

17/4/20

# Biology

## Life Processes

→ Life processes - The basic function performed by all living organism to maintain their life on this earth are called life processes  
eg - Transport and excretion, control and coordination, growth, movement, Nutrition, Respiration and reproduction.

→ characteristics of living things

- They can move by themselves
- They need food, air and water
- They can grow
- They can respond to the change around them.
- They can respire.
- They can excrete
- They can reproduce
- They are sensitive

→ Nutrition → The process of intake of nutrients ex- protein, minerals, water and vitamins etc. by an organism as well as the utilization of these nutrients by the organism to obtain energy.

for performing various metabolic activities.

→ Nutrients - It is an organic and inorganic substances for the maintenance of life and survival of living organism.

→ Mode of Nutrition - These are the methods of procuring and obtaining food by an organism.

→ Autotrophic mode of Nutrition - It is that mode of nutrition in which an organism prepare its food from simple inorganic material like carbon-dioxide and water present in the atmosphere. The organism which can prepare their own food are called autotrophs. Ex - Green Plants and some bacteria.

→ Heterotrophic Mode of Nutrition - It is that mode of nutrition in which an organism can not synthesise their own food from simple inorganic material like carbon-dioxide and water. These organism which can not prepare their own food and depend on autotroph for their nutrition are called heterotrophs.

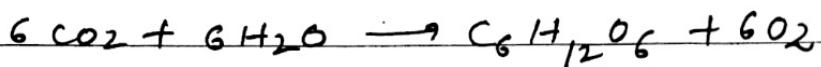
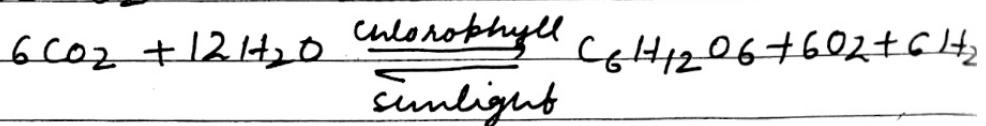
Ex - All animals, Human beings, most bacteria and fungi

## → Types of Heterotrophic Mode of Nutrition

- Saprophytic Mode of Nutrition - It is that mode of nutrition in which an organism obtain its food from dead and decaying organic matter of plant, animal etc. Organism with saprophytic mode of nutrition are called as saprophytes.  
eg- yeast, mushroom, Rhizopus
- Parasitic Mode of Nutrition → It is that mode of nutrition in which an organism derives its food from the body of another living organism called host without living it. A parasite is an organism which feeds on another living organism is called its host. ex- Amoeba, leech
- Holozoic Mode of Nutrition → It is that mode of nutrition in which the organism takes the organic food material into its body by the process of ingestion. The ingested food is digested and absorbed into the body of the organism.

## Nutrition in plants -

→ Photosynthesis → The process by which green plant make their own food from  $\text{CO}_2$  and  $\text{H}_2\text{O}$  by using sunlight energy in the presence of chlorophyll is called photosynthesis. During this process  $\text{O}_2$  is released.



→ Events that takes place during Photosynthesis - It take place in three steps

- (i) Absorption of Sunlight energy by chlorophyll
- (ii) conversion of light energy into chemical energy splitting water into Hydrogen and oxygen by light energy
- (iii) Reduction of  $\text{CO}_2$  by hydrogen to form carbohydrate like glucose by using chemical energy.

How does desert plant Photosynthesis -

desert plant takes up  $\text{CO}_2$  at night and prepare an intermediate which is acted upon by the energy absorbed by the chlorophyll during the day

Note - Enzymes are bio catalyst helps in chemical digestion of food

- (i) carbohydrate are used in the form of starch in plants
- (ii) In human beings food is stored

in the form of glycogen.

→ How does the plant obtain  $\text{CO}_2$  - The green plant take  $\text{CO}_2$  from air for photosynthesis through stomata present on their surface and each stomatal pore is surrounded by a guard cell which control the opening and closing of stomata - when water flows in to guard cells they swell, becomes curved and causes the pores to open and when it loses  $\text{H}_2\text{O}$  they shrink & become straight and causes pores to close.

\* Stomatal pores are also present in stem  
How does plant obtain  $\text{H}_2\text{O}$  - green plant absorb water by the roots from the soil through the process of osmosis it is transperated upward through the xylem.

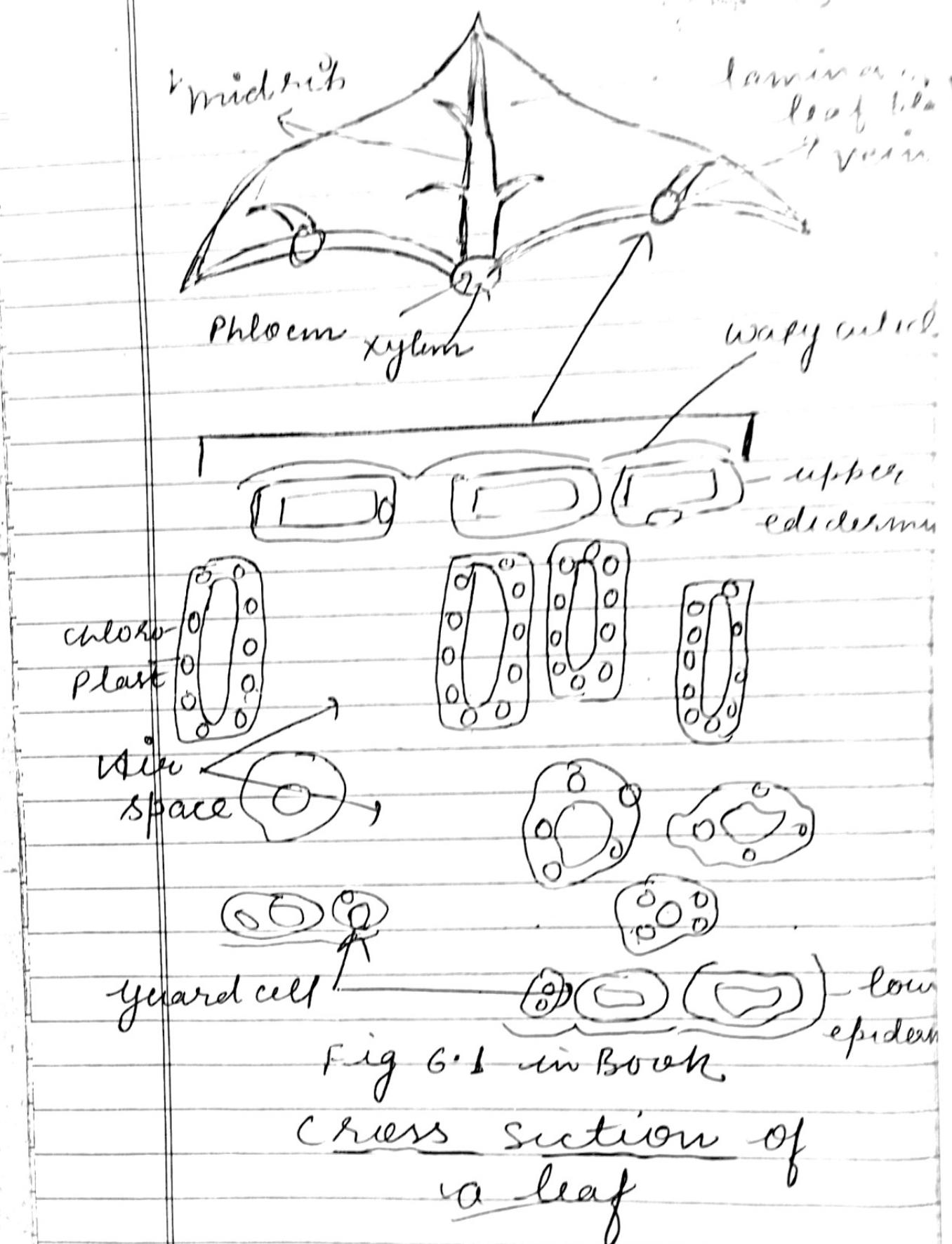
Site of Photosynthesis -

chloroplast - (i) These are present in the mesophyll cells of green plants. It can be easily seen by light microscope.

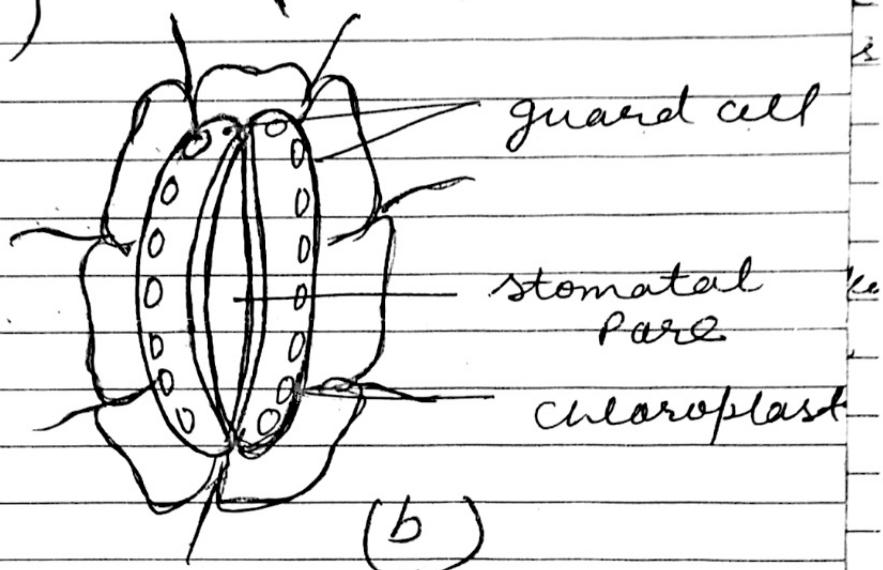
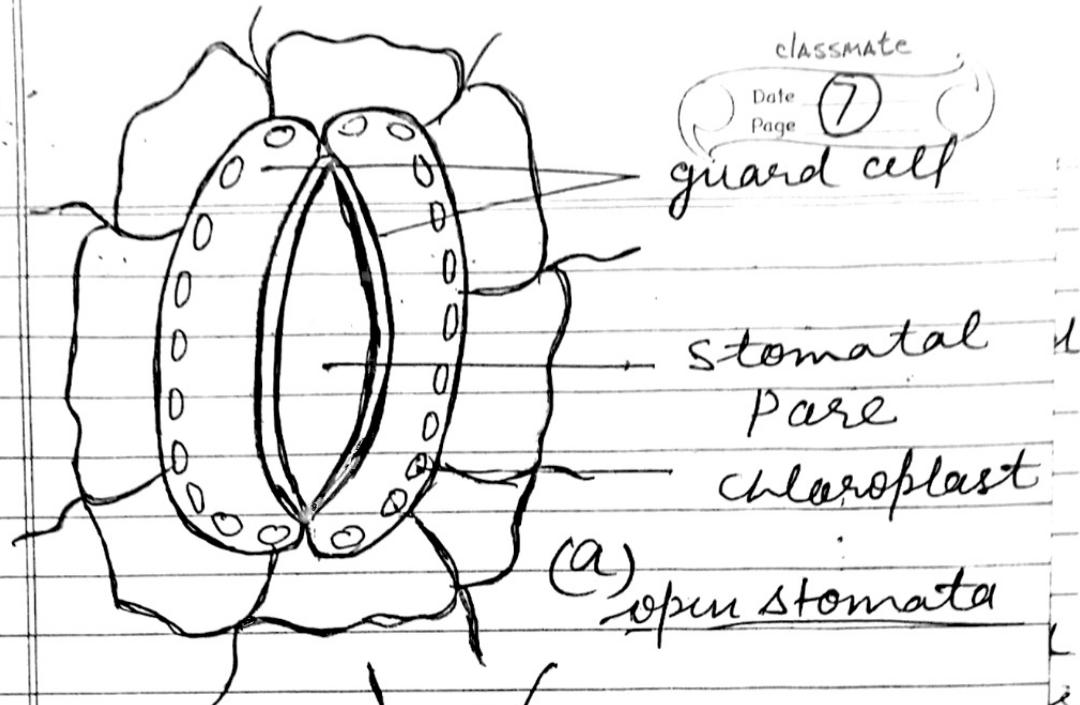
(ii) A typical mesophyll cell contains 100 or more tiny chloroplast

(iii) A whole leaf contain 1000 of mesophyll cells

(iv)  $\text{CO}_2$  needed for photosynthesis enters from the air into leaf through stomata in its lower epidermis and then diffuse into mesophyll cell and reaches chloroplast



Q. - Write the structure of stomata and also write the process of opening and closing of stomata.

Ans.

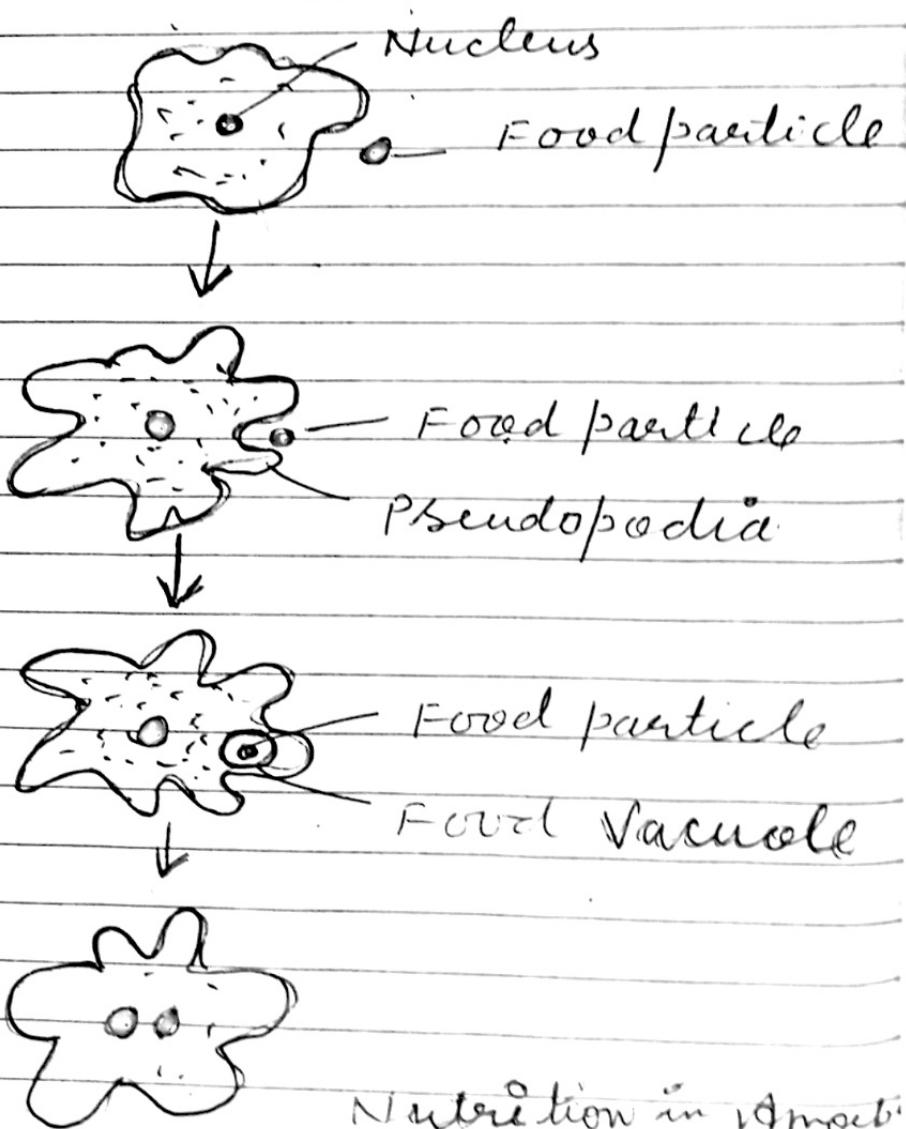
each stomata consists of two guards cells. each guard cell consists of chloroplast, nucleus and cytoplasm. Between the two guard cells stomatal pore is present.

opening and closing of stomata  
guard cells swell when water flows into them causing stomatal pore to open.  
similarly stomatal pore close

If the guard cells shrink  
ones - in which form  $N_2$  is taken  
up by the plants?

Ans - Nitrogen is taken up by the  
plants in the form of inorg-  
anic nitrates or nitrites or  
it is taken as organic compound  
which have been prepared by  
bacteria from atmospheric  $N_2$ .

### Nutrition in Amoeba -



① Nutrition in amoeba is

Holozoic type

- ② When the food particles comes near amoeba then it extend its pseudopodia.
- ③ In this way it encircle the food particle.
- ④ Later on the tips of the encircling pseudopodia dissolved food in the form of food vacuole comes in cytoplasm.
- ⑤ Now the digestion of food takes place with the help of enzymes present in cytoplasm.
- ⑥ Then this digested food gets diffused into cytoplasm and is utilised to obtain energy by amoeba.
- ⑦ While undigested food is thrown outside.
- \* Paramecium has a definite shape so in paramecium the food is taken in at a specific spot by the movement of cilia.

Nutrition in Human beings -

Human digestive system consist of alimentary canal and digestive gland

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Human being alimentary canal nearly 9m long extended from mouth to anus. Various parts of alimentary canal are

1. Mouth
2. Buccal cavity
3. Oesophagus
4. Stomach
5. Small intestine
6. Large intestine

Digestive gland associated with the digestive system are

1. Salivary gland
2. Pancreas
3. Liver (largest digestive gland)

In human being there is Holozoic mode of nutrition so different steps of nutrition are

1. Ingestion
2. Digestion
3. Absorption
4. Assimilation
5. Egestion

1. Ingestion - The food is taken in with the help of mouth.

2. Digestion - (a) Digestion in Buccal cavity - Buccal cavity consists of teeth, tongue, salivary gland &

1 Teeth - They help in chewing and grinding the food.

2 Tongue - The taste buds present on the tongue give the taste. Tongue also help in mixing the food with saliva and it also help in swallowing the food.

Salivary gland - They secrete saliva. Saliva contains an enzyme salivary amylase or Ptyalin which breaks down starch into sugar.

(i) It mix the saliva with food.

B) Digestion in oesophagus - No digestion takes place in oesophagus. In oesophagus the lining of alimentary canal has muscles that contract rhythmically in order to push the food forward.

These movements are called peristaltic movements.

C) Digestion in stomach - In stomach the food is churned for about 3 hours. In this time the food breaks down into smaller pieces and form a semi solid paste.

The inner wall of stomach

contain gastric gland which secretes gastric juice  
gastric juice contains 3 substances  
(1) HCl      (2) Pepsin      (3) Mucus

1) HCl → HCl maintains acidic medium in stomach which is required for the action of pepsin. It also kills the harmful microorganisms of food.

2) Pepsin - It helps in digestion of Proteins. (The enzyme of stomach is pepsin).

3) Mucus - It protects the inner lining of stomach from the actions of the acid.

\* Viscosity in stomach is due to the formation of mucus acids

D) Digestion of small intestine

It is the longest part of alimentary canal. It receives the secretion of liver and pancreas.

1) Liver - (Largest gland) - Liver secretes Bile juice converts large globules of fats into smaller globules (Bile juice helps in emulsification of fats.)

Bile juice also maintains alkaline medium in small intestine which is essential for the functioning of Pancreatic enzymes.

## Pancreatic enzymes.

- 2) Pancrease - Pancrease secrete pancreatic juice. Two enzyme present in Pancrease are trypsin and pancreatic lipase enzyme.
- Trypsin helps in digestion of protein
  - Pancreatic lipase break down fat into fatty acid.

- 3) The wall of small intestine contain glands which secrete intestinal juice. The enzyme present in it finally convert protein into amino acids, fats into fatty acid and glycerol, carbohydrate into glucose. Thus complete digestion of food takes place in small intestine.

- Absorption - digested food is absorbed by the walls of small intestine. The inner lining of small intestine has a large number of finger like projection called villi. These villi increases the surface area for the absorption of food

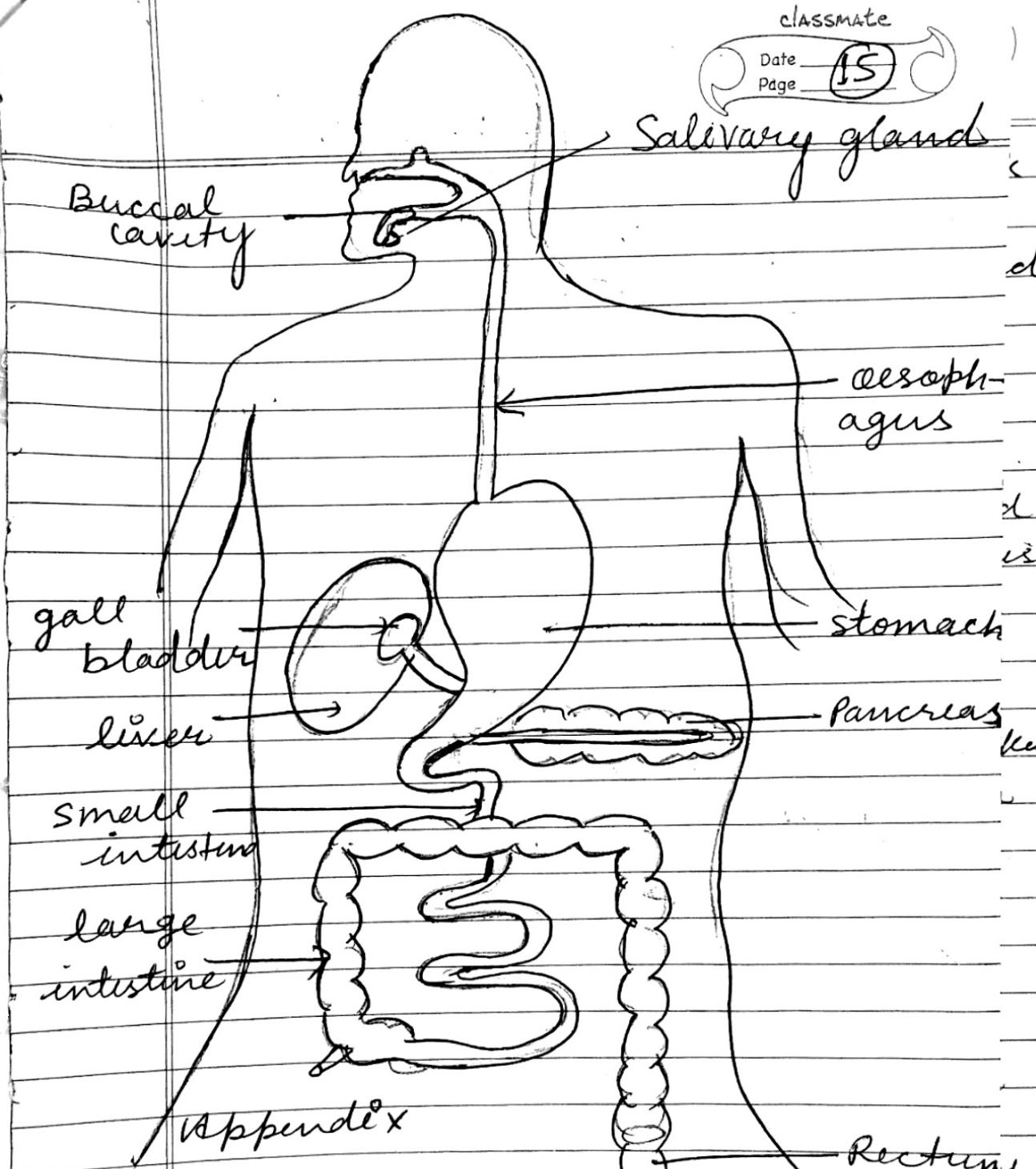
- Assimilation - These villi are richly supplied with blood

vessels which take the absorbed food to each and every cell of the body where it is utilized for obtaining energy, 5 egestion. The unabsorbed food is sent into large intestine where more villi absorb water from it and rest of the material is removed from the body via anus.

- \* The exit of waste material is regulated by anal sphincter.
- \* The exit of food from stomach is regulated by sphincter muscles which release it in small amount in small intestine.

(Q) Give reason herbivores have longer small intestine than carnivores.  
Ans: Because herbivores eats cellulose takes time to digest while carnivores eat meat which easier to digest and takes less time.

## Salivary glands



## Nutrition in

human beings