



iOTA

Life Process

Hand Written Notes

CLASS 10 BIOLOGY

LIFE PROCESSES

FULL CHAPTER

PDF



iOTA Classes



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Life Process



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Life Process →

The basic and essential activities performed by a living organism to sustain and maintain life.

Nutrition →

Process of obtaining and utilisation of food.

2 Wednesday

Respiration →

Process of breaking down the food to produce energy.

Transportation →

Process of transporting useful and non useful substances from one part to another part of the organism.

Excretion →

Process of removal of metabolic waste.



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1. Nutrition...

↳ Autotrophic Nutrition →

Organism prepare their own food, from inorganic thing.

↳ There are two types of autotrophic nutrition.

(i) Photo Autotrophic Nutrition.

- Utilise light energy to prepare food.
- Examples - Green plants, cyanobacteria (Blue Green Algae).

4 Friday

(ii) Chemo Autotrophic Nutrition.

- Utilise chemical energy to prepare food.
- Examples - Some bacteria, Nitrosomonas, Nitrobacter.



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→ Heterotrophic Nutrition →

Organism depend on others to fulfill for their food, from organic thing.

→ There are three types of heterotrophic nutrition.

(i) Holozoic Nutrition.

- Organism feed by ingesting whole food material.
- Food is digested and absorbed inside the animal body.

6 Sunday

- * Examples - Human, cow, dog, amoeba, paramecium.

(ii) Saprotrophic Nutrition. *

- Organism feed on dead and decaying matter.
- *** Food is digested externally and then ~~nutrients~~ nutrients are absorbed.
- * Examples - Bread mould, yeast, mushroom.



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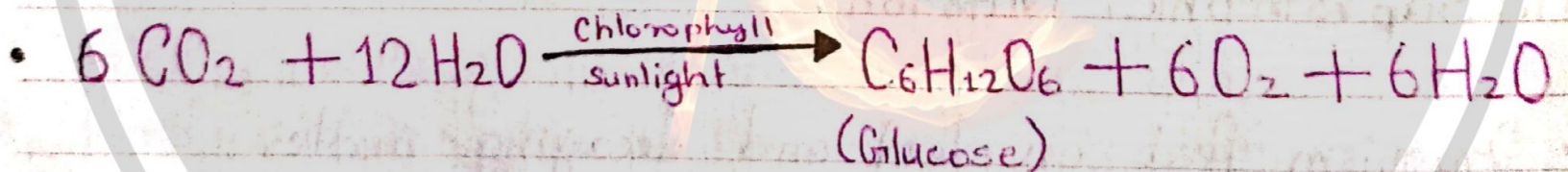
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(iii) Parasitic Nutrition.

- Organism derive nutrition from plants or animals without killing them.
- Obtain nutrition by living on or inside the host.
- * Examples - ~~For~~ Tapeworm, lice, leech, cuscuta, Ascaris.

Date = 03-04-2025

8 Tuesday Photosynthetic Autotrophic Nutrition in Plants.....



- MPIN → Magnesium, Phosphorus, Iron, Nitrogen are the other raw materials used by the plant.



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• Mechanism of Photosynthesis.....

- ① Absorption of light energy by chlorophyll.
(Sunlight)
- ② Conversion of light energy to chemical^(ATP) energy and splitting of water molecules into hydrogen and oxygen.
[light energy]
- ③ Reduction of carbon dioxide to carbohydrates. [dark energy]

Date = 04-04-2021

- When the water molecules of leave leaf are break down due to sunlight, then this step is known as photolysis of water.
- 10 Thursday
- ~~Glucose~~ Glucose are store in the plant in the form of starch.
- Animals store glucose in the form of glycogen.



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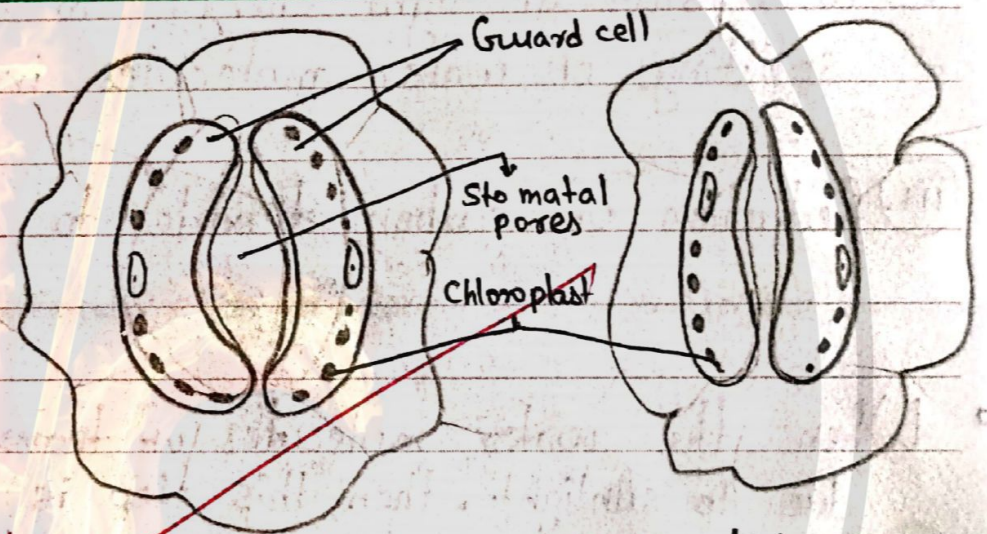
11 Friday

Stomata...

- These are tiny/microscopic pores like structure present on surface of leaves.

Role of stomata.

- ① Exchange of gases
- ② Transpiration

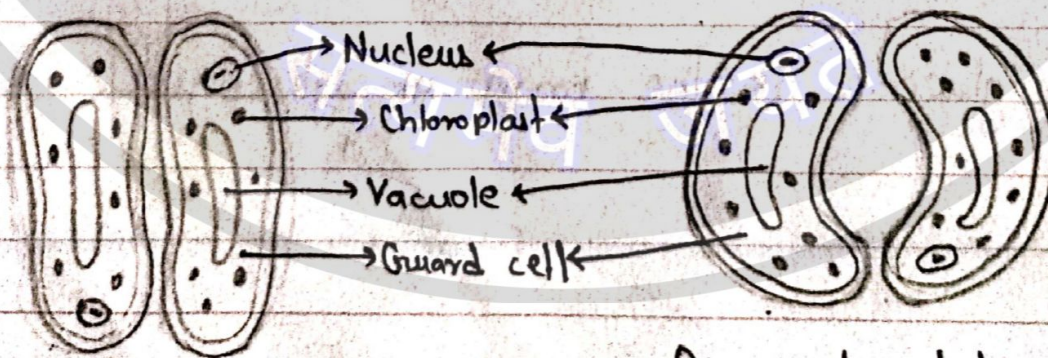


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(a) Open stomatal pore

(b) Closed stomatal pore

Opening and closing of stomata.



closed stomatal pore

Open stomatal pore



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- When water enters in the Guard cell then guard cell swell and stomatal pore opens.
- When water exit from the Guard cell the guard cell shrink and stomatal pore closed.

Photosynthesis in Desert Plants (Xerophytes).

Night
Stomata
open



Day
Stomata
closed

14 Monday

Malic Acid
{Intermediate compound}
↓
Glucose
{food}

Malic Acid $\rightarrow$ $\text{CO}_2 + \text{H}_2\text{O}$

★ The process when the leaves loses their H_2O (water vapour) and O_2 is known as transpiration.



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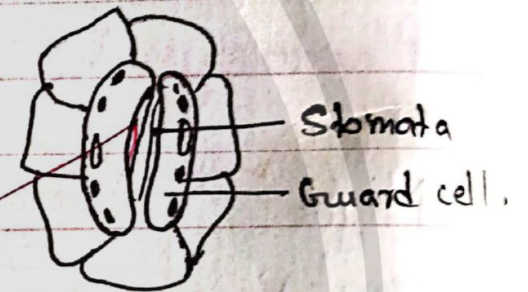
15 Tuesday

Ques.1. Opening and Closing of stomata is due to, *

Ans → ~~Mon~~ Movement of water in and out of the guard cell.

Ques.2. Which one of the following conditions is true for the state of stomata of a green leaf shown in the given diagram?

Ans. → Large amount of water flows out from the guard cell.



16 Wednesday

★ Points to be Noted or Remember,

- (i) During Photosynthesis, Oxygen is released due to splitting of water,
- (ii) In plants glucose is stored in the form of starch.
- (iii) In human beings glucose is stored in the form of glycogen.
- (iv) Opening & closing of stomata is controlled by guard cells and dependent on water in guard cells.

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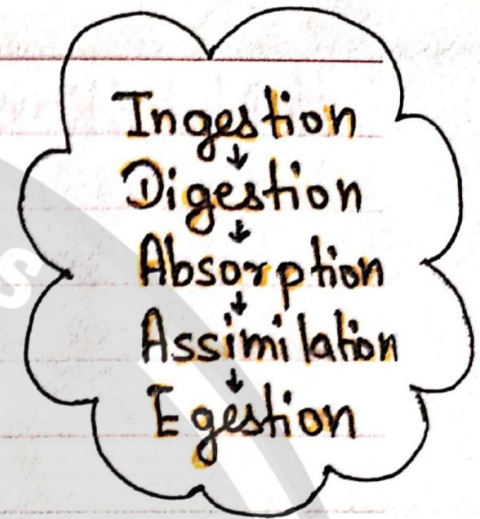


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21 Monday

Holozoic Nutrition ...

Nutrition in Amoeba



Amoeba → Pseudopodia (false feet)
extension of cell membrane

↓
Capture food

↓
Take in [food vacuole]

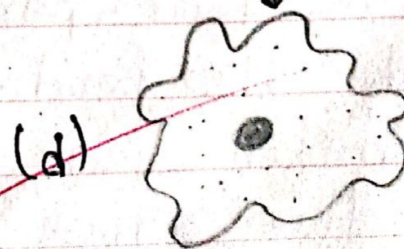
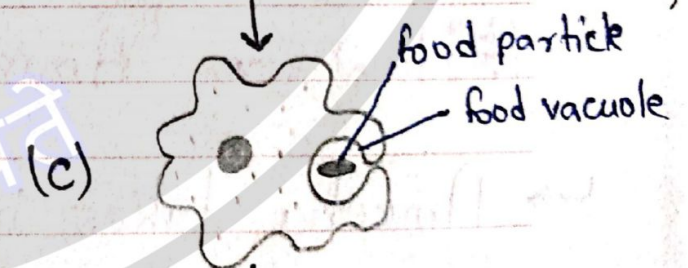
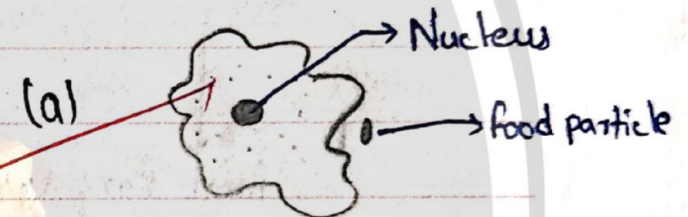
Diffusion of
simple substances
in cytoplasm

↓
Digestion of food
in food vacuole

22 Tuesday

↓
Undigested food

↓
move to surface of
cell and is thrown
out.



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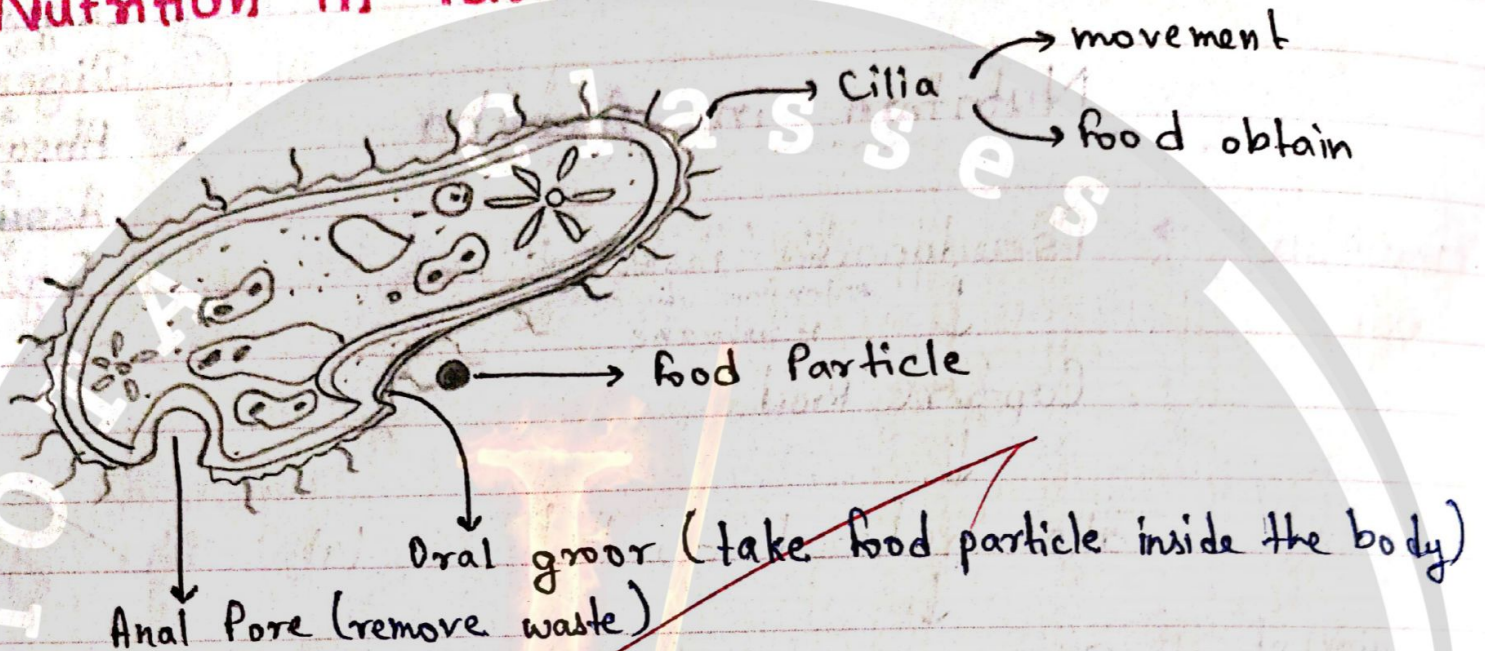
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23 Wednesday

Nutrition in Paramecium.



24 Thursday

How do Amoeba obtain their Nutrition?

→ Amoeba takes in food using temporary finger-like extensions of the cell surface which fuse over the food-particle forming a food-vacuole. Inside the food-vacuole, complex substances are broken down into simpler ~~once~~ ones which then diffuse into the cytoplasm. The remaining undigested material is moved to the surface of the cell and thrown out.





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* In Plants,
Nitrogen is an essential element used in the synthesis of proteins and other compounds and this is taken up in the form of inorganic ~~no~~ nitrates or nitrites.

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Question. Why simple diffusion method is insufficient to meet O_2 requirement in multicellular organism?

Answer → Simple diffusion method is insufficient to meet the O_2 requirements of multicellular organism because many cells within the body of multicellular organism are not in direct contact with environment and oxygen transport is slow.

Question. What criteria do we use to decide whether something is alive?

Answer → To determine if something is alive, we look for characteristics like life process, cellular organization, and the ability to adapt and respond to the environment. Any visible movement of something is also help us to decide whether it is alive or not. These processes can also occur at a molecular level.

Question. What are outside raw materials used for by an organism?

Answer → Organism need Oxygen, water and food from outside as a raw materials. Plants



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also use sunlight and Carbon dioxide from the outside environment as a raw materials.

Question. What process would you consider essential for maintaining life?

Answer → The essential processes for maintaining life include nutrition, respiration, transportation and excretion. These processes are fundamental for the survival of life.

2 Saturday

Question. Why does the leaves have the maximum stomata on the inner part surface?

Answer → The leaves have the maximum stomata on the inner surface to prevent the loss of water vapour (H_2O).

Question. What are the raw materials used by the Plants to make food?

Answer → H_2O , CO_2 and light (heat) are used by the plants to make their food.



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- Water moves from a region of higher concentration (soil) to the region of lower concentration (root) by the process of osmosis.
- Elements dissolved in water also moves from the region of higher concentration (soil) to the region of lower concentration (root) by the process of diffusion.
- Inside root water concentration and elements concentration is low.

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Due to 'concentration gradient' elements move from soil to roots.

No energy is required for movement of water as well as other materials from soil to root.



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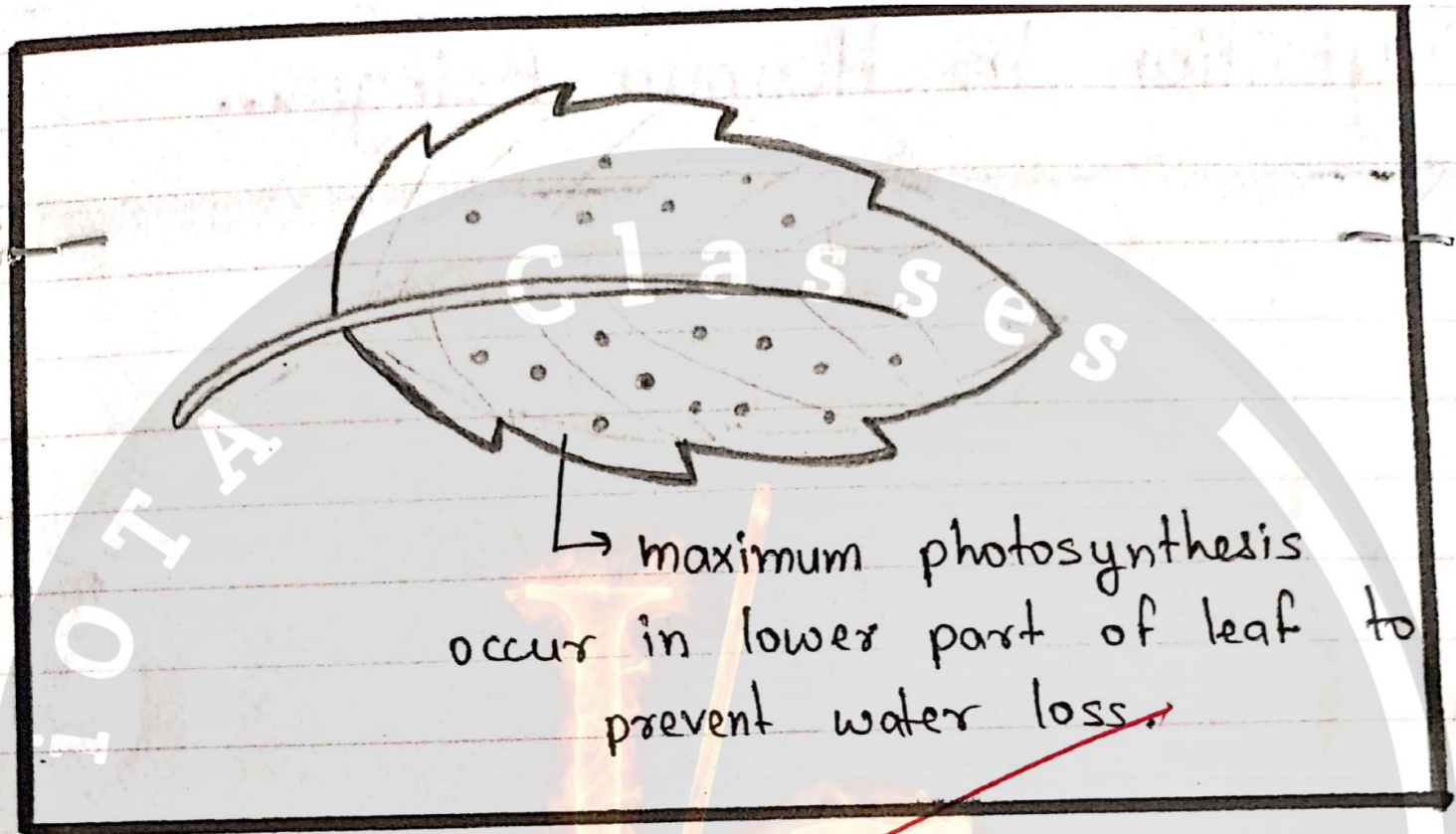
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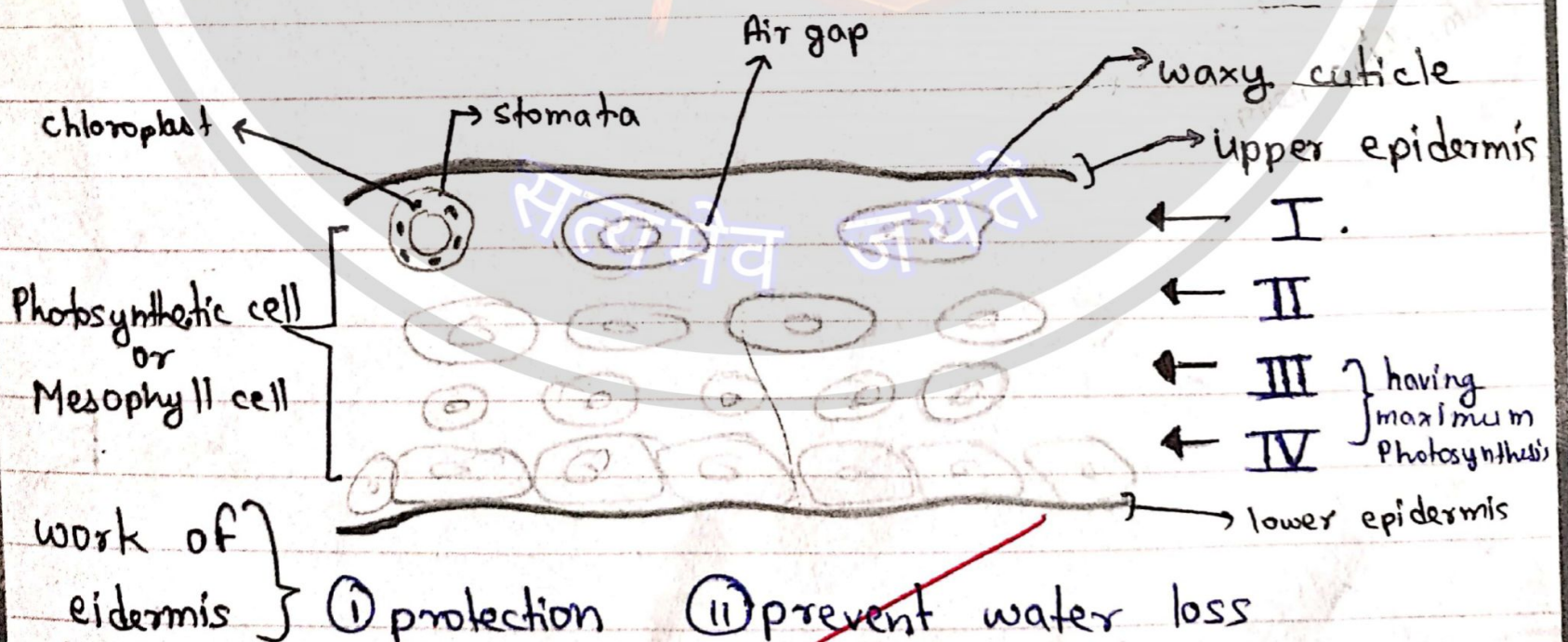


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• Cross section diagram of leaf...



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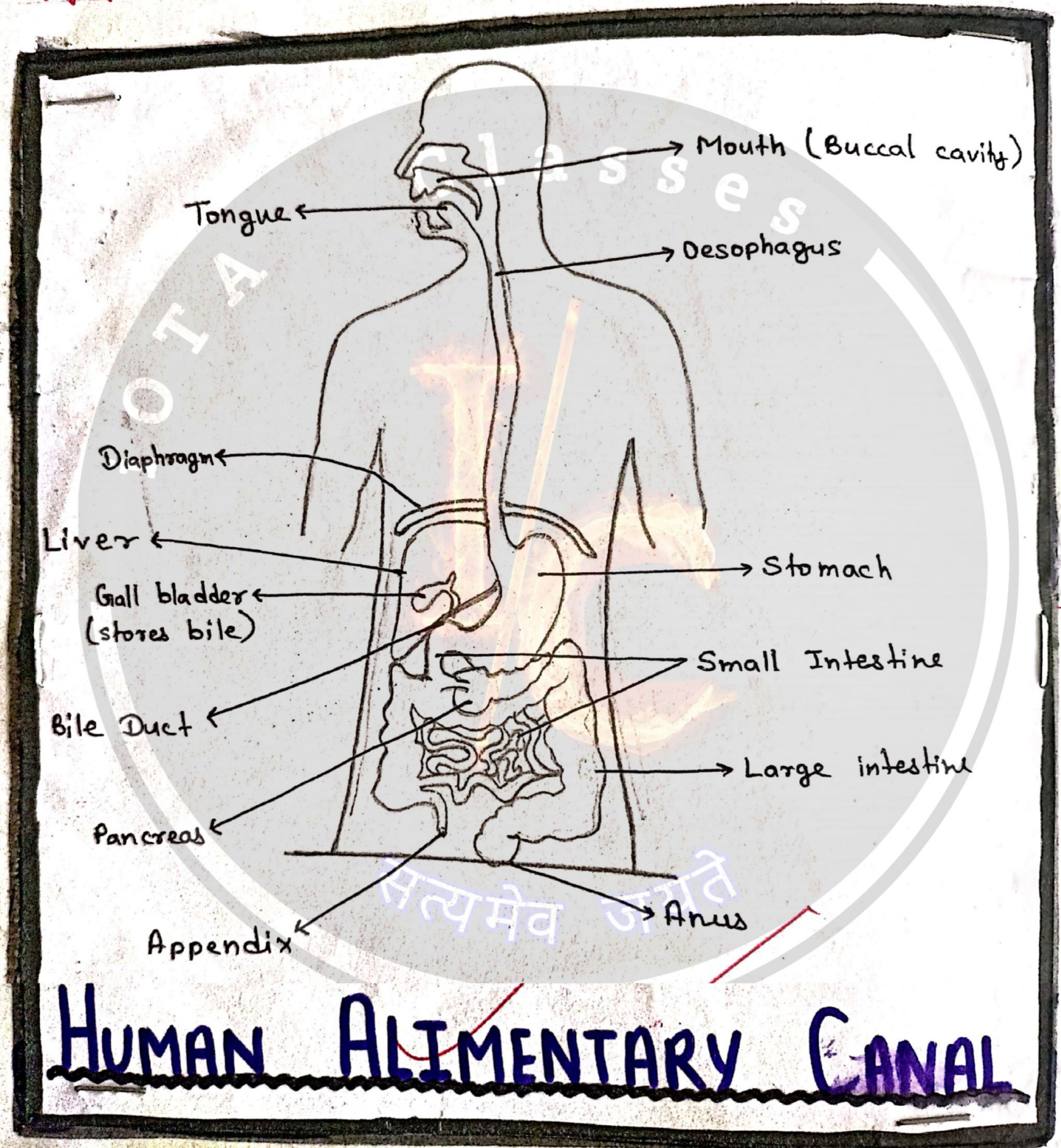
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Nutrition in Human Beings...



HUMAN ALIMENTARY CANAL



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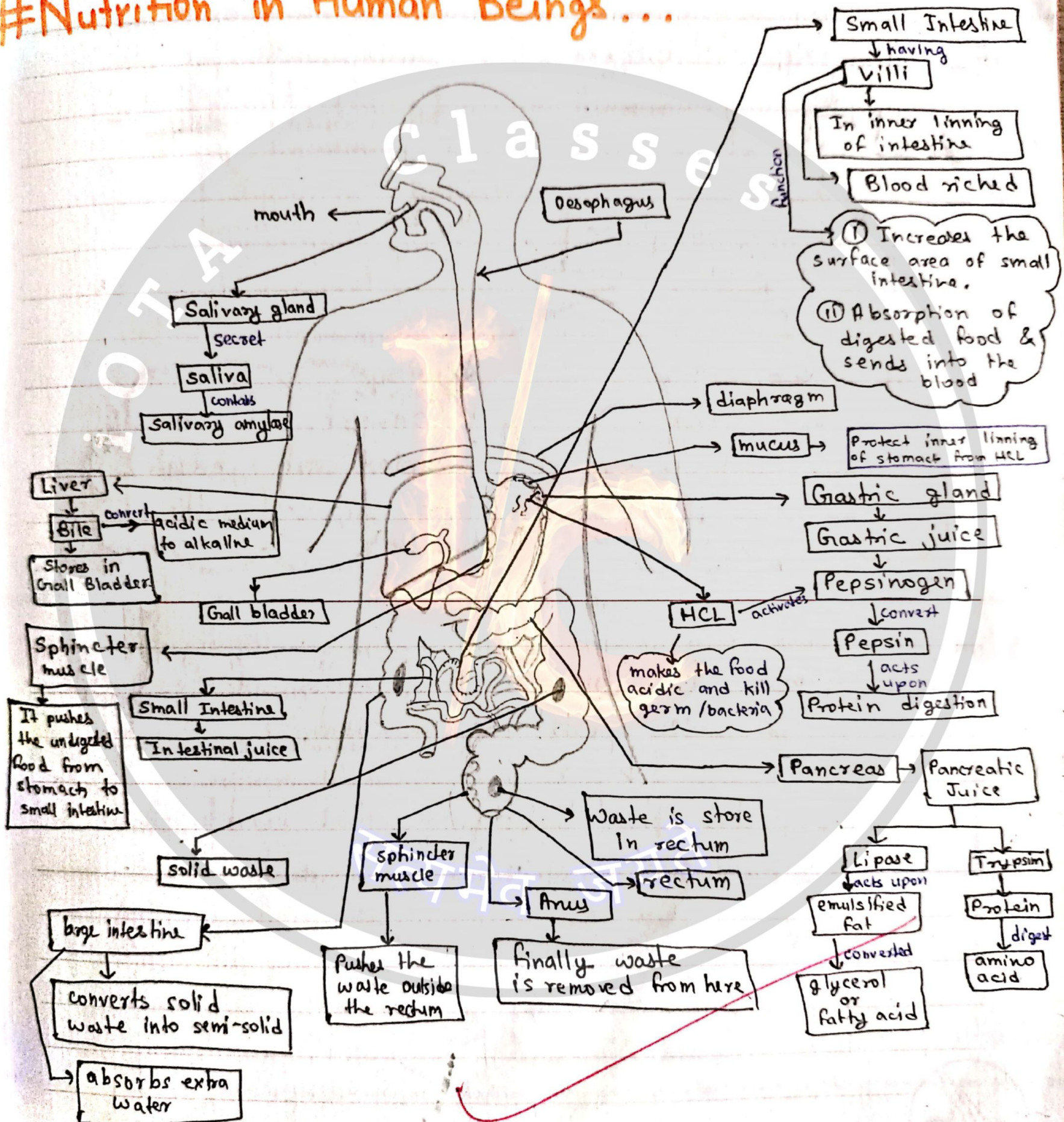
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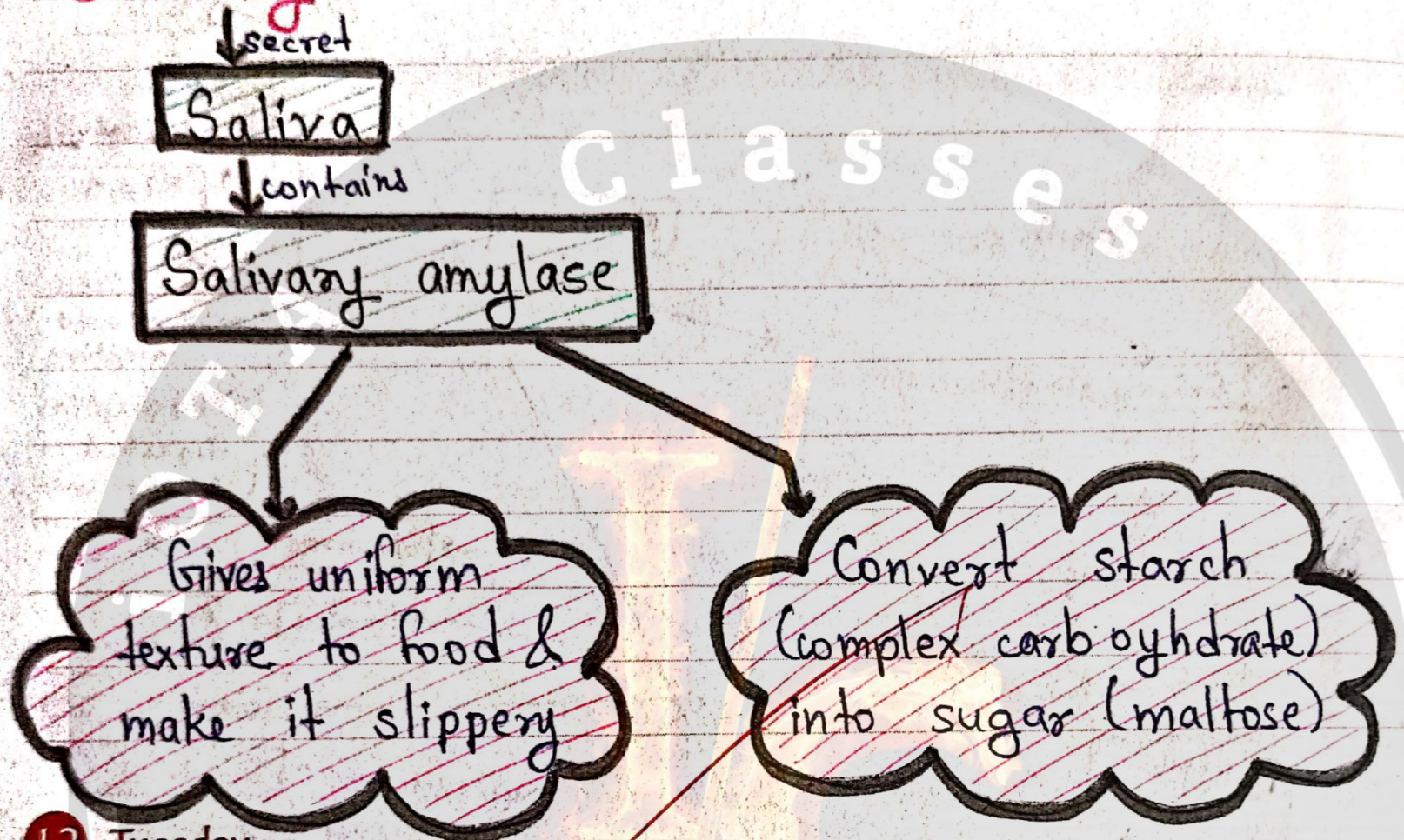


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#Nutrition in Human Beings...



Salivary Gland...



12 Tuesday

The expansion movement of the walls of food pipe is called peristaltic movement.

↓
It pushes the slightly digested food into the stomach.



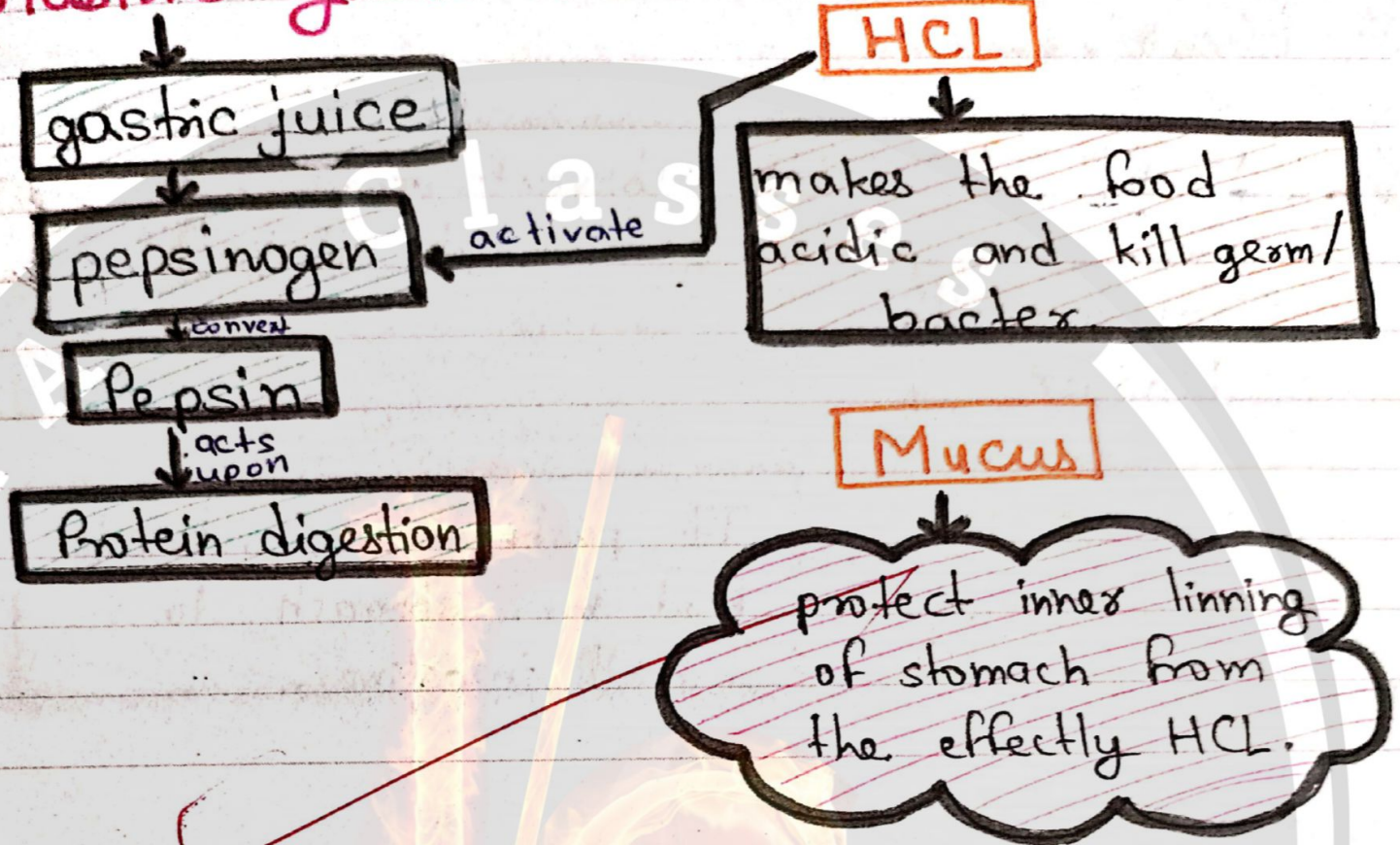
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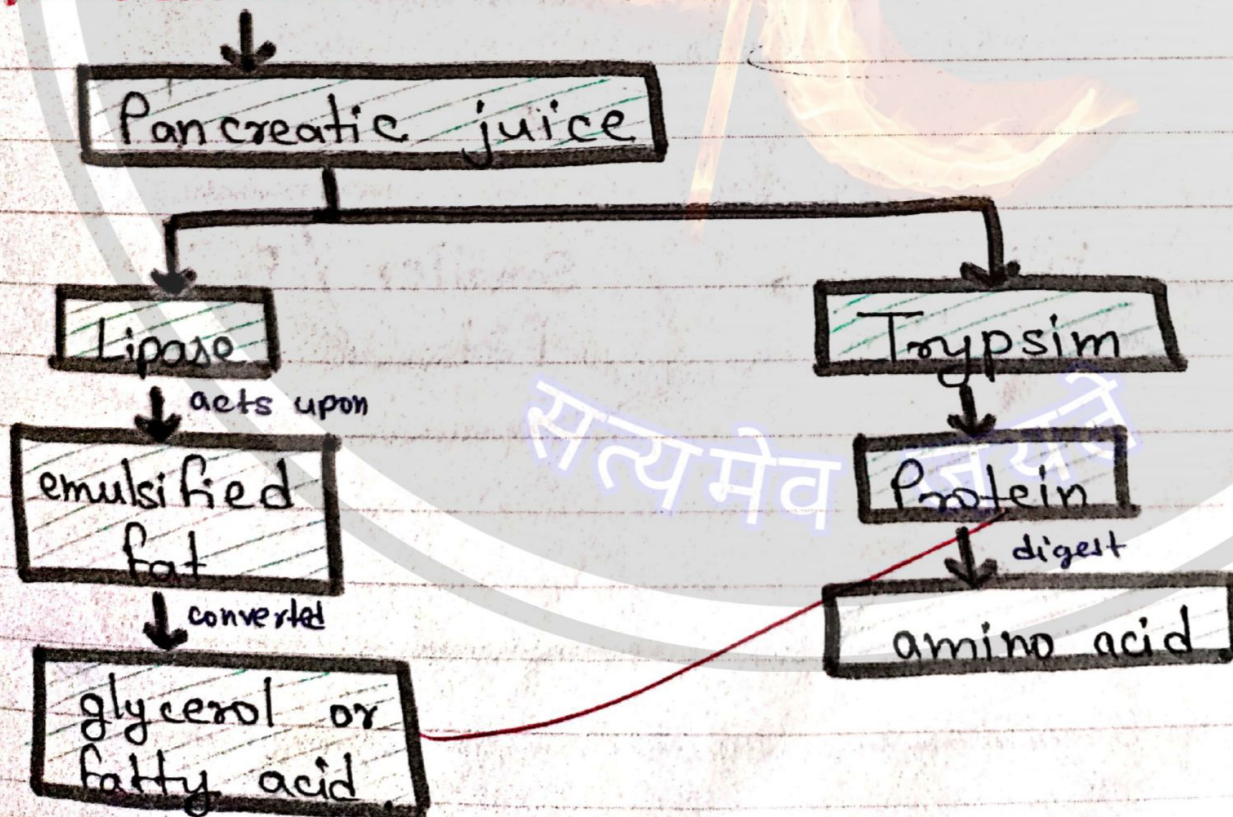
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Gastric gland...



14 Thursday

Pancreas...



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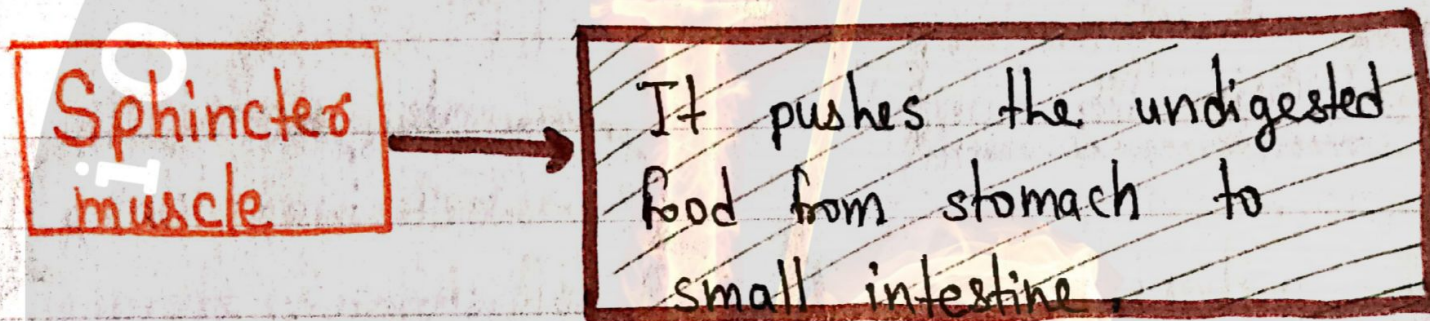
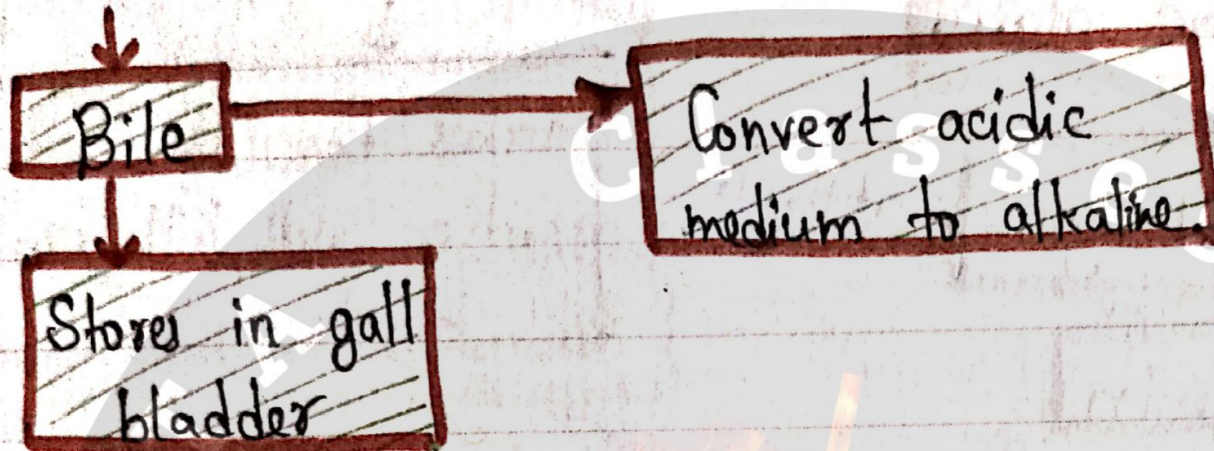
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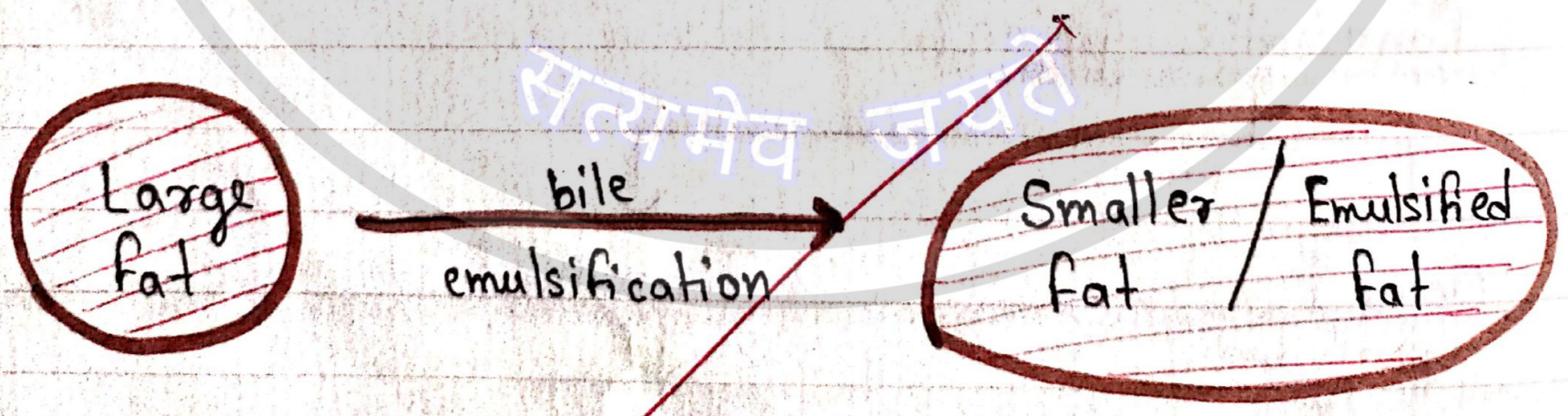
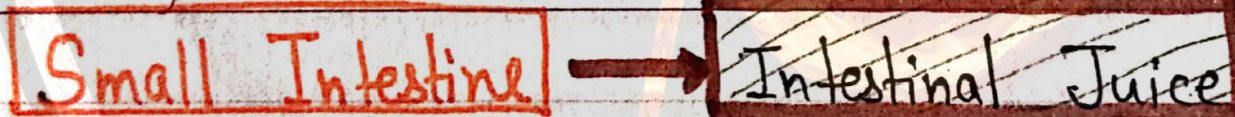


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Liver ...



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Emulsification ...

The process in which large fat globul break down in smaller fat globul.



large globul fat

break
into
smaller
one



smaller globul fat

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- Digestion is started inside the mouth,
- Digestion is completed inside small intestine.



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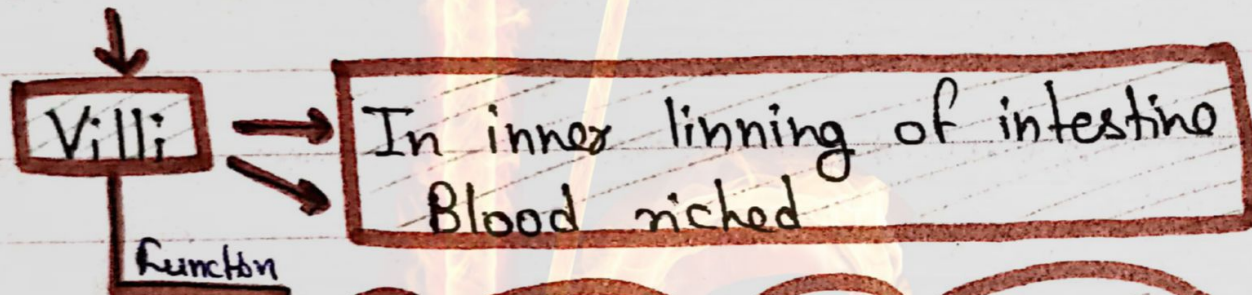


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During digestion ...

Carbohydrate → Glucose
Protein → amino acid
Fat → Glycerol / fatty acid.

Small Intestine...



20 Wednesday

- ① Increases the surface area of small intestine.
- ② Absorption of digested food & sends into the blood.

Sphincter muscle...

Pushes the waste outside the rectum.



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21 Thursday

Large Intestine...

Solid waste into
semi-solid

Absorbs extra
water

Waste is store
in rectum

Anus

finally waste is
removed from
body

22 Friday

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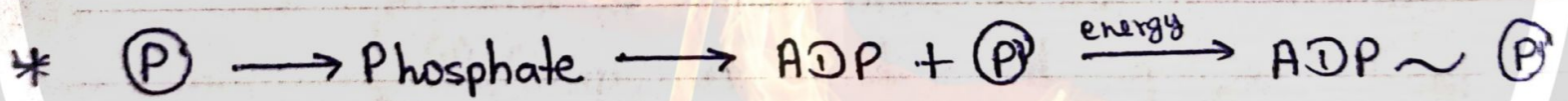
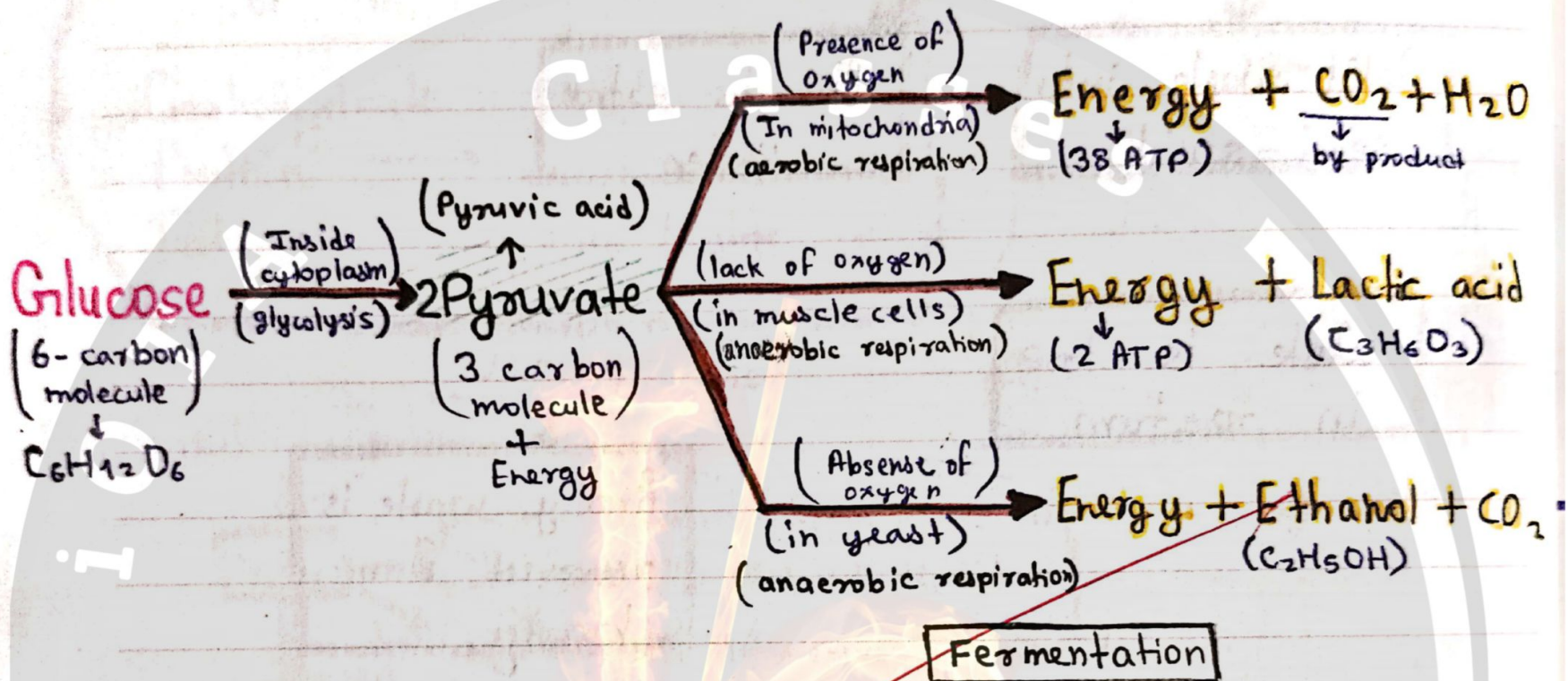
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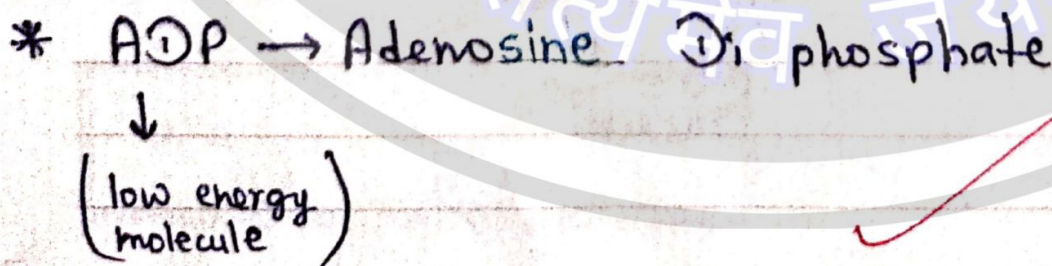


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Respiration.....



$ADP \sim (P)$ $\leftarrow$ ATP (high energy molecule)



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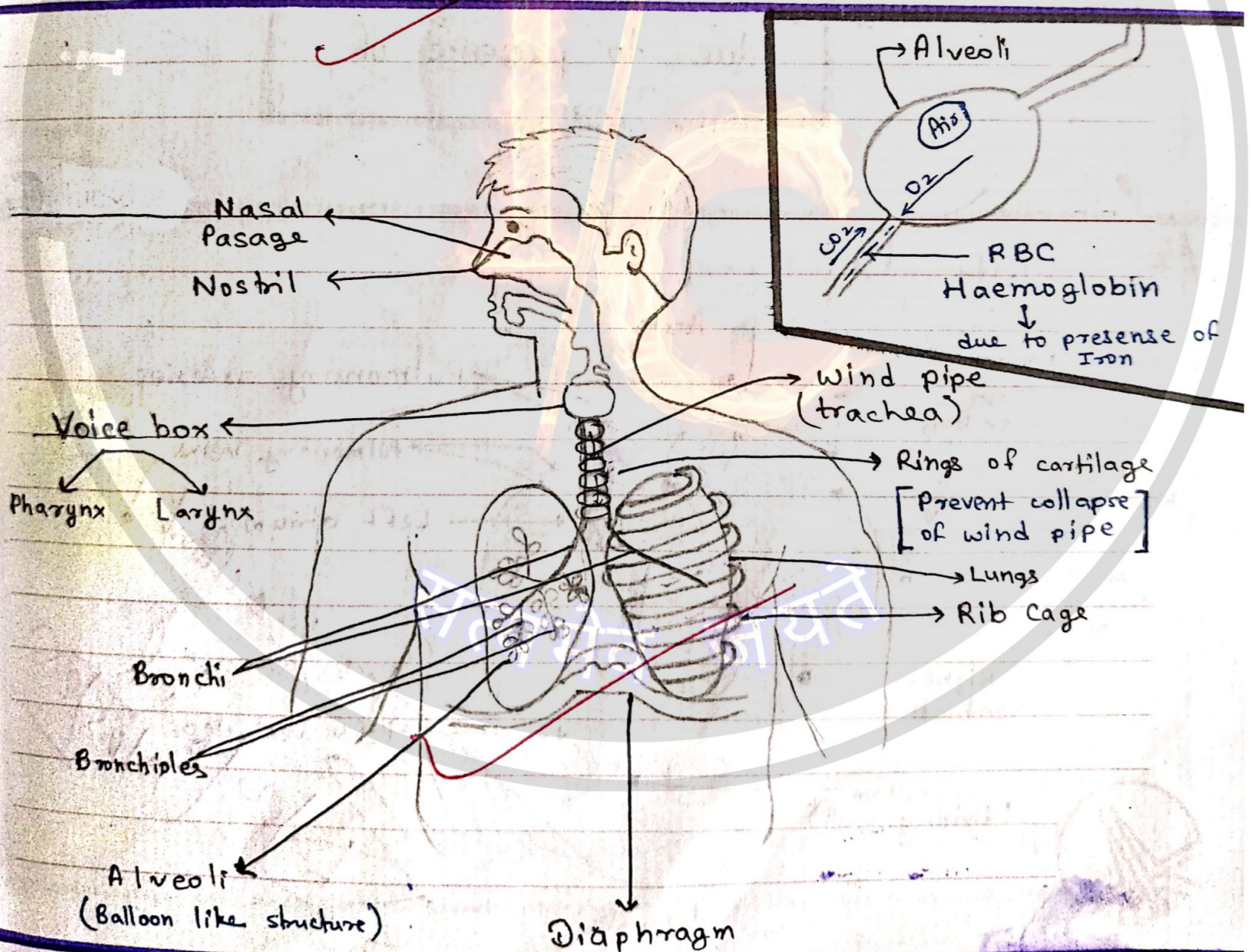


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* 1 mole ATP = 30.5 KJ

* $ADP + P \rightarrow \text{Energy} + ADP + P$
 $ATP \rightarrow \text{Energy} + ADP + P$

ATP is the energy currency for most cellular processes.



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27 Wednesday

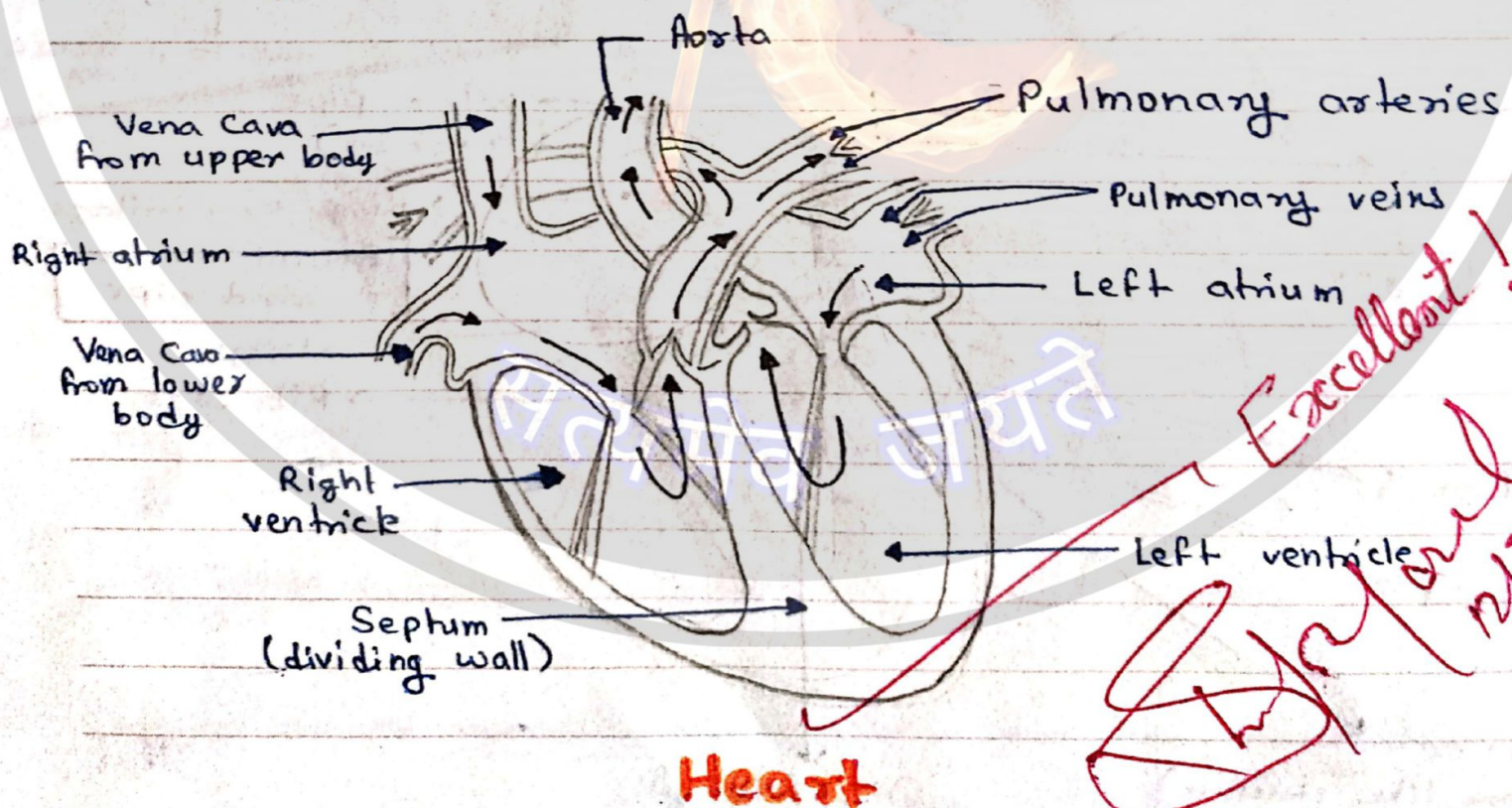
1 Haemoglobin contains
 4-O_2 molecules.

Haemoglobin is also
known as "respiratory
pigment".

In RBC (red blood cell)
haemoglobin is present
(red in colour)
↓
due to presence of
Iron.

28 Thursday

Transportation...



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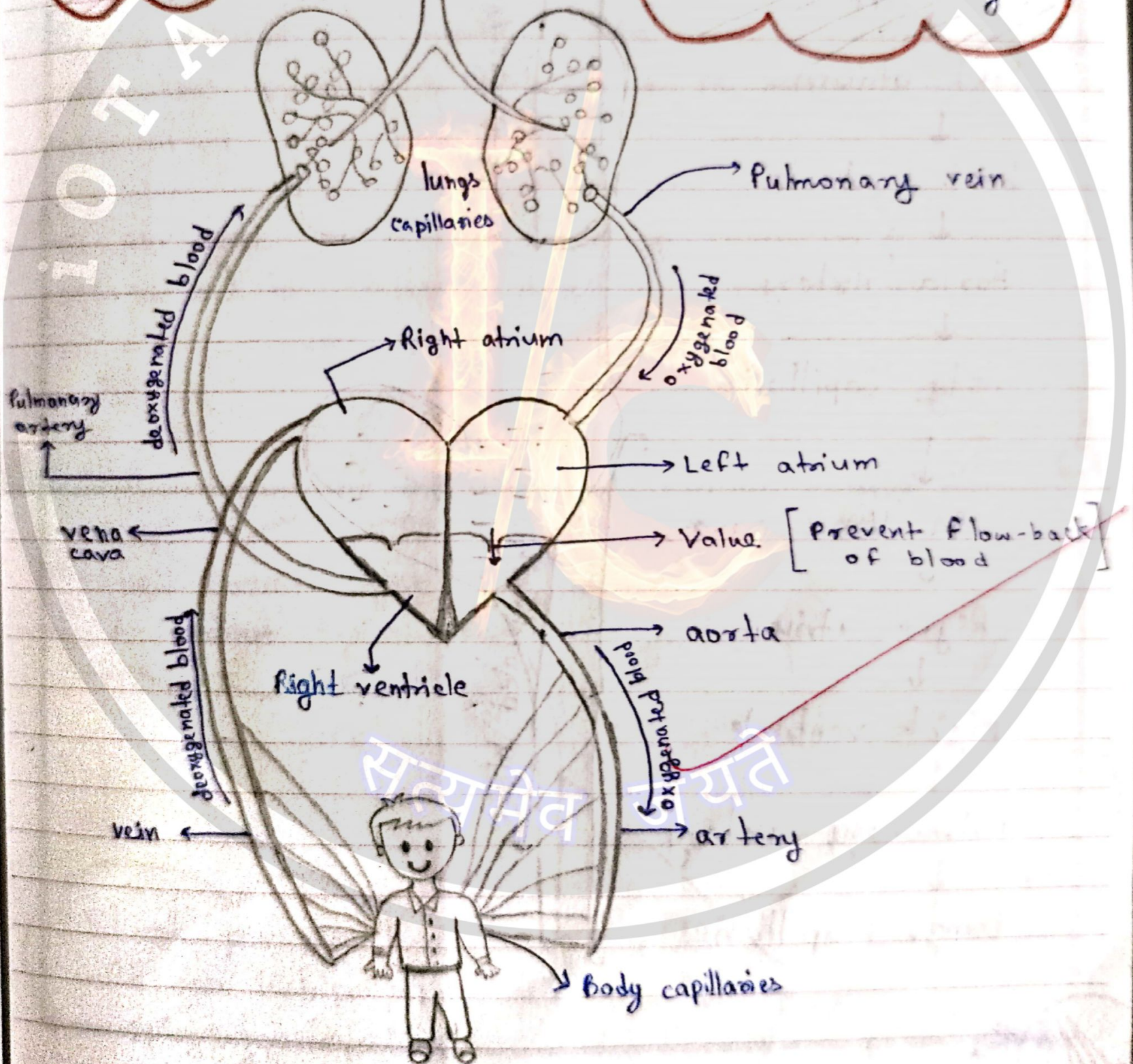
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24

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Artery → Thick & elastic wall to counter blood pressure,

Ventricle → Thick & elastic wall as it pumps blood to all over the body.



Life Process



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Lungs capillaries



Pulmonary vein



Left atrium



Left ventricle



Aorta / Artery



Body Capillaries

Double Circulation..

oxygenated blood

Sunday



Vein / Vena cava



Right atrium



Right ventricle



Pulmonary artery



Lungs capillaries

deoxygenated blood



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3 Monday

Blood Pressure...

- ↳ The force that blood exerts against the wall of a vessel is called blood pressure.
- The pressure of blood inside the artery during ventricular systole (contraction) is called systolic pressure.
- The pressure in artery during ventricular diastole (relaxation) is called diastolic pressure.

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The normal systolic pressure is about 120 mm of Hg.

The normal diastolic pressure is 80 mm of Hg.

Blood pressure is measured with an instrument called sphygmomanometer.



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5 Wednesday

Platelets...

* Platelets is also known as thrombocyte.

* Thrombocyte having thrombocyte.

↓
(help in clotting of blood)

* Platelets help to maintain the blood pressure.

Excellent! 😊

15/10/2020

6 Thursday

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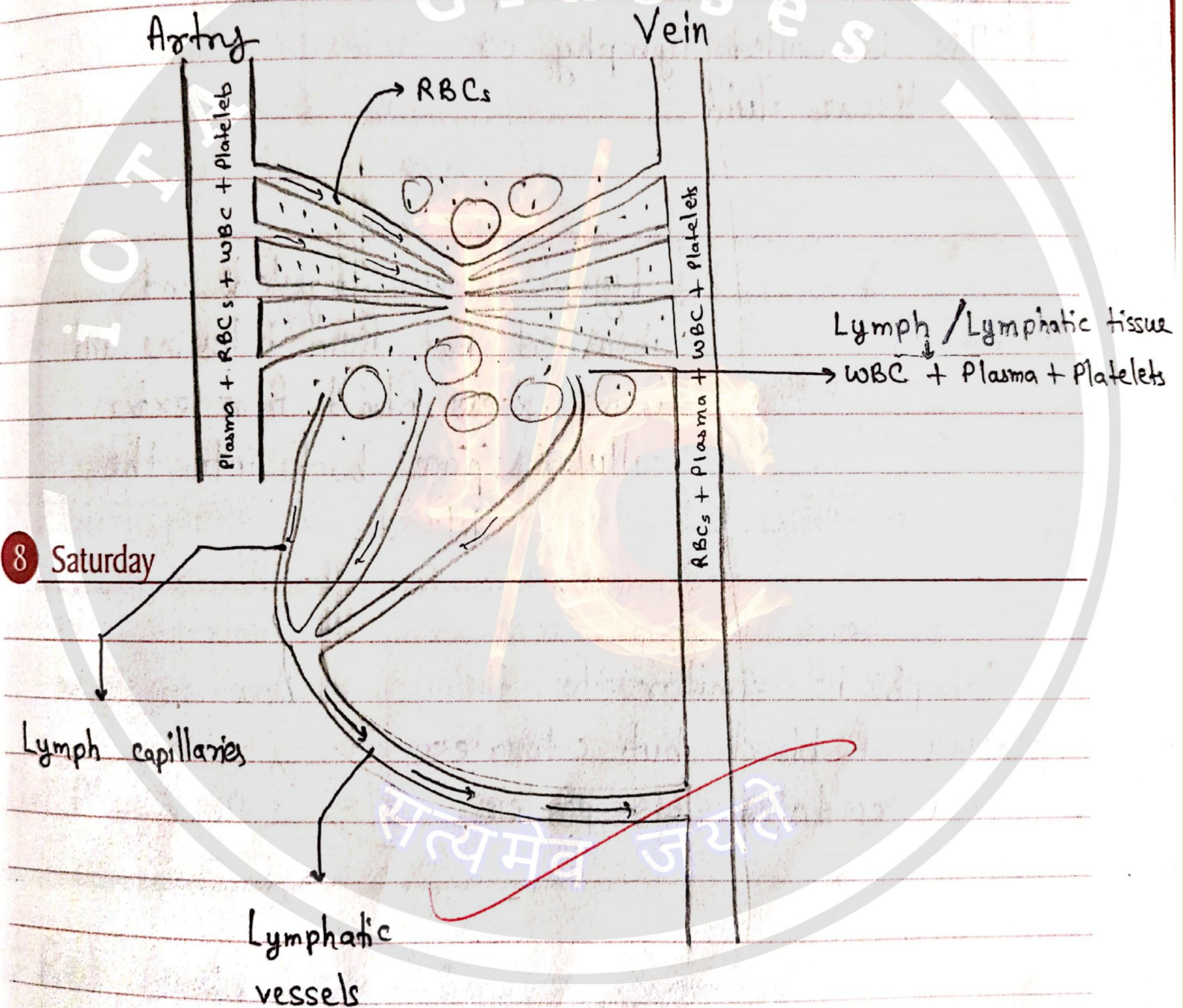
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Blood $\rightarrow$ Plasma + RBCs + WBC + Platelets



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There is another type of fluid also involved in transportation. This is called lymph or tissue fluid.

Lymph carries digested and absorbed fat from intestine and drains excess fluid from extra cellular space back into the blood.

10 Monday

Lymph is similar to the plasma of blood but colourless and contains less protein.

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Lymph is a pale yellow coloured fluid tissue.

- The main function of Lymph is to carry the secretion and materials from tissues into the blood and from blood to the tissues.

Functions of Blood...

- (i) Maintenance of body temperature.
- (ii) Maintenance of proper osmotic concentration around cells, tissues and organs.
- (iii) Transportation of substances such as gases, hormones, nutrients and metabolic waste between different body parts.
- (iv) Play active role in body defence.

Red Blood Cells [Erythrocytes] ...

* Functions :-

- Provide red colour to the blood.
- Haemoglobin transport oxygen to all body cells during respiration.



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White Blood Cells [Leucocytes]...

* Functions :-

- Digest disease causing pathogens.
- Secrete antibodies against microbes in blood.
- Engulf bacteria and cellular products at the site of injury or damage.
- Respond to allergies and show antihistamine properties.

14 Friday

Plasma...

- The liquid matrix of blood is called plasma.
- It is a pale yellow coloured fluid which consists of 90 % water and 10 % of proteins.
- The various components of blood present in the plasma are red blood cells, white blood cells and blood platelets.

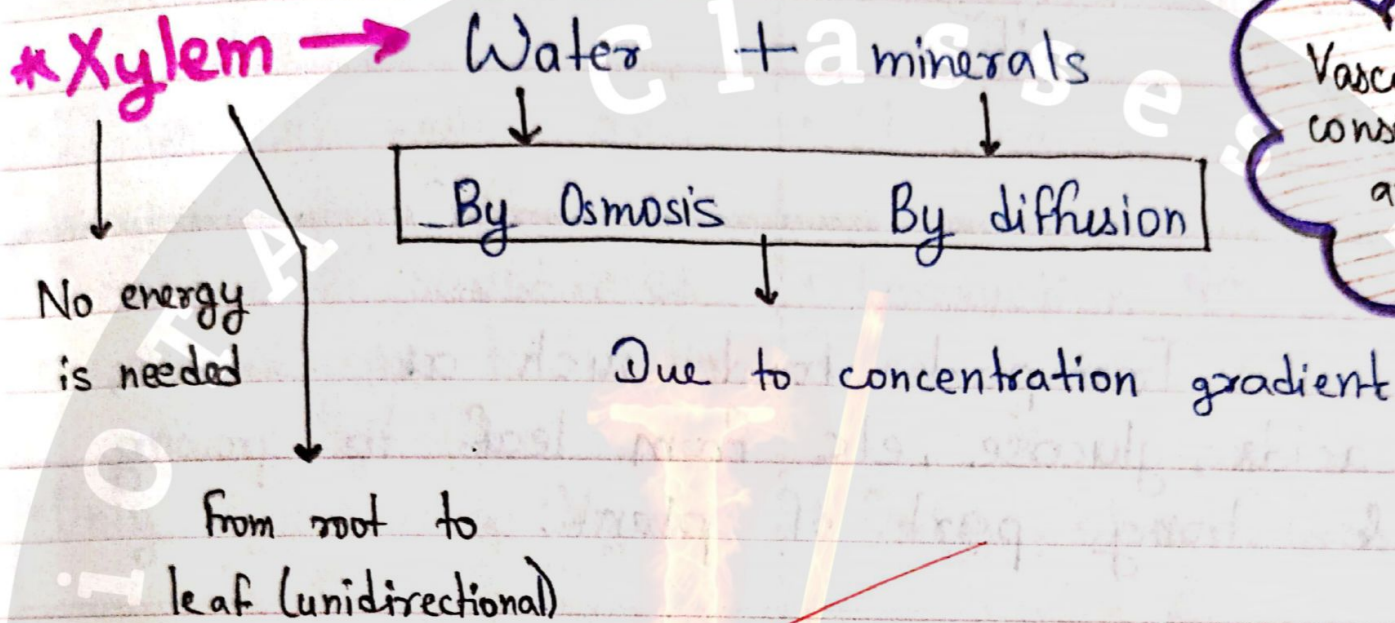


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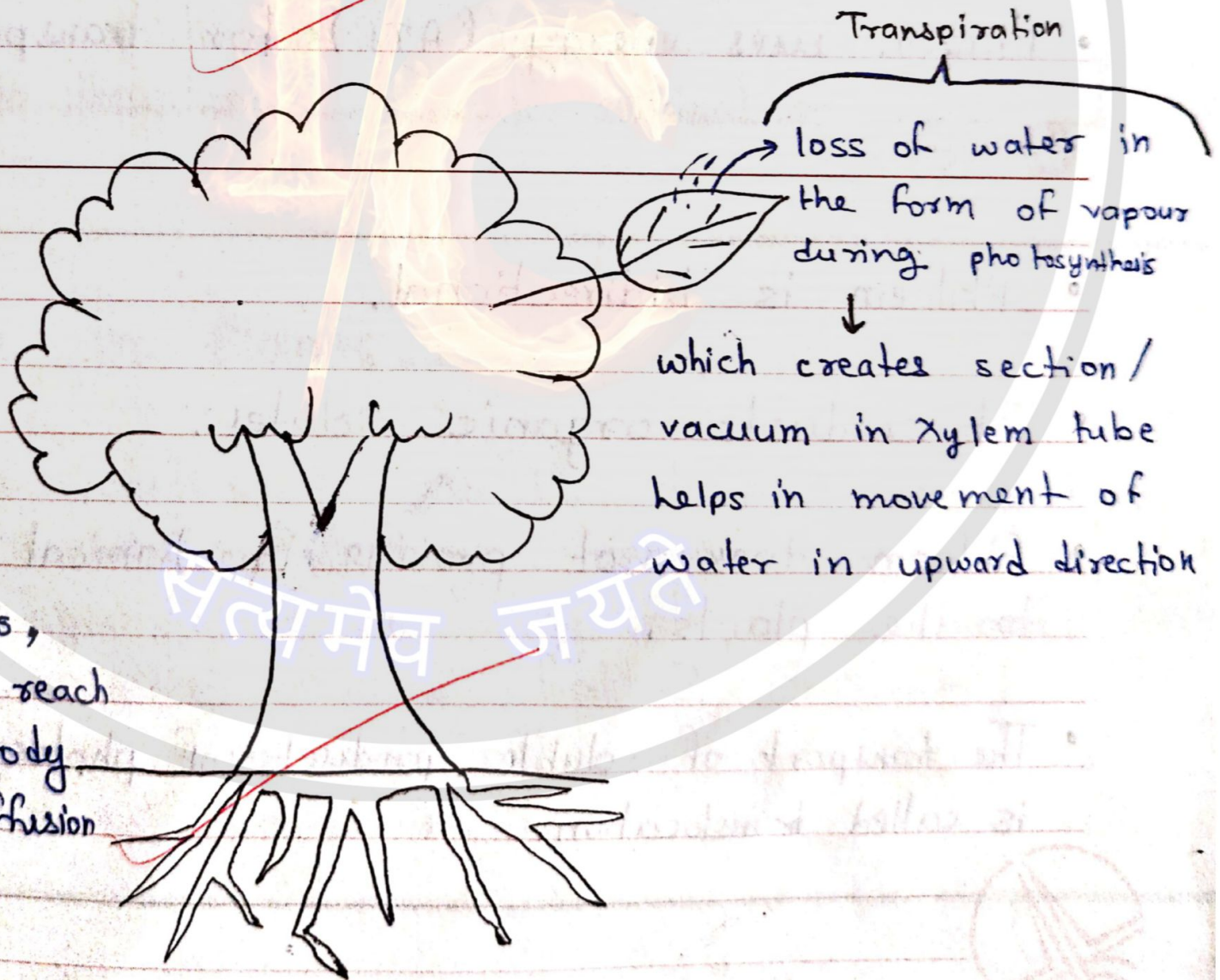


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Transportation in Plants...



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In tall plants, water does not reach all over the body by osmosis/diffusion only.

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In small plants,
water reaches all
over the body
by diffusion/
osmosis



* **Phloem** →

Transport food such as Sucrose, amino acids, glucose, etc from leaf to growing part & strong part of plant.

- Phloem uses energy (ATP) for transportation.

18 Tuesday

- Phloem is bidirectional.
- It conducts organic solutes.
- Phloem does not provide mechanical strength to the plants.
- The transport of soluble products of photosynthesis is called translocation.



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Difference between Xylem and Phloem.....

Xylem	Phloem
• It conducts water and inorganic solutes. • Conduction of substances occurs in upward direction only. • Only Xylem parenchyma is living. • Xylem provides mechanical strength to the plant.	• It conducts organic solutes. • Conduction of substances occurs in both the directions. • Only phloem fibres are dead. • Phloem does not provide mechanical strength.

20 Thursday

#Excretion in Plants...

Removal of waste such as O_2 during Photosynthesis and other metabolic waste are removed by using simple strategies, such as falling of leaf, removal of bark, secreting resins, falling of fruits, after they are rippen & other chemical wastes are removed by roots in soil.



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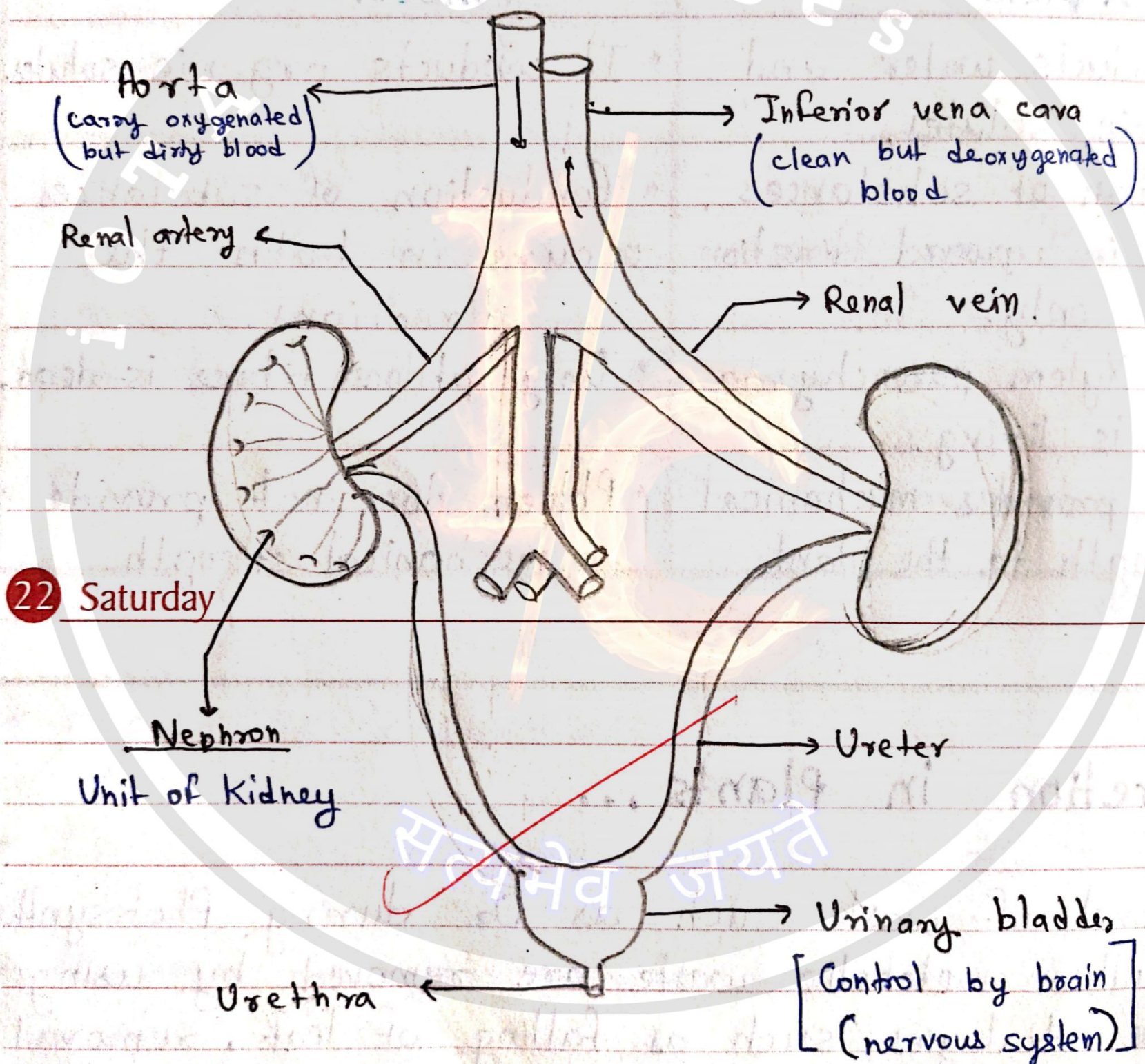
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Excretion in Animals...

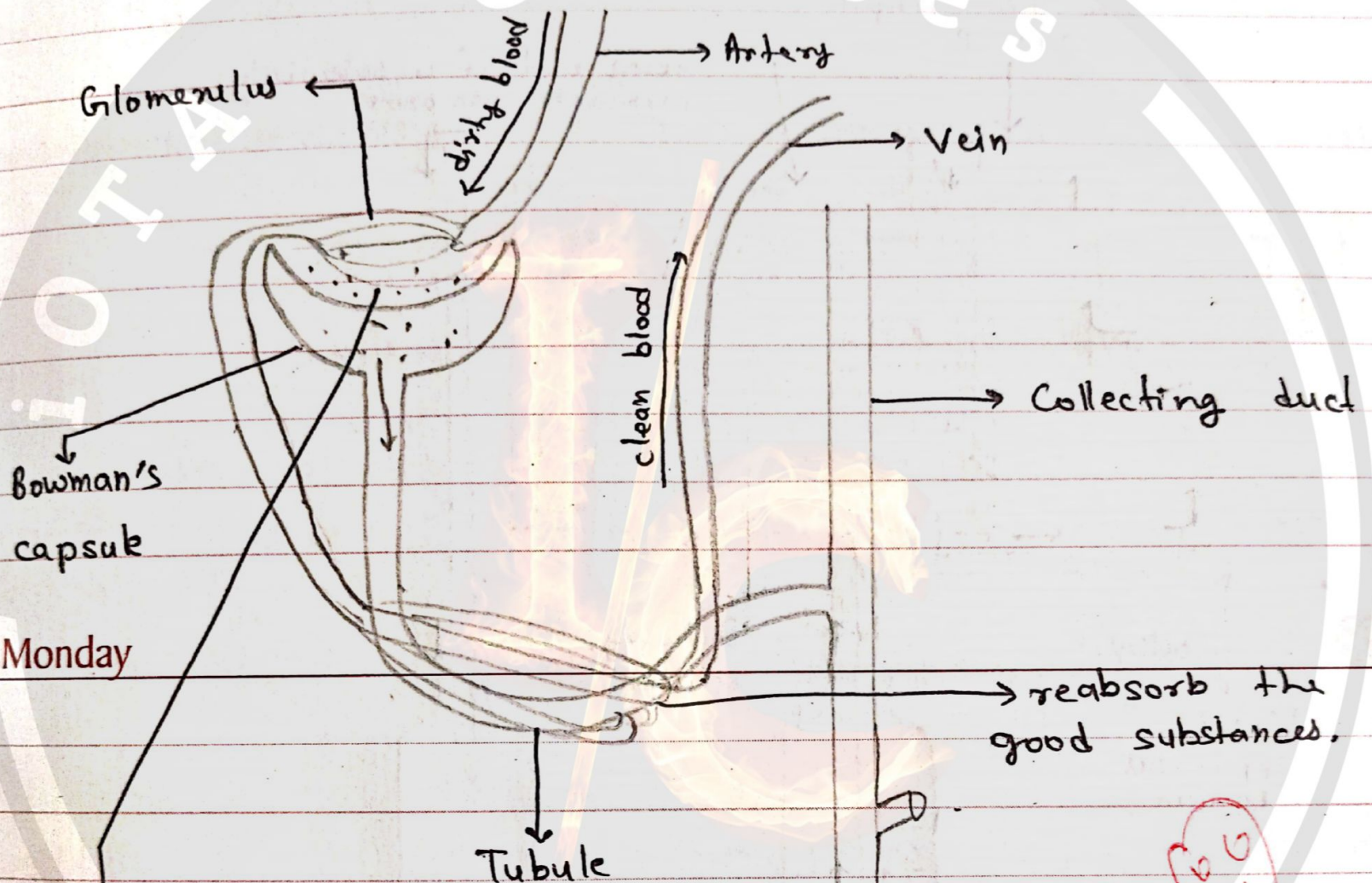


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Nephron...



Filtrate

→ Glucose

→ Water

→ Uric acid

→ Urea

→ Ammonia

→ Good Salt / Bad Salt, etc.



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Artificial Kidney [Hemodialysis].....

