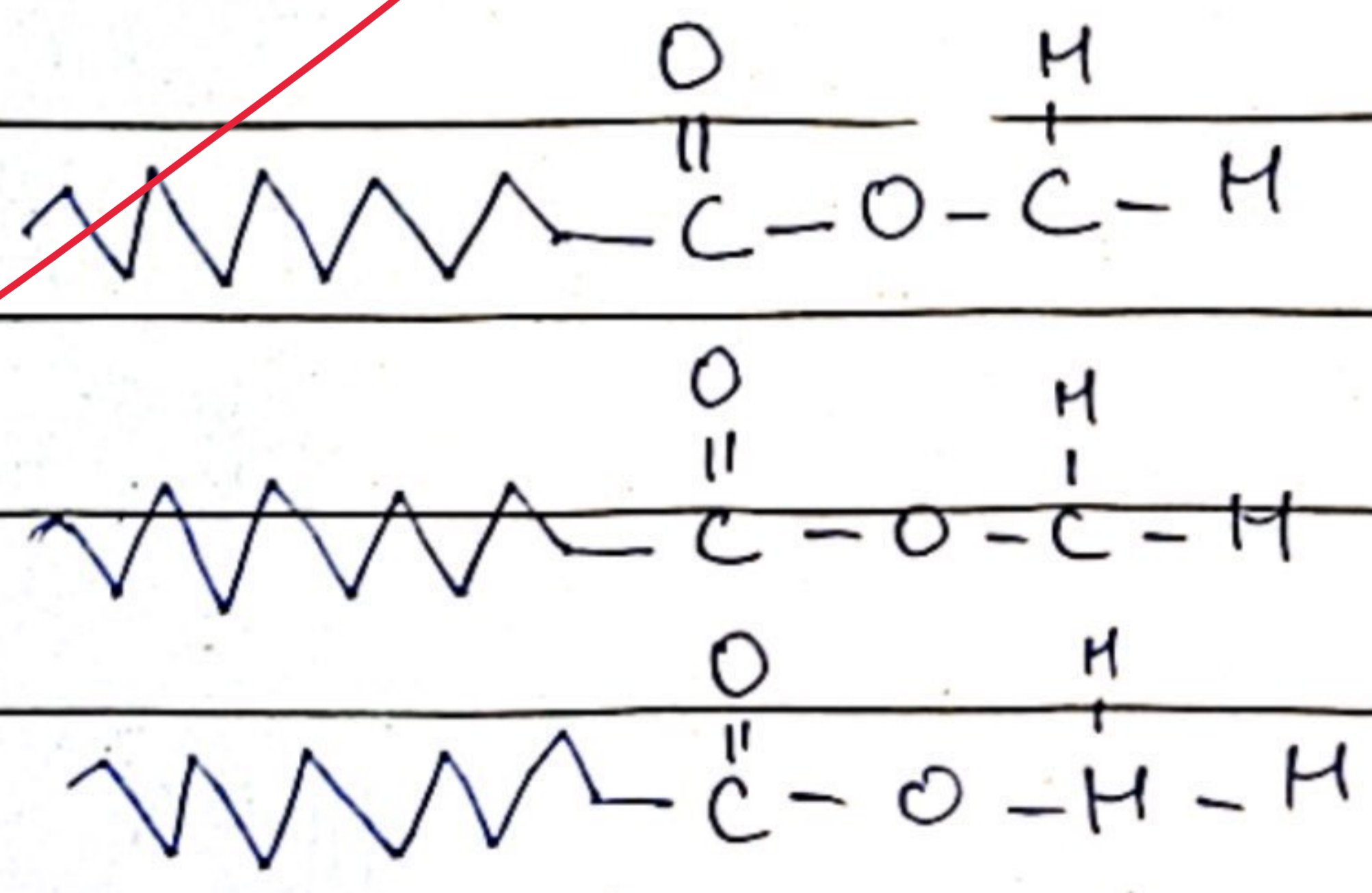
Lipids :-

Lipids are naturally occurring organic compounds having oils and fats. Lipids are present in micro-organisms, animals and plants. Lipids provide 9.1 kcal of energy per gram.

Basic unit of lipids :-

Triglyceride is the basic unit of lipid in which it is present in food and animals body.

Triglyceride → Glycerol + 3 Fatty acid



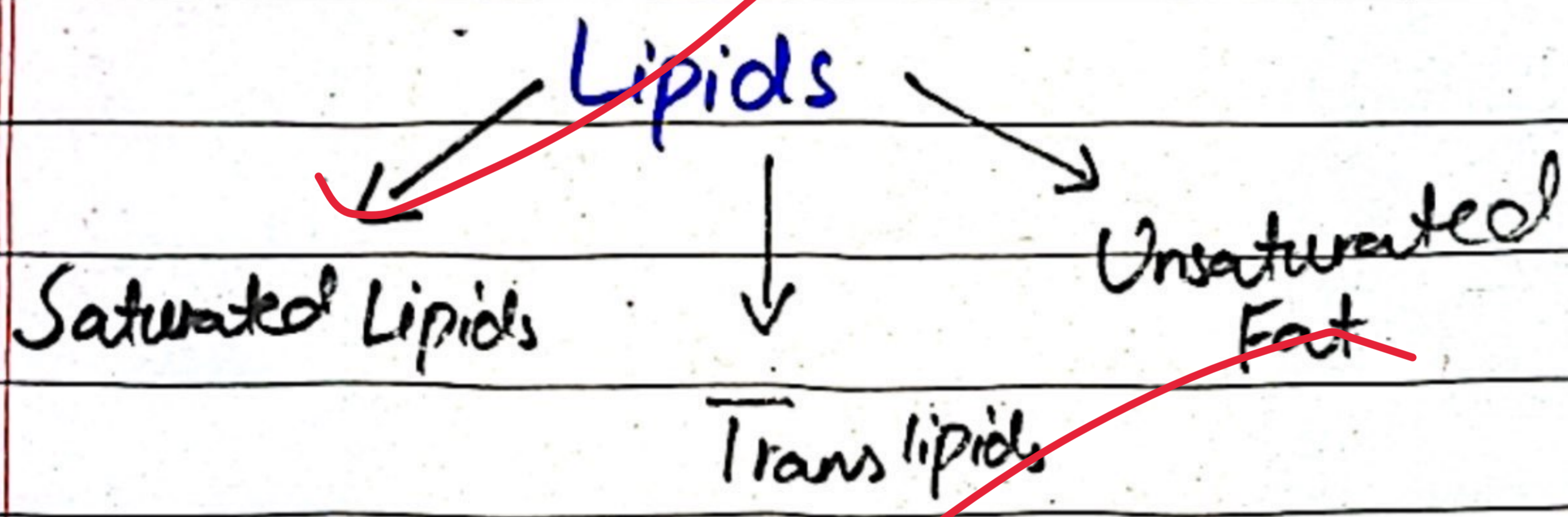
Structure of Triglyceride

Another important lipid is phospholipid.

Phospholipid → Glycerol + Fatty acid + Phosphoric acid + Alcohol

Common phospholipid is lecithin.

Types of lipids :-



(a) Saturated Fats :-

These are solid at room temperature like animal fats.

Common Examples :-

- Animal butter
- Margarine
- Cheese
- Milk

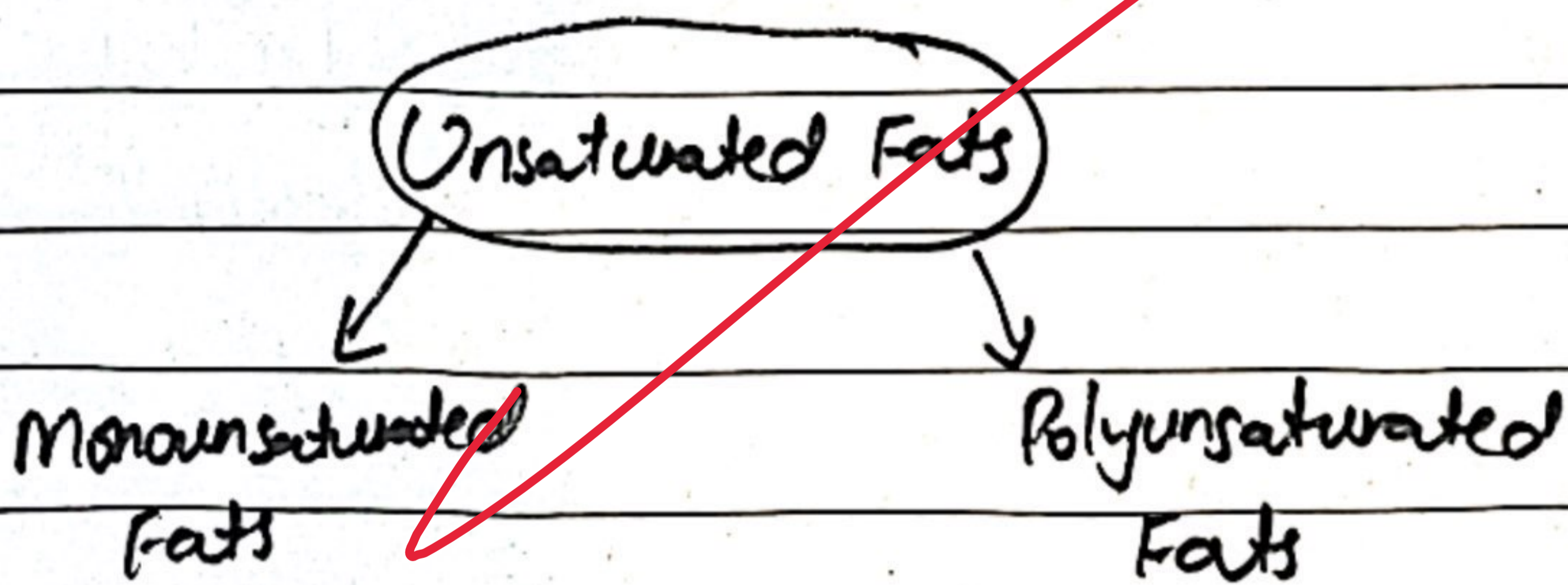
All have saturated fats. Bakery products like cookies, snacks are ~~are~~ have saturated fat.

Disadvantage :-

By eating too much saturated fat, the level of Cholesterol increases in body and it may cause liver diseases like "Fatty Liver".

(b) Unsaturated Fats :-

These are liquid at room temperature like ~~so~~ plant oils. Unsaturated fats are good for health.



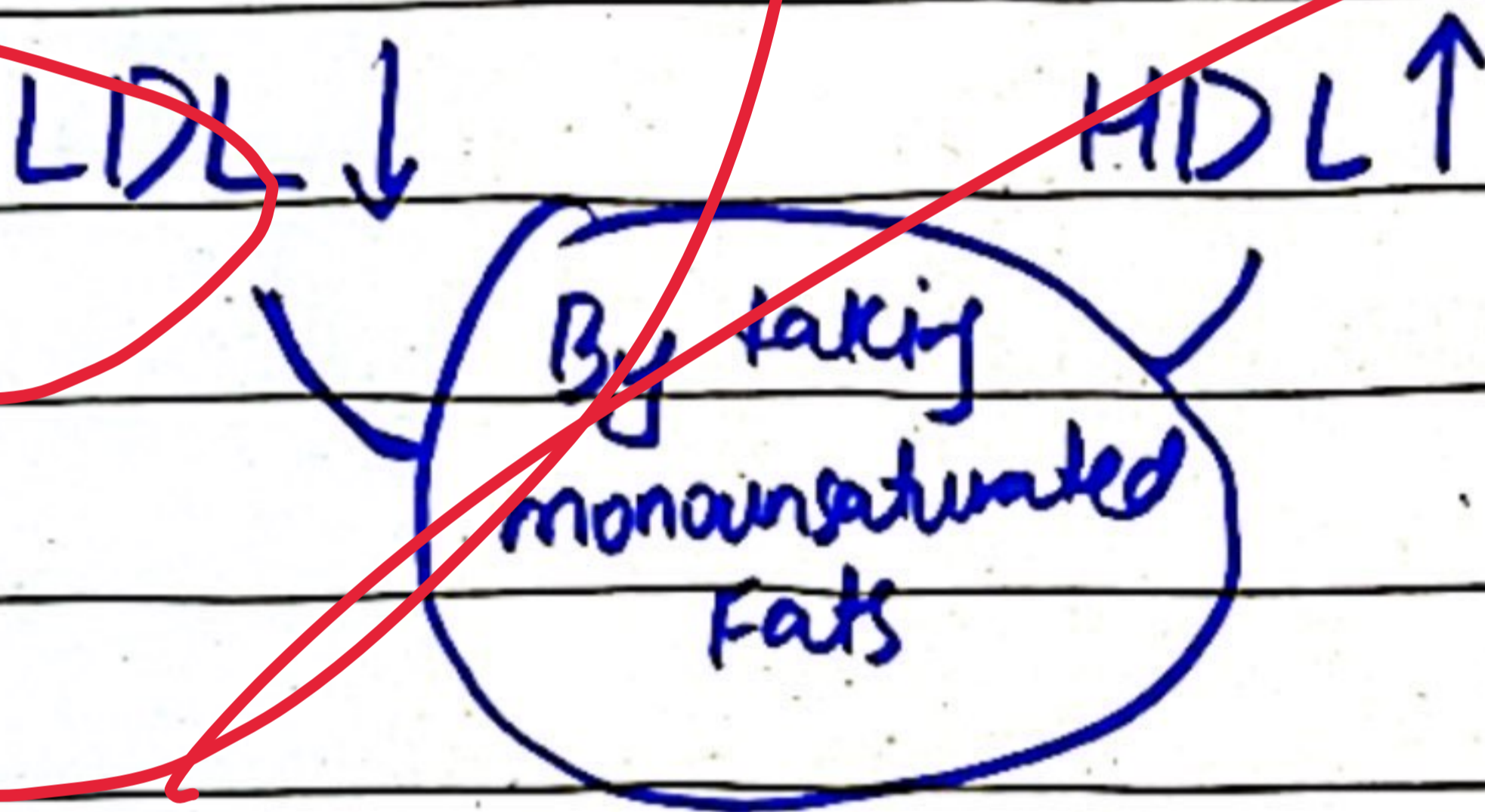
Monounsaturated Fats :-

Fats extracted from plant oils like Soyabean, Olive oil, canola and nuts

Avacado have monounsaturated fat.

Advantages:-

By eating monounsaturated fat, the level of bad cholesterol LDL decreases and the level of good cholesterol HDL will increase. It is useful for health.



Disadvantage:

By taking only unsaturated fats and not cut back to saturated fat will not reduce cholesterol level.

Polyunsaturated Fat:-

Fats extracting from Sesham oil, Safflower and Sunflower and corn oil are polyunsaturated fats. They also reduce bad cholesterol level.

in body.

Common types:-

Omega - 3

Omega - 6

Trans Fats :-

These are fats, produced from hydrogenation process. Actually it increases the shelf life of fats and make it hardened at room temperature.

Example :-

Cookies

Salad dressings

Snacks

Hydrogenated Food

Processed Food

All made from trans fats. But by eating too much trans fat will raise body cholesterol level.

Functions of Lipids

Lipids have many functions in functioning of body, some are as follows :-

① Lipids are storage compounds :-

① Lipids store in body and provide energy to body on need.

② Lipids are common storage of fat soluble vitamins like A, D, E, K.

② Lipids as Insulators :-

Lipids cover myelin sheath which help in ~~trans~~ travelling of nerve impulse.

③ Lipids help in metabolism :-

Some hormones like prostaglandin and steroid are lipids in nature which help in metabolism.

④ Lipids part of enzymes

Some ~~enz~~ lipids are part of enzymes which help in catalyzation of a process.

⑤ Form structure in body :-

Phospholipids are structural compounds of cell membrane in animals and plants.

(E) Protection of body organs

Fat layer in body help in organs protection like kidneys and heart.

(F) Regulation of Temperature

Fat layer is present below body skin layer this help in body's temperature regulation.

eg Fish :- Brown Fat layer is present which protect them from cold even in chilled water.

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

Energy Conservation

"Energy conservation means the use of energy in sustainable way as to conserve it for our future generations."

Energy conservation is one of SDG's which are to be met till 2030's.

Measures for Energy Conservation

There are few measures enlisted below to conserve energy :-

① Turn off unnecessary electrical appliances.

① Unnecessary electrical appliances means in households everyone should sit at one place and turn off the separate fans, A.C., lights etc.

② In Day light, there is no need of electric lights. so put them off.

② Everyone when go outside, he should be cautious to turn off fan, light etc.

② Prefer walk or cycle :-

Instead of using transport all the time, people should prefer walk or cycle.

Transport $\begin{cases} \text{either use Battery charge} \\ \text{or use fuel} \end{cases}$

Both are dangerous, as they damage atmosphere and consume more energy too.

③ Use alternate cooking methods:-

Cooking methods must be modified as in past household cooking was dependent on fossil fuels which polluted the atmosphere. But with advancement of technology, people are using electric kettles, electric stoves to cook food. Though it saves environment from pollution but consume more energy. So, find alternate way of cooking like solar pressure cookers.

④ Use energy-efficient appliances:-

Our good building codes and energy efficiency standards for consumer appliances sold on the market are not best in class and must be urgently revised to promote energy conservation.

5. Do household tasks manually:-

Household tasks like washings of clothes can be done manually. For example instead of using washing machine and drier machine, wash clothes manually and dry them in sunlight to conserve energy.

6. Replace incandescent bulbs with LED:-

The incandescent bulbs must be replaced with LED lights to save energy as the review has started but it need more comprehensive approach to accomplish the task.

7. Connect roof-top solar plates with batteries:-

The roof-top solar plates must be connected with batteries and grid station to store energy in day-light for its use after sunset.

8. ^{Give} General awareness to public about peak and non-peak tariffs :-

Peak tariffs → It is time at which energy consumption is maximum because demand of energy is high.

In ~~the~~ winter it ranges from 5-9 pm.

In summer, it ranges from 7-12 pm.

Non-peak tariffs :-

It is time at ~~at~~ of remaining day, when energy demand and consumption both are less.

It is a best way to save electricity bills.

Measures for sustainable usage of energy :-

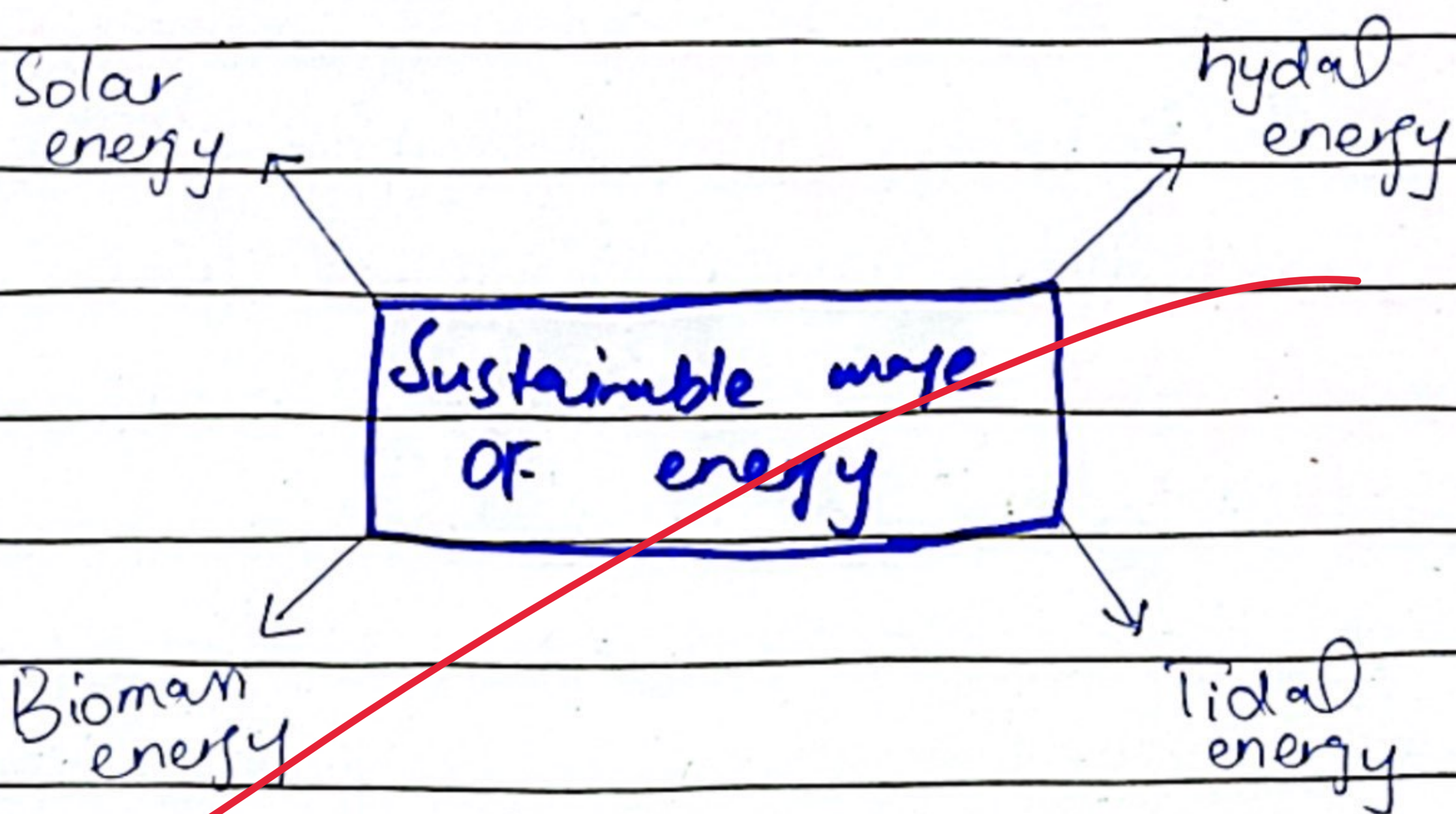
For sustainable usage of energy

we should move towards ~~non~~

renewable energy sources, to

conserve energy for our future

generations :-



For sustainable usage of energy, the current energy generating mechanisms should be shift to :-

Solar energy :-

Full fill energy requirements through sunlight. It is external source of energy till the last Day.

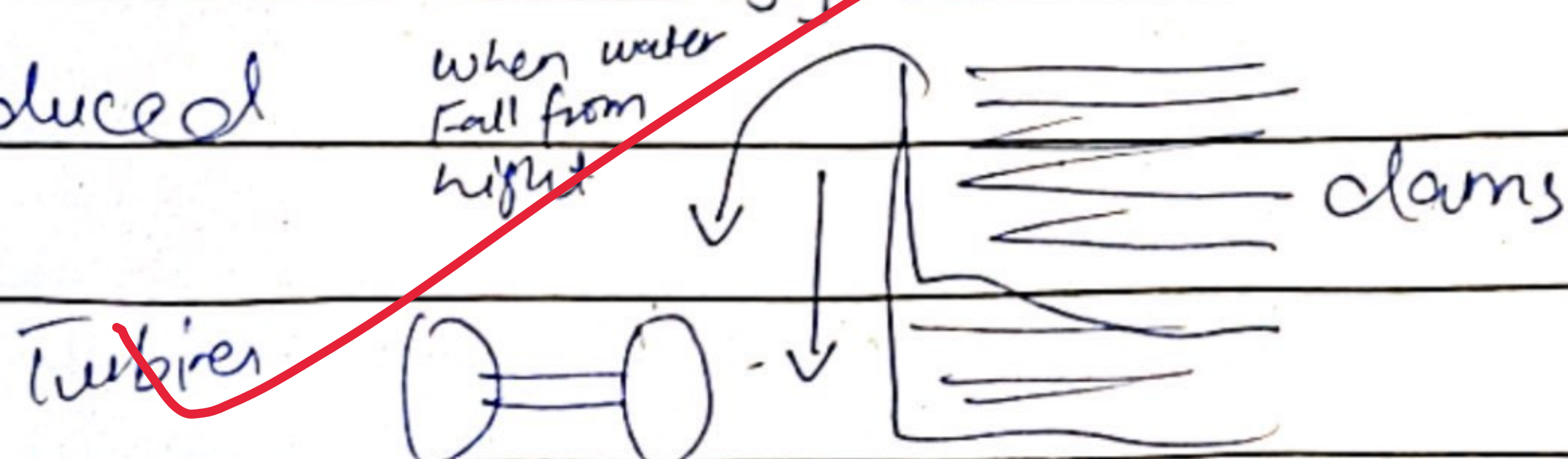
Advantage :-

- 1- It emits no pollution in atmosphere.
- 2- It is cheap in cost.

Hydal energy :-

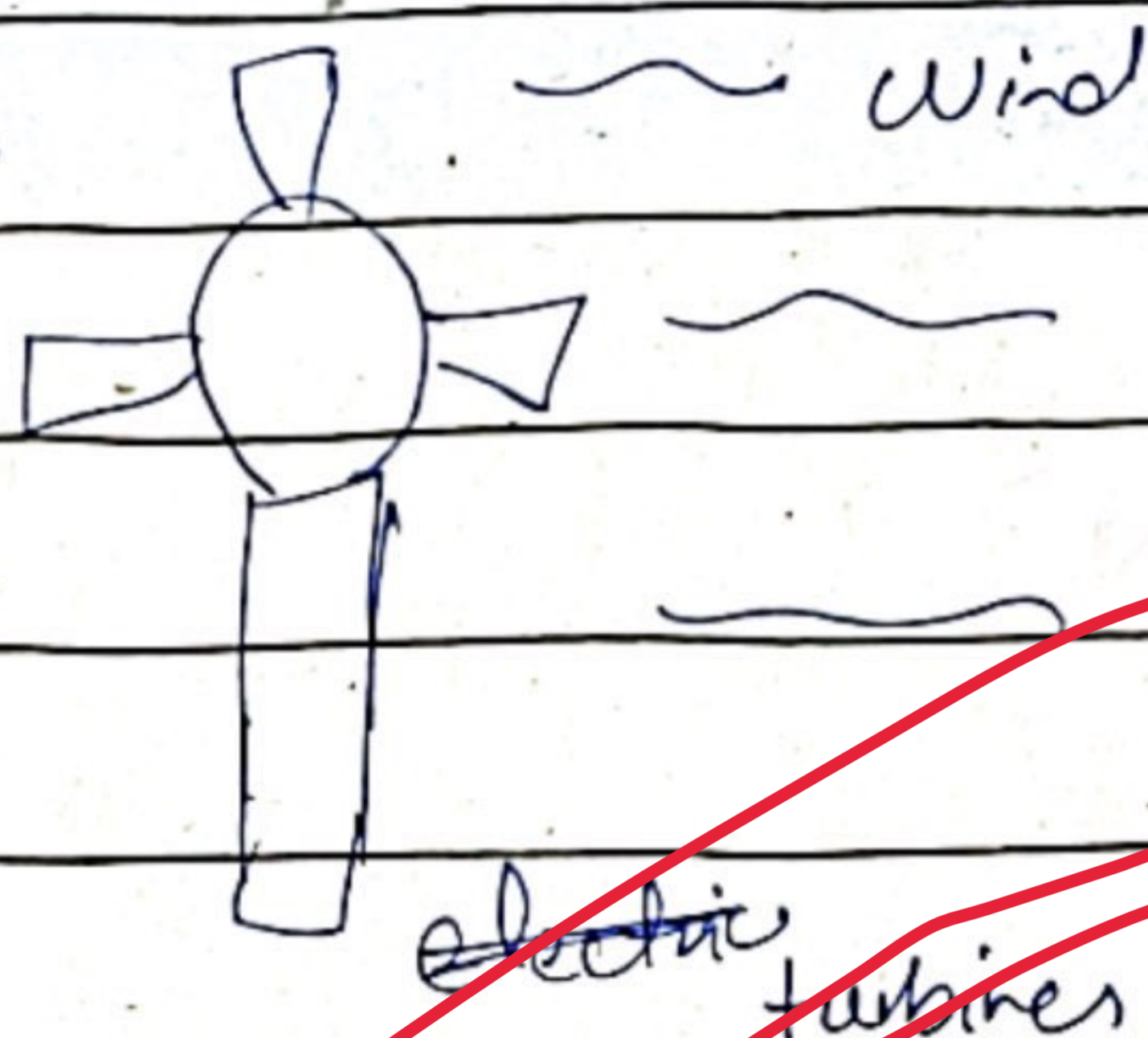
From water energy can be

produced



it release energy, which is used to run turbines and hence electricity is generated. This is renewable method and even free of cost to produce energy.

Tidal Energy :-



With wind these turbines move and generate electricity. This is one of the measure for sustainable usage of energy.

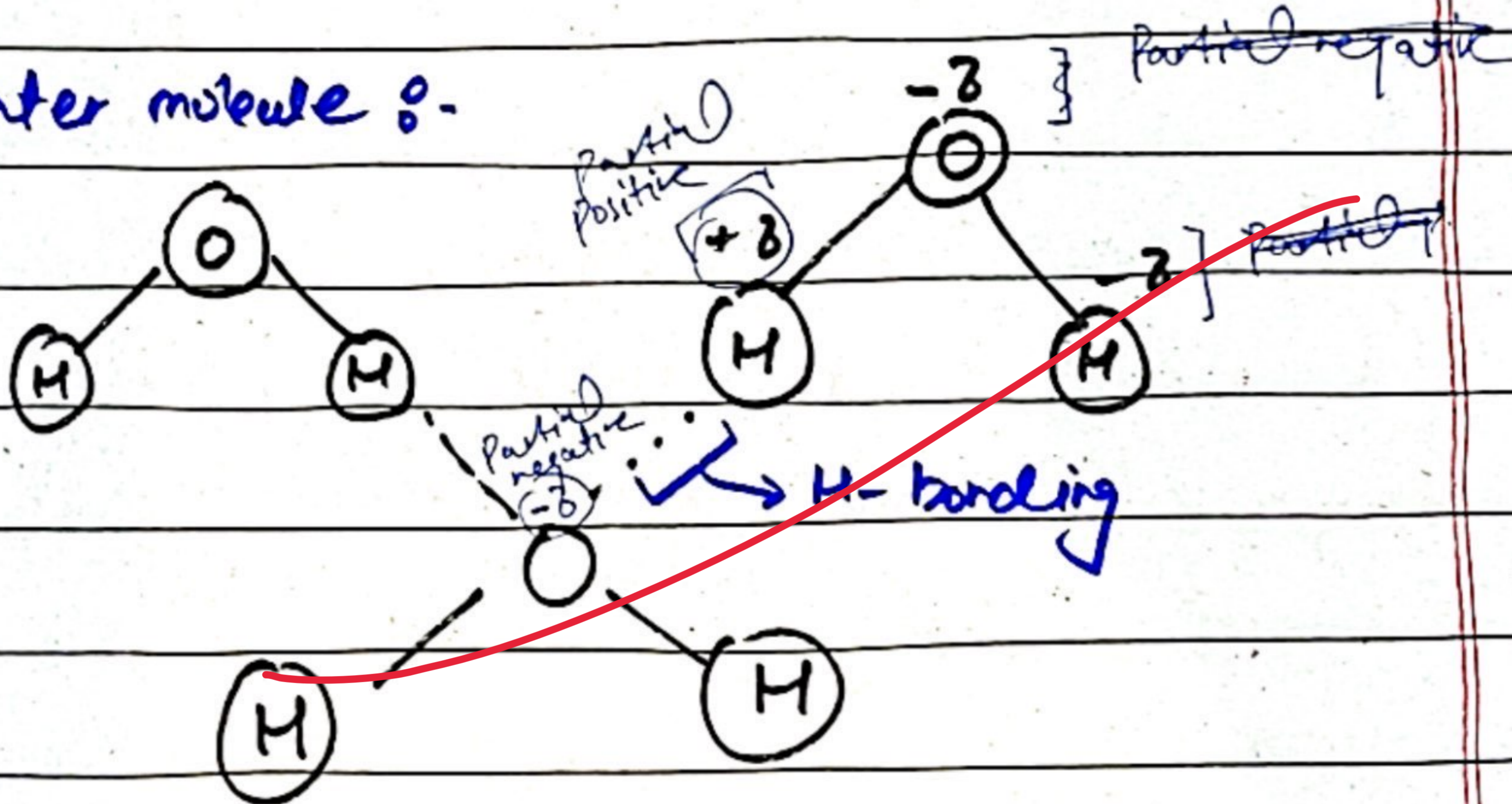
Biomass :-

Energy production from burning of biomass like animal waste, this is also one of the sustainable way to conserve energy.

(c) What is hydrogen bonding?
Give elaborating structures as examples.

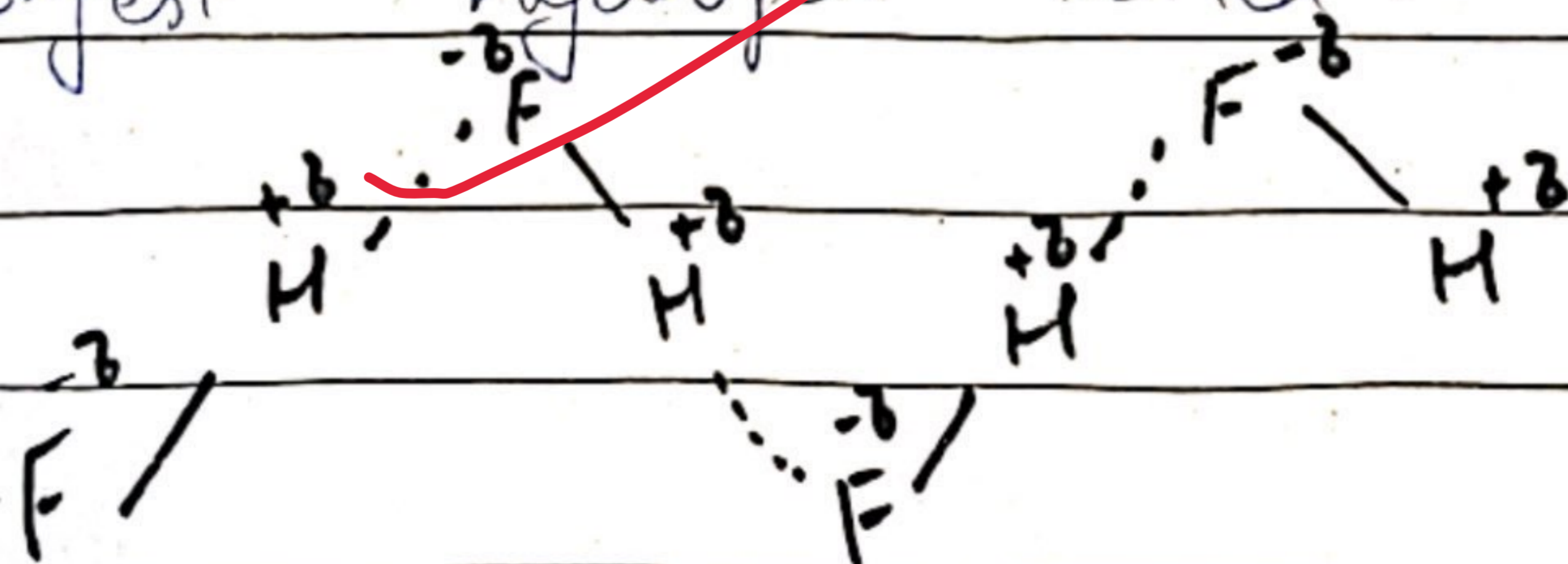
Hydrogen bonding is an intermolecular force that forms a dipole-dipole attraction when a hydrogen atom covalently bonded to a more electronegative atom such as O, N, F etc.

① Water molecule :-



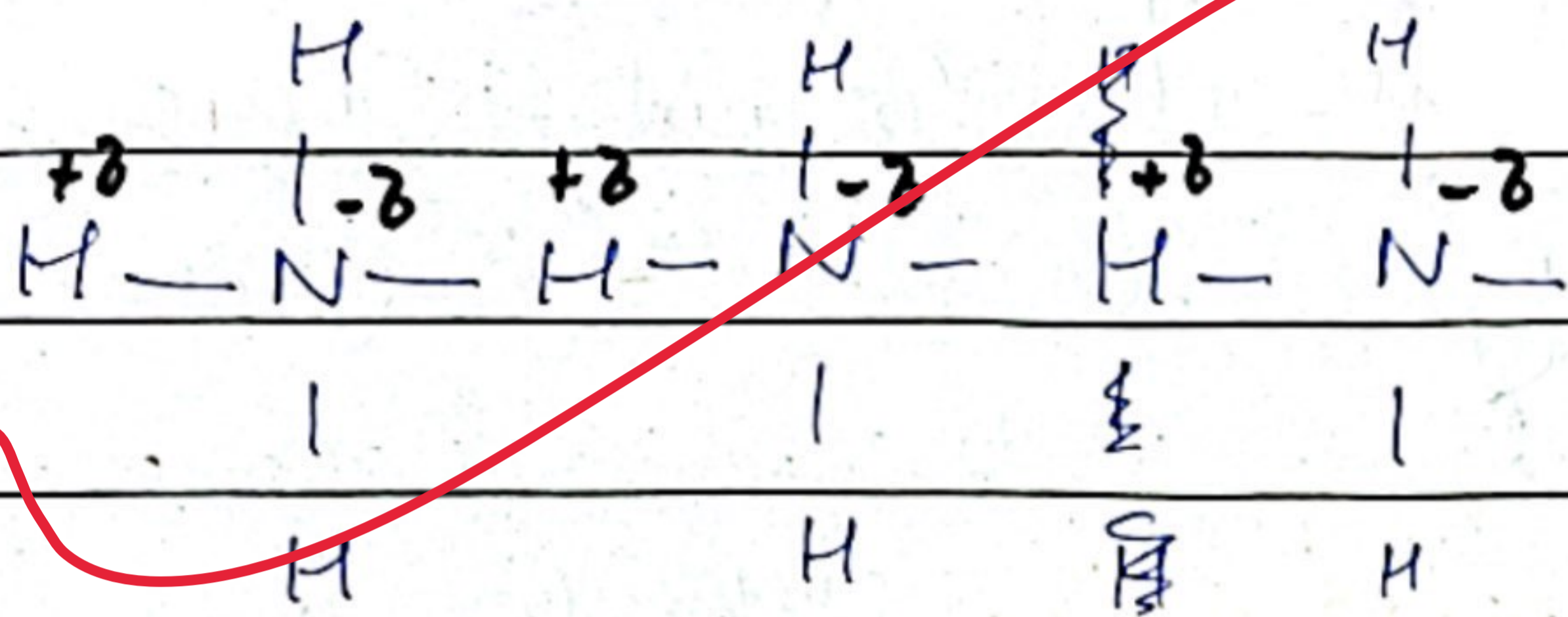
② H-Bonding in Hydrogen Fluoride :-

Fluorine having the highest value of electronegativity, forms the strongest hydrogen bond.



Hydrogen Bonding in Ammonia:-

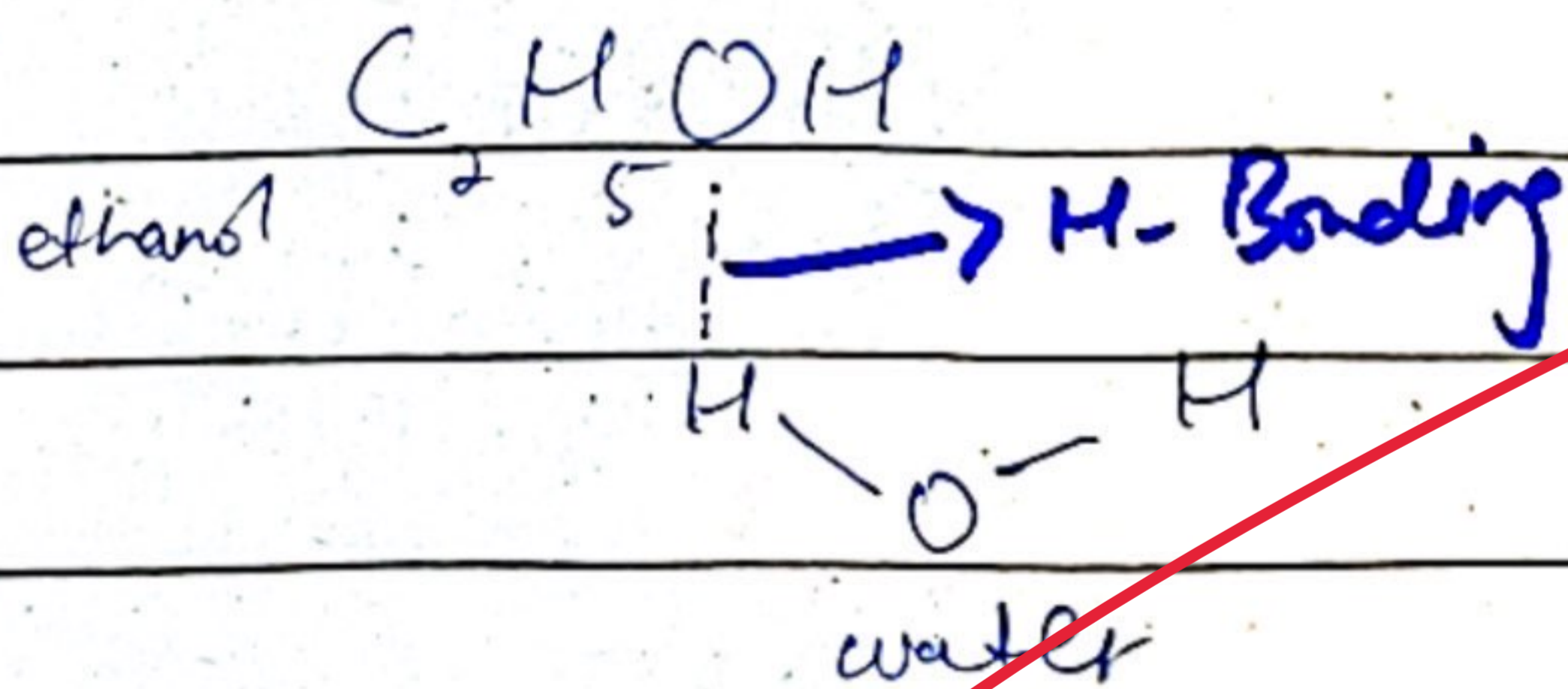
It contains highly electronegative atom nitrogen linked to hydrogen atoms.



Properties of Hydrogen Bonding:-

Solubility:-

Lower alcohols are soluble in water because of H-Bonding between water and alcohol.



Volatility:-

Compounds having H-Bonding have high volatility means boiling point than those who have no H-bonding.

Viscosity and Surface Tension :-

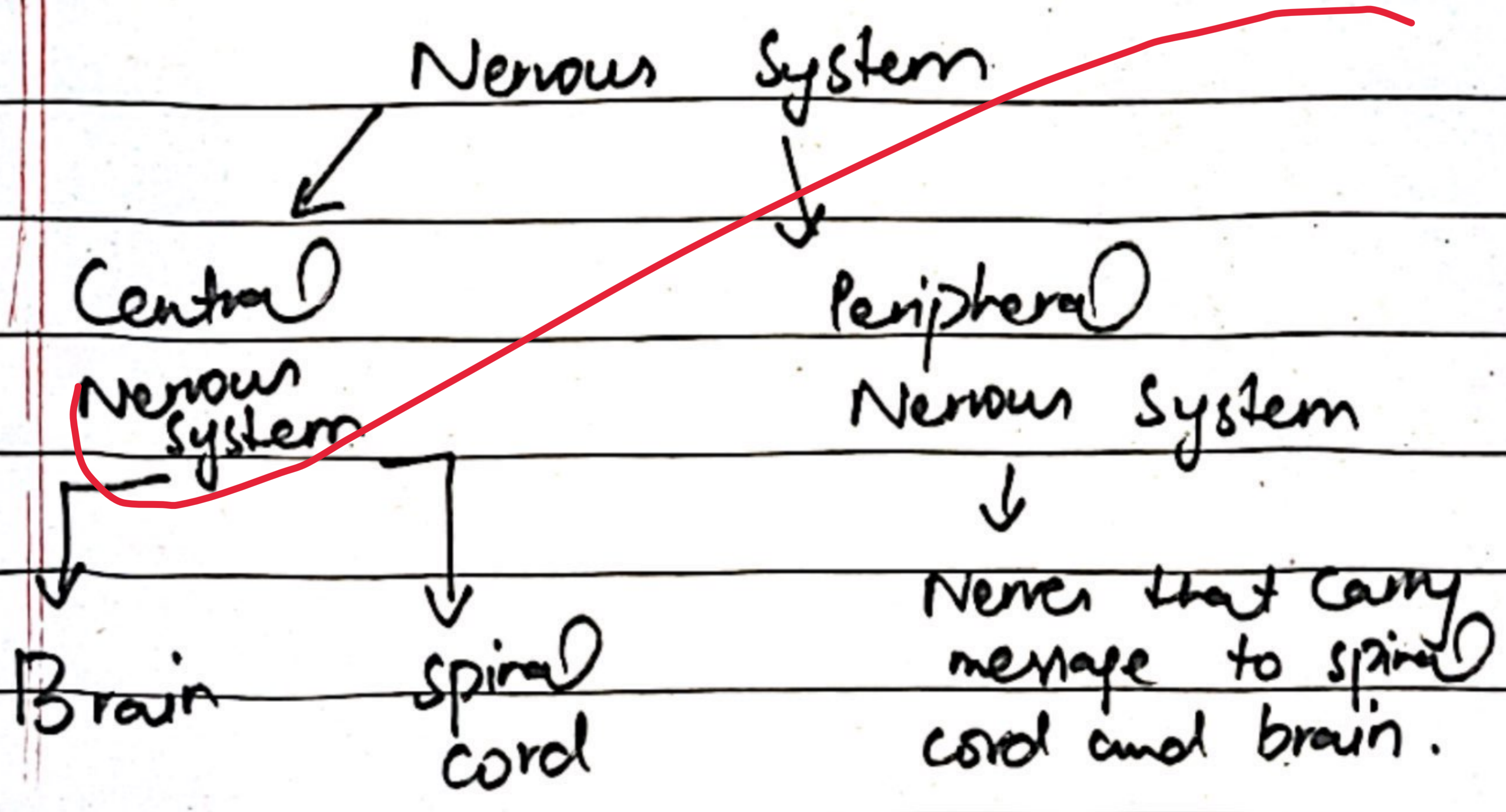
The compounds having H-bonding they have more surface tension and it is difficult to move them as compared to other compounds which do not have H-bonding.

Density :-

The density of molecules having H-bonding is high.

Let us compare density of ice and water. Ice floats on the surface of water because it has less density than water.

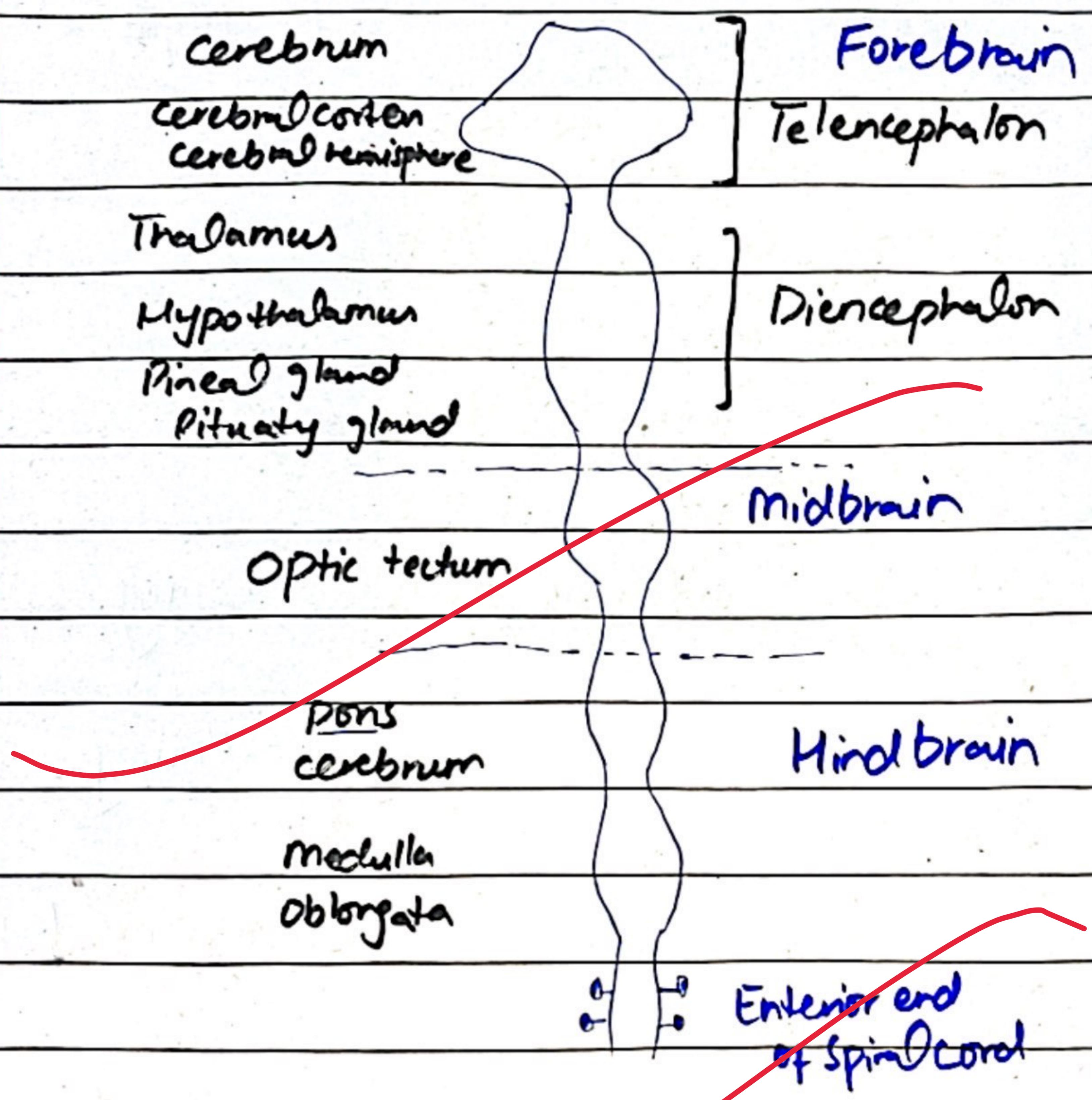
(d) Discuss the nervous structure of human body :-



Human Brain :-

Human Brain consists of three parts :-

- (1) Forebrain
- (2) Hindbrain
- (3) Mid brain



Cerebrum :-

It is divided into two hemispheres called cerebral hemispheres. The outermost part is called cerebral cortex.

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It is used in written and spoken forms in humans.

Thalamus :-

It relays all sensory information to higher brain centers.

Hypothalamus :-

It regulates body temperature, sexual drive, hunger and thirst.

Pineal gland

It controls body rhythms

Pituitary gland

It secretes hormones

Midbrain

It has functions in touch and hearing

Medulla Oblongata

It is helpful in breathing, swallowing.

Cerebellum

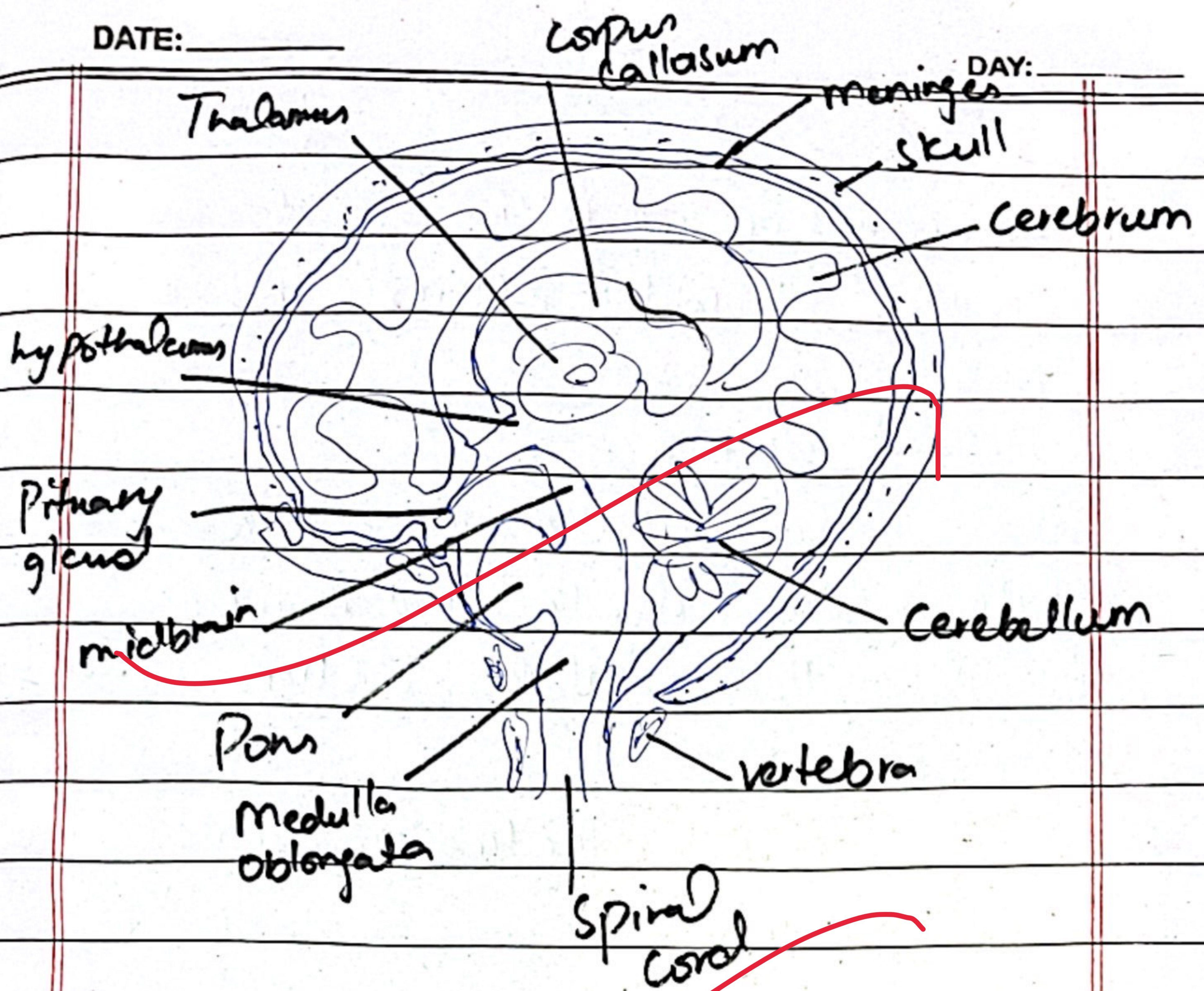
It is linked with limbic movement

Pons

It is a bridge that connects cerebellum with cerebrum.

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Human Brain

Spinal Cord

Functions :-

- ① It connects brain with all other parts of body.
- ② It controls spinal reflex action.

Its cross section has following parts :-

① Neural canal :-

It is present in the centre of spinal cord. It contains cerebrospinal fluid.

2. Gray matter:-

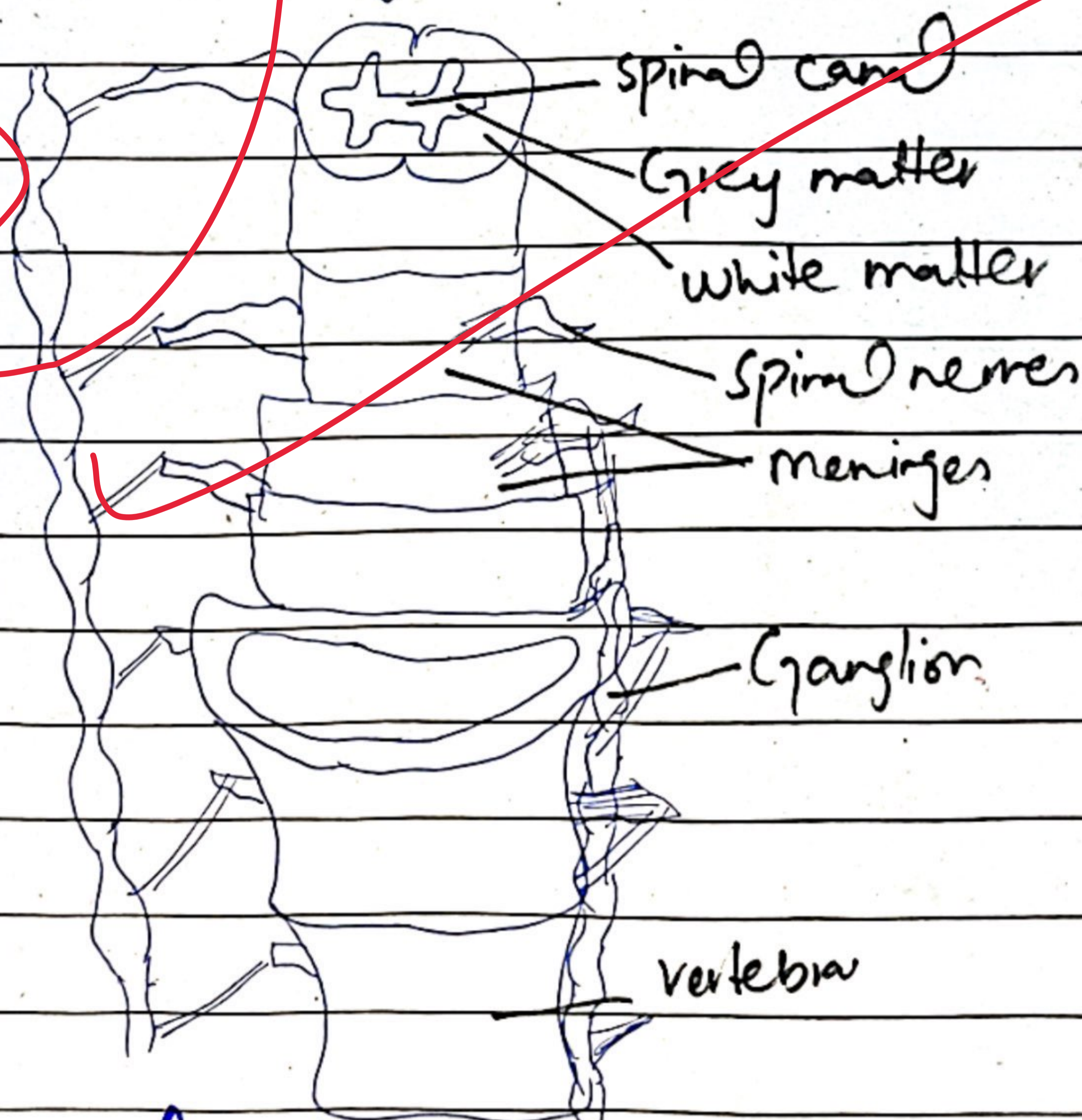
It consists of cell bodies and dendrites. It control reflexes in spinal cord.

3. White matter:

Its axons are covered with white myelin sheath that's why it is called white matter.

4. Meninges:

The layers of protective membranes called meninges.

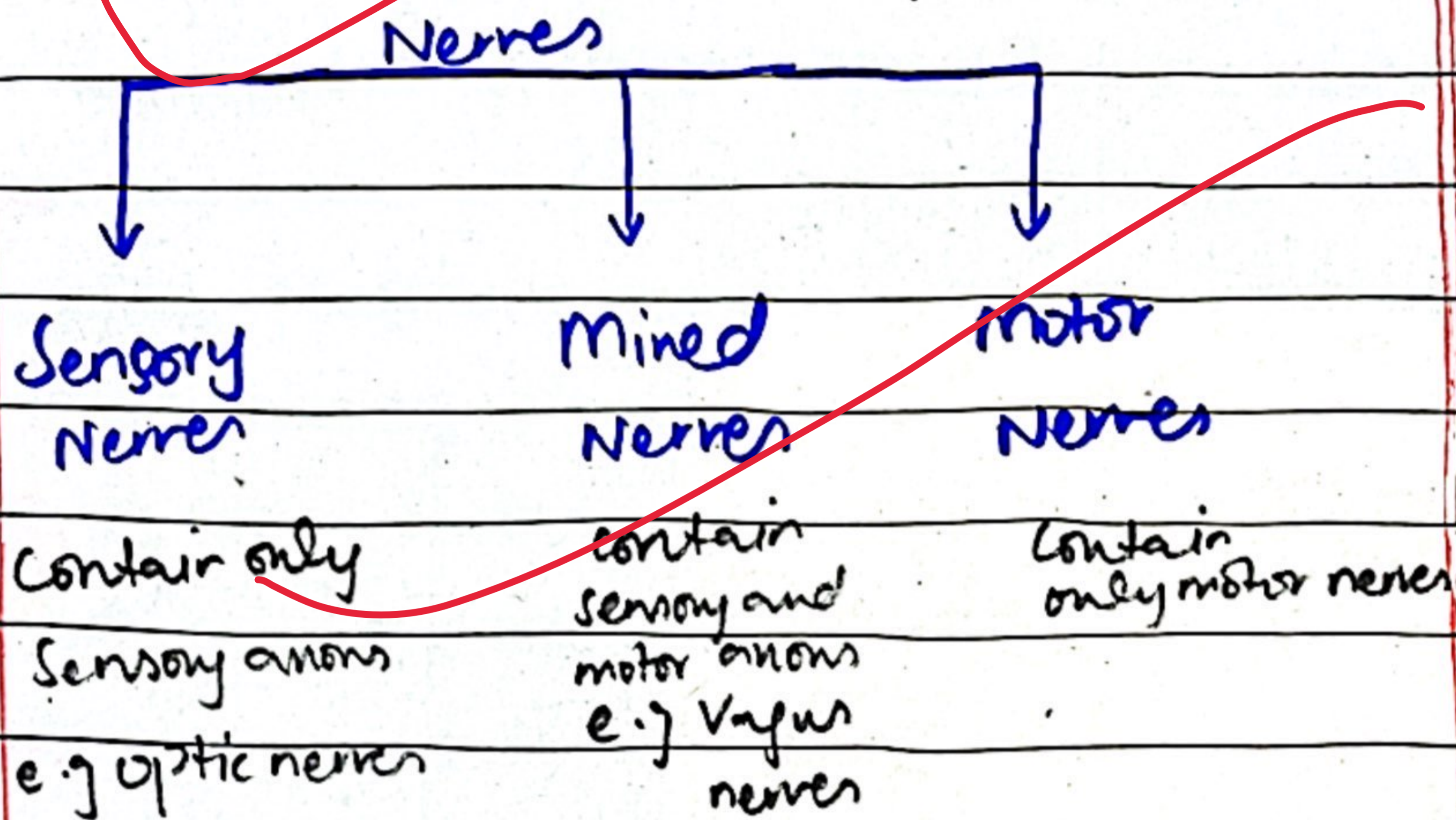


Spinal cord of Humans

Peripheral Nervous System :-

It consists of paired cranial nerves and spinal nerves.

There are three types of nerves :-



Q no. 4

(a) What is hepatitis? Explain its causes, symptoms and prevention.

Hepatitis :-

The viral infection of liver is called hepatitis.

Types of Hepatitis :-

There are different types of hepatitis, their causes, symptoms and prevention vary

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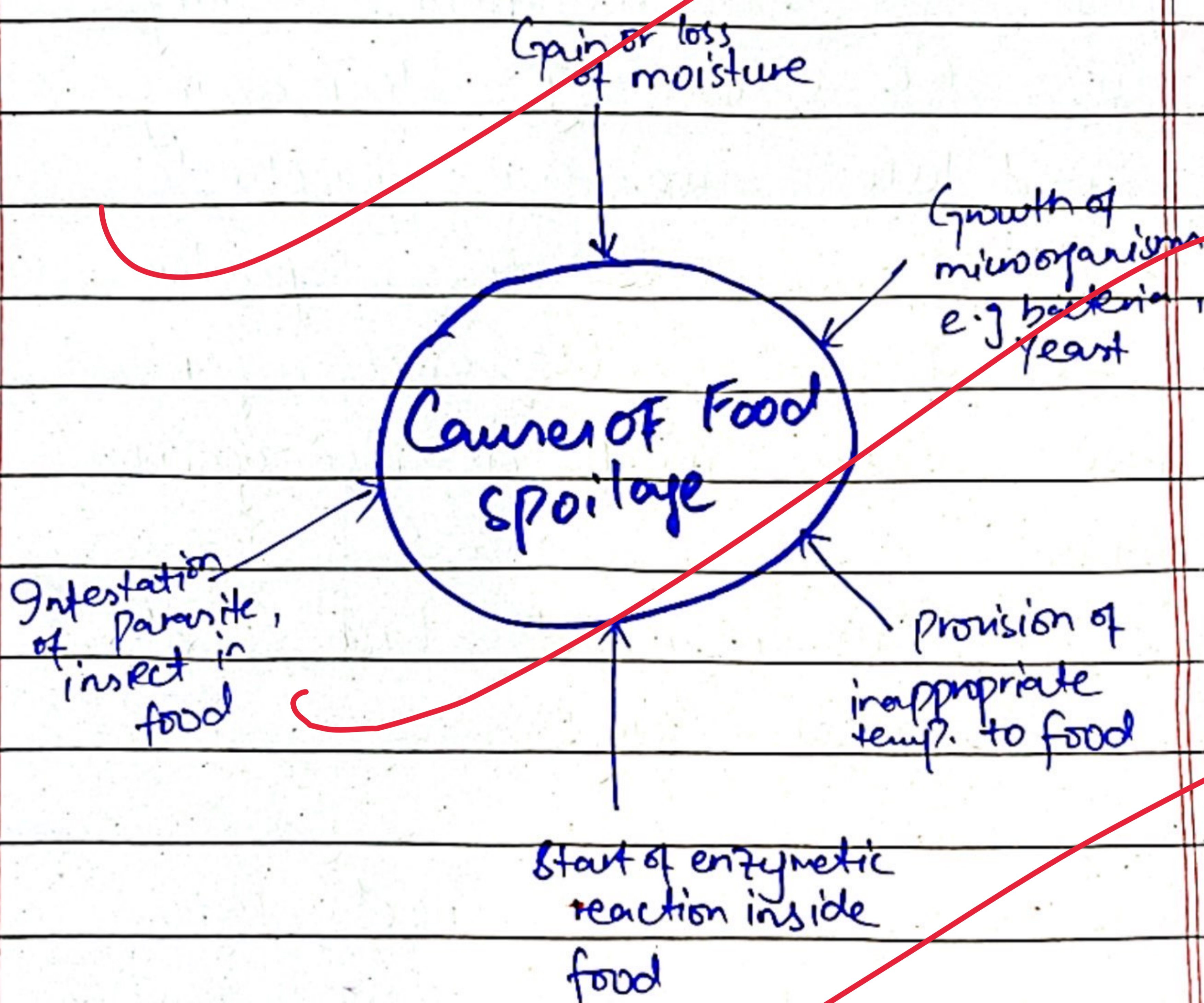
according to the type of hepatitis.

Hepatitis types	Causes	Symptoms	Prevention
Hepatitis A	contaminated water, food poor sanitation contact with infectious person	Vomiting Diarrhoea yellowing of skin and eyes	Vaccination is available Use safe water, food and improved sanitation
Hepatitis B	contact with blood of infected person, body fluid contaminated food and water from mother to child.	Vomiting, Diarrhoea Yellowing of skin	Vaccination is available Bed rest for patients. Avoid contact with contaminated syringes or blood.
Hepatitis C	Hepatitis C virus unsafe injection practices inadequate sterilization of medical equipment transfusion of unscreened blood	bleeding from body parts Tiredness Yellowing of skin	Antiviral drug therapies are available NO proper vaccination is available Its end stage is cirrhosis Liver transplantation

(b) Elaborate a few methods of Food preservation.

Food Preservation :-

Food preservation is any method by which food is kept after harvest or slaughter so that it does not spoil.



Methods for Preservation of Food :-

① Heat :-

Some food is preserved by boiling it at high temperature because at high temperature

Certain bacteria become inactive.

e.g. **Pasteurized milk**

It is pasturized by at 63°C for 30 min.

2. Cold :-

Most bacteria, yeast, molds

grow best at temperature range $16 - 36^{\circ}\text{C}$, So by decreasing

temperature, we can inactivate

them. Because at low temperature

water freezes, salts and sugar

also, so the growth of micro-organisms

stops.

e.g. Frozen meat, Fish and other things.

3. Drying :-

Sometimes food is dried in

the sunlight to remove excess

water from it, so the

micro-organisms growth stops

in it.

e.g. Mint is dried in sunlight

and can be used for

long time.

4. Acid :-

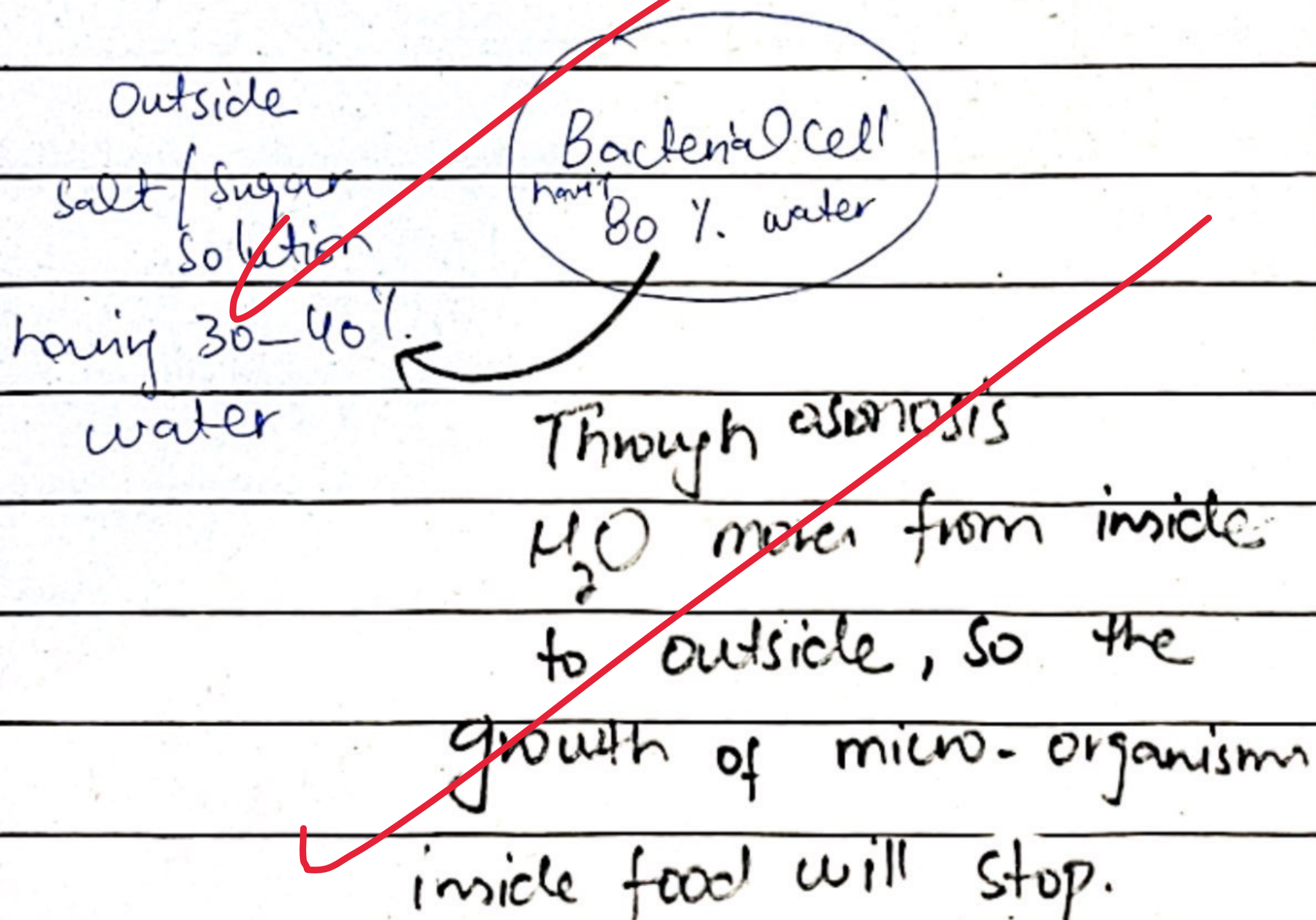
The addition of acid to food denatures the protein of food so the bacteria protein also becomes inactive.

example :

- ① Citric acid
- ② Phosphoric acid added to soft drinks.

5. Sugar and salt :-

Meat is preserved in salt brine, Fruit are preserved in sugar syrup.



6- Smoke :

Meat by providing smoke can be preserved from spoilage. In past this technique was efficiently used.

Smoke → Formaldehyde + Meat → Preservation of Food

7- Chemicals :

Chemicals like Sodium benzoate can be added in soft drinks and acidic foods to inhibit the growth of micro-organisms.

Sulphur dioxide control the browning of fruits and vegetables caused by enzymes.

8- Radiation :

Radiation like x-rays, ultraviolet radiations, microwaves, ionizing radiations can be used to inactivate enzyme that spoil food like vegetables.

e.g. Potato sprouting

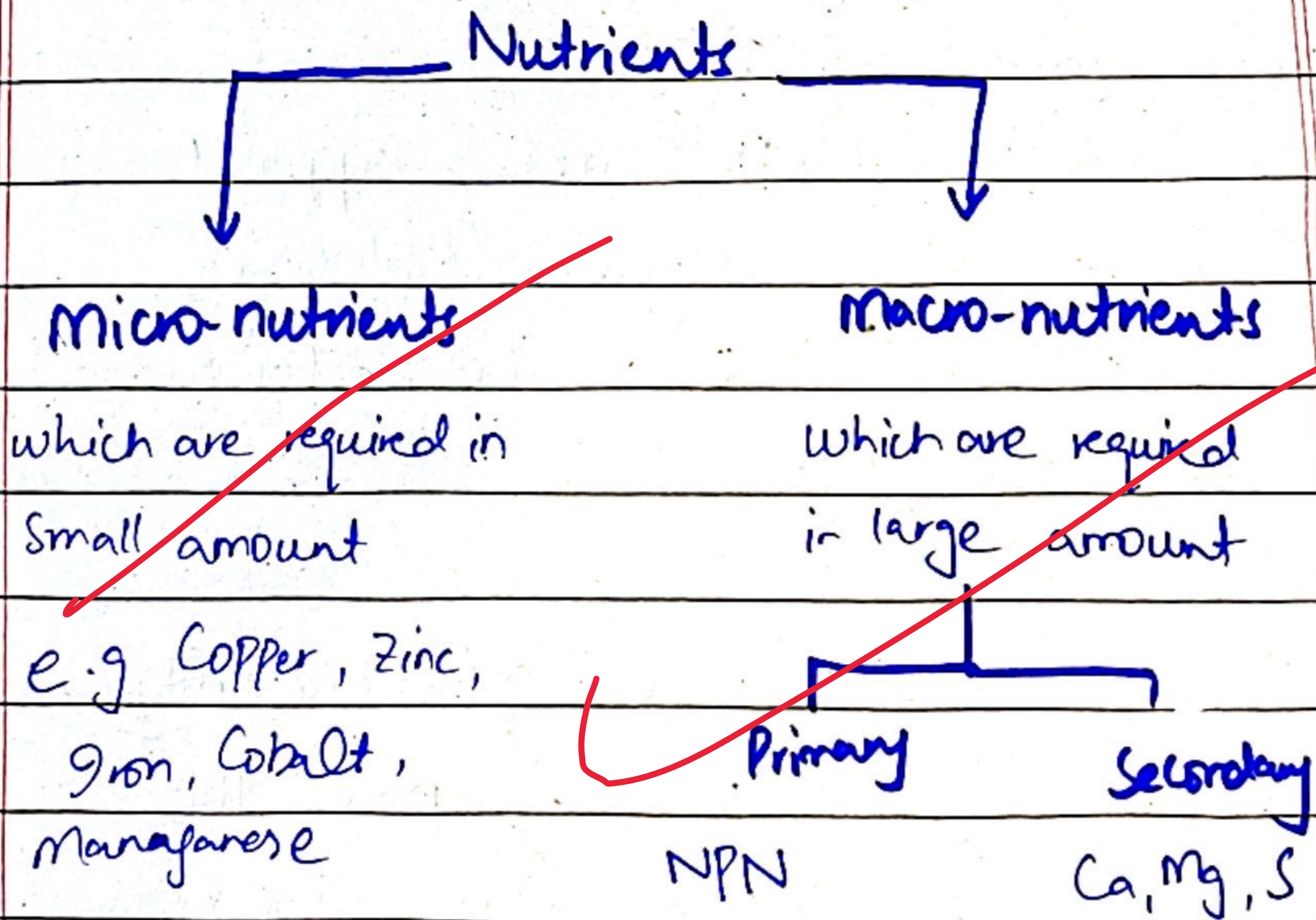
(C) Explain Fertilizers. What are their types.

Fertilizers :-

Fertilizers are organic or inorganic compounds which are naturally occurring or synthetic in nature having certain nutrients and apply to soil or plants to fulfill their nutrient requirements.

Types of nutrients :-

There are two types of nutrients :-



Classification of Fertilizers on the basis of their mode of application on soil :-

The classification is as follows :-

① Direct Fertilizers :-

These fertilizers are directly given to soil to fulfill its nutrient required. These are mineral salts

Example :-

Super phosphate

Nitrate

② Indirect Fertilizers :-

Fertilizers which are applied to soil to increase biological activities, mechanical and chemical resilience.

Example :-

Limestone CaCO_3 to reduce acidity

Gypsum \rightarrow to improve the

properties of soil having high salt content.

③ Complete Fertilizers :-

Those fertilizers which supply all ~~fert~~ nutrients to soil are called complete fertilizers.

Example :

Zorawar

Zarkhaiz Fertilizers.

④ Incomplete Fertilizers :-

Those fertilizers which provide only one or two nutrients and given to only specific part of soil are called incomplete fertilizers.

Example :

Potassium chloride

KCl

only K is primary nutrient and this fertilizer is given to certain soil.

⑤ Mixed Fertilizers :-

When fertilizer is mixed with other fertilizer and is given to soil it is called mixed fertilizer.

Example :-

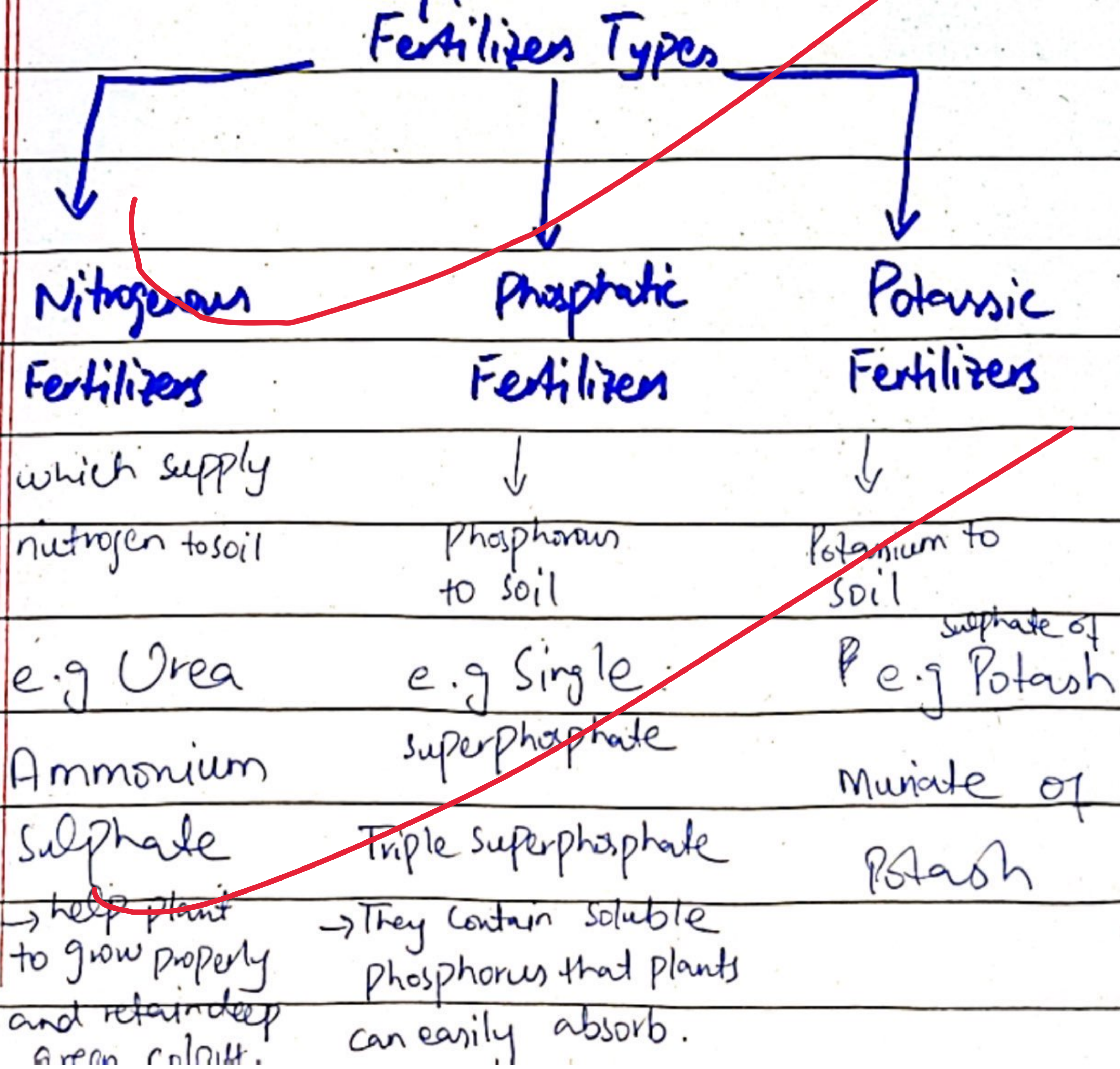
When urea is added to ^{single} superphosphate and potash it becomes mixed fertilizer.

⑥ Microfertilizer :-

These fertilizers have only one type of nutrients and given to soil.

Example :- Zinc, Copper fertilizer.

Types of Fertilizer on the basis of nutrient supplied :-



Sulphate of Potash :

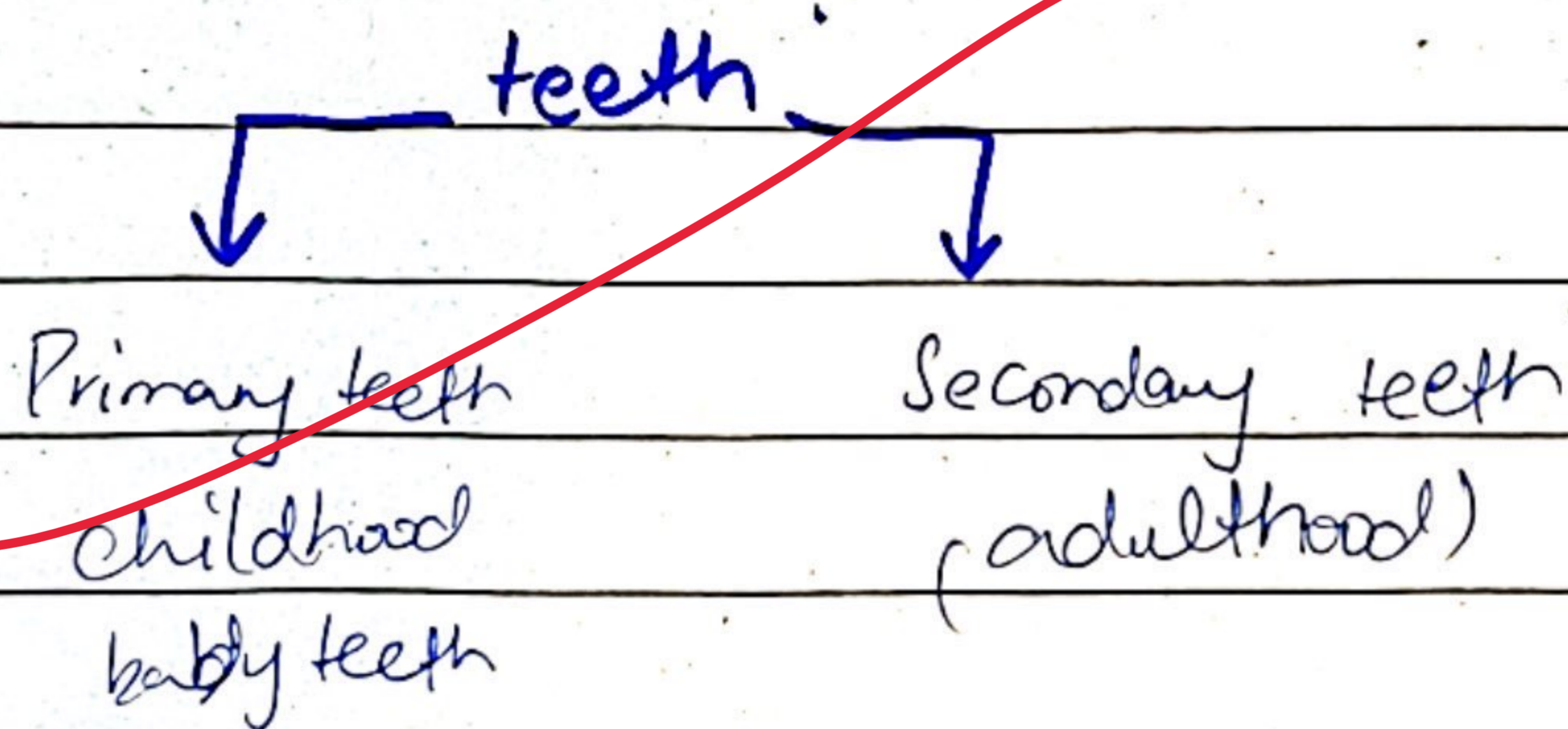
Great fertilizer apply in gardens, before and after winter.

- (1) To improve fruit taste
- (2) To improve flower colours.

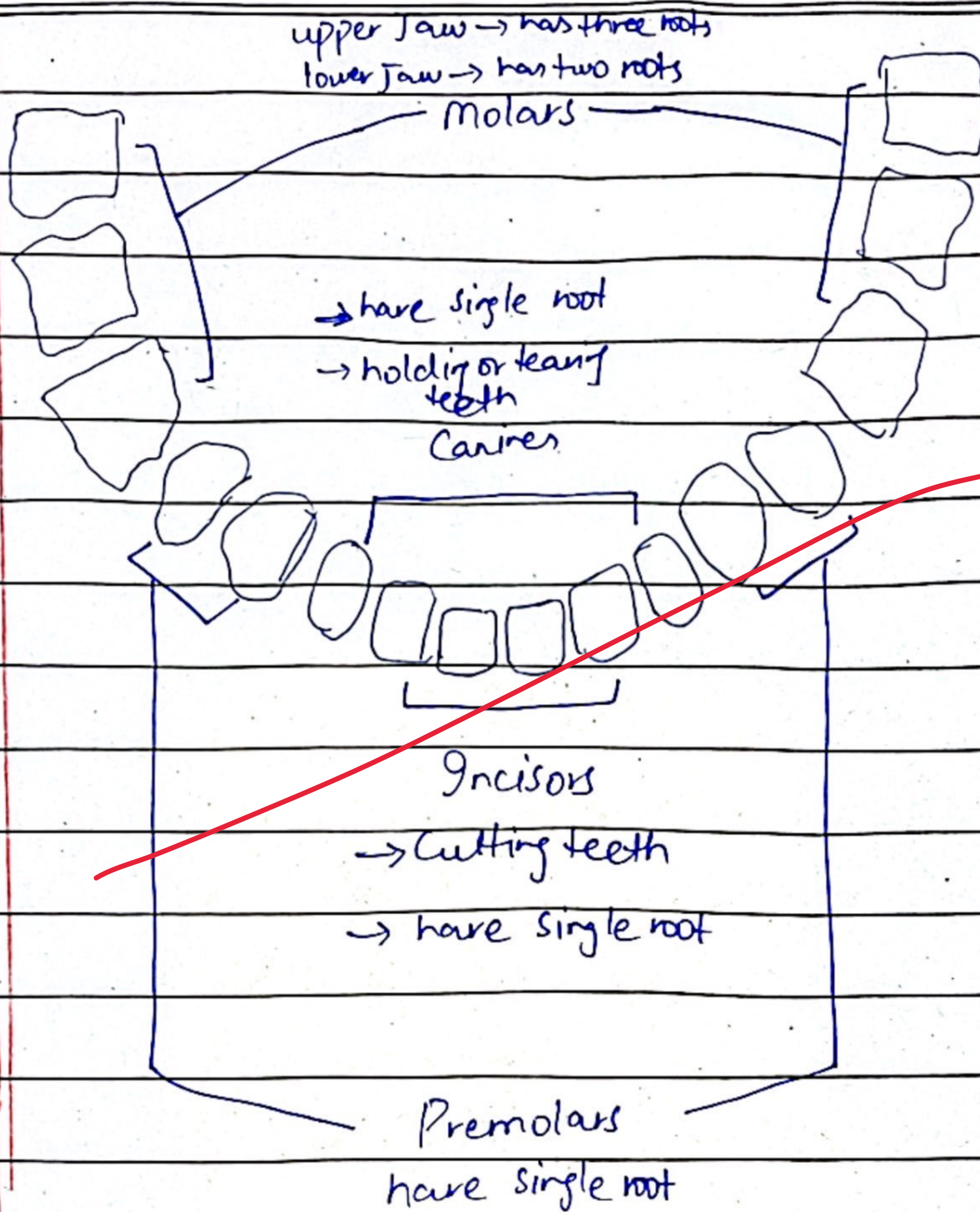
Muriate of Potash :

also called potassium chloride, it contains protein and sugar.

(d) what is the anatomy of human tooth?

Teeth types :-

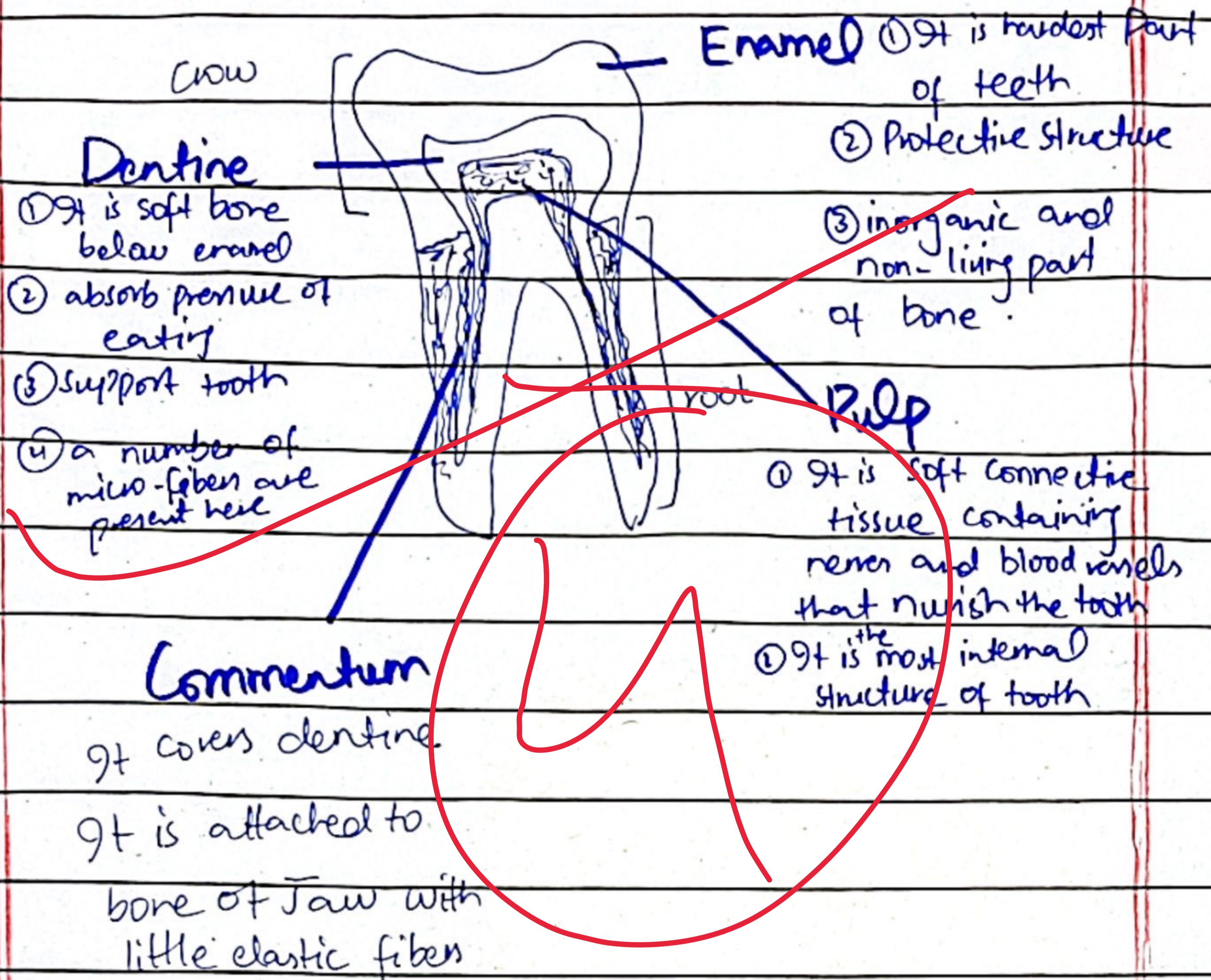
- (1) Incisors 8
- (2) Canines 4
- (3) Premolars 8
- (4) Molars 12



Anatomy of teeth :-

The structure of teeth has following parts :-

- ① Tooth Enamel
- ② Dentine or Ivory
- ③ Dental pulp
- ④ Cementum
- ⑤ Gums



Anatomy of human teeth

Section - II

(C) Solution :

Diameter of circle = 6cm

Circumference = ?

area = ?

As,

Circumference of circle = πd

$$= 3.14 \times 6$$

$$C = \boxed{18.84 \text{ cm}}$$

$$\begin{array}{r} 3.14 \\ \times 6 \\ \hline \end{array}$$

$$18.84$$

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$$\text{Area of circle} = \pi r^2$$

$$\text{as } r = \frac{d}{2}$$

$$d = 2r$$

$$= 3.14 \times \left(\frac{d}{2}\right)^2$$

$$= 3.14 \times \left(\frac{6}{2}\right)^2$$

$$= 3.14 \times \frac{36}{4}$$

$$\begin{array}{r} 3.14 \\ \times 9 \\ \hline 28.26 \end{array}$$

$$A = 28.26 \text{ cm}^2$$

(d) Identify the missing:

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

$$\begin{array}{cccccc} & \diagdown & & \diagup & & \diagdown & & \diagup \\ & 11 & & 22 & & 44 & & +88 \\ & & & & & & & +176 \end{array}$$

$$\begin{array}{r} 178 \\ +176 \\ \hline 354 \end{array}$$

So, the missing no. is 354.

(ii) 5, 6, 9, 14, 21, 30

$$\begin{array}{cccccc} & \diagdown & & \diagup & & \diagdown & & \diagup \\ & 1 & & 3 & & 5 & & +7 \\ & & & & & & & +9 \end{array}$$

So, the missing no. is 30.

(a)

Sum of 3-digit no. is 15

Sum of 10th and unit digit is 12

diff. of unit digit from 10th is 2

What is three digit no. = ?

Q87 (a) Distinguish I.Q and E.Q

I.Q

- I.Q measures intellectual skills
- like working memory, Analytical thinking, knowledge retention

I.Q Calculations:-

$$I.Q = \frac{\text{mental age}}{\text{Chronological age}} \times 100$$

Chronological age

e.g A person mental age

is 12 and he is

10 years old, it is

calculated as

$$I.Q = \frac{12}{10} \times 100$$

$$I.Q = 120$$

E.Q

- It refers to emotional abilities and social skills
- like regulation of interpersonal relations, empathising with others.
- It enable humans to identify biases.
- To cope with emerging technologies.
- E.Q enable persons to think beyond box.
- Emotional intelligence enhance over time.

(b) present age of Anum = ?
after 20 years

(c) Peter mow law = 40 min.

John = 60 min.

Total time = ?

$$= \frac{\text{total time}}{\text{no. of persons}}$$

$$= \frac{40 + 60}{2}$$

$$= \frac{100}{2}$$

$$= 50$$

$$= 50 \text{ min.}$$

Both will take 50 min. to mow
the lawn.

(d)

Let no. = x

when multiplied with $\frac{3}{5}$

$$x \times \frac{3}{5} = 0.6$$

$$\text{when } x \text{ with } \frac{5}{3} = 1.667$$

$$= 1.667 - 0.6$$

$$\text{Error} = 1$$

$$\begin{array}{r} 0.6 \\ 5 \overline{) 30} \\ \underline{30} \\ 0 \end{array}$$

$$\begin{array}{r} 1.667 \\ 3 \overline{) 5.0} \\ \underline{3} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

$$\begin{array}{r} 1.667 \\ \underline{0.6} \\ 1.0 \end{array}$$