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DIGESTIVE SYSTEM

SUBJECT-BIOLOGY

CHAPTER NO- 4

Food, Types of Nutrients,

Digestive system in humans- Mouth, Types of Teeth, Tongue, Salivary Glands

PERIOD-1

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LEARNING OBJECTIVE

Students will-

- explain the importance of nutrition in living organisms.
- identify types of nutrients and their importance.
- Be able to identify the sources of nutrients.
- differentiate between macro nutrients and micro nutrients.
- Learn the organs associated with the digestive system of humans.

PRE-KNOWLEDGE QUESTIONS

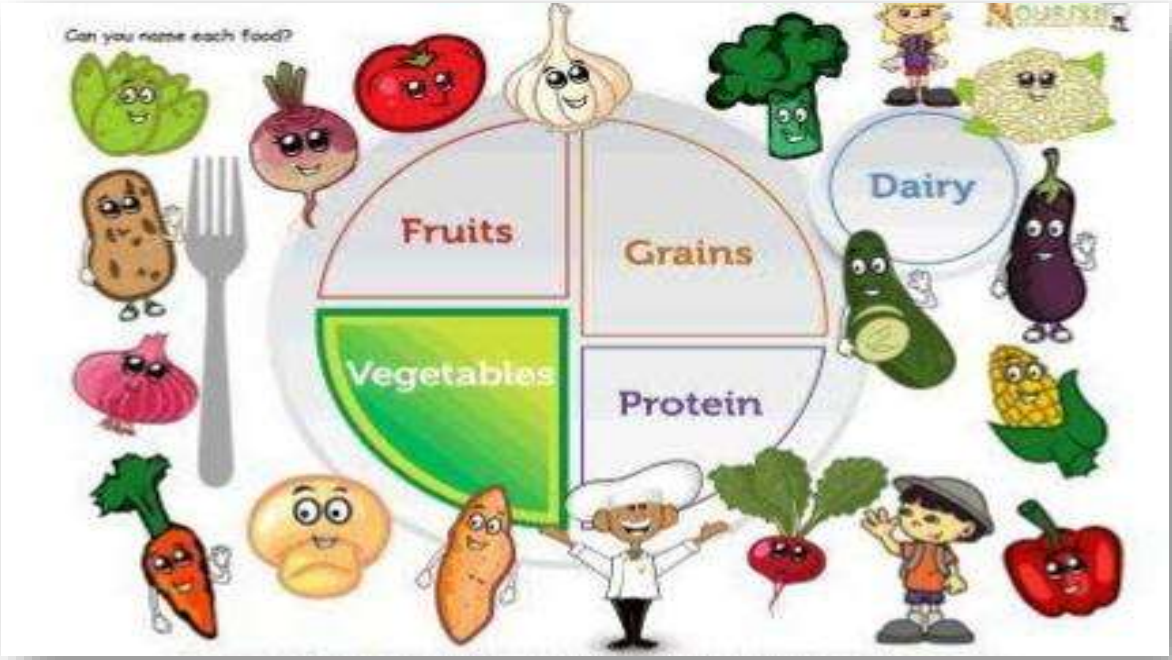
- 1. What are the different types of food that we eat?
- 2. How does the food we eat affect us?
- 3. Which food keeps us healthy- Pizza or Spinach?
- 4. Which kind of foods should we avoid?

NUTRITION

- **Nutrients** are the components found in our food such as carbohydrates, vitamins, minerals, fats, etc. These components are necessary for living organisms to survive.
- The process of obtaining food and utilizing it to grow, stay healthy and repair any damaged body part is known as **Nutrition**.

Poor nutrition can lead to reduced immunity, increased susceptibility to disease and impaired physical and mental development.

Nutritious food contains substances which help your body to be healthy.



Healthy eating means eating a variety of foods that gives nutrients to maintain good health and have energy.

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TYPES OF NUTRIENTS

1. 
Carbohydrates

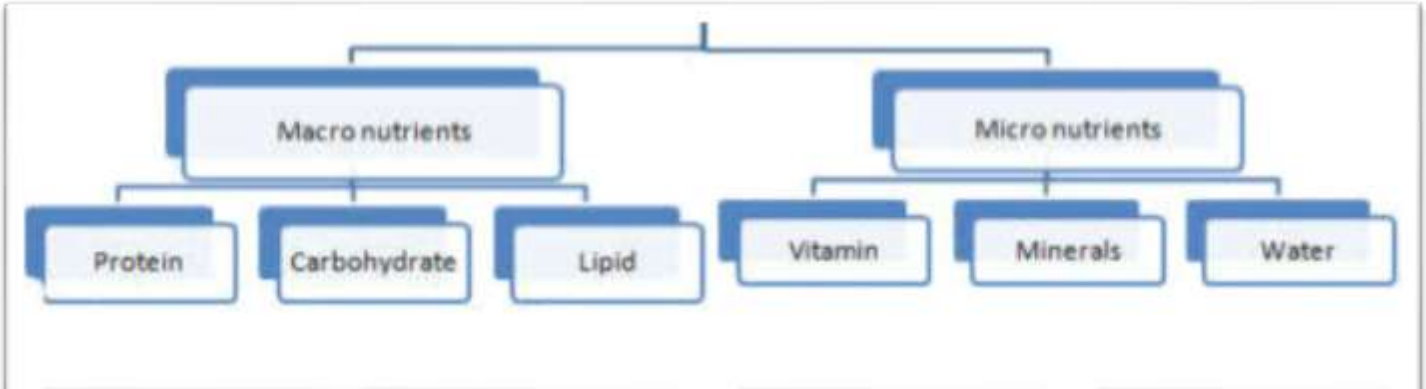
2. 
Proteins

3. 
Fats

4. 
Vitamins

5. 
Minerals

6. 
Water



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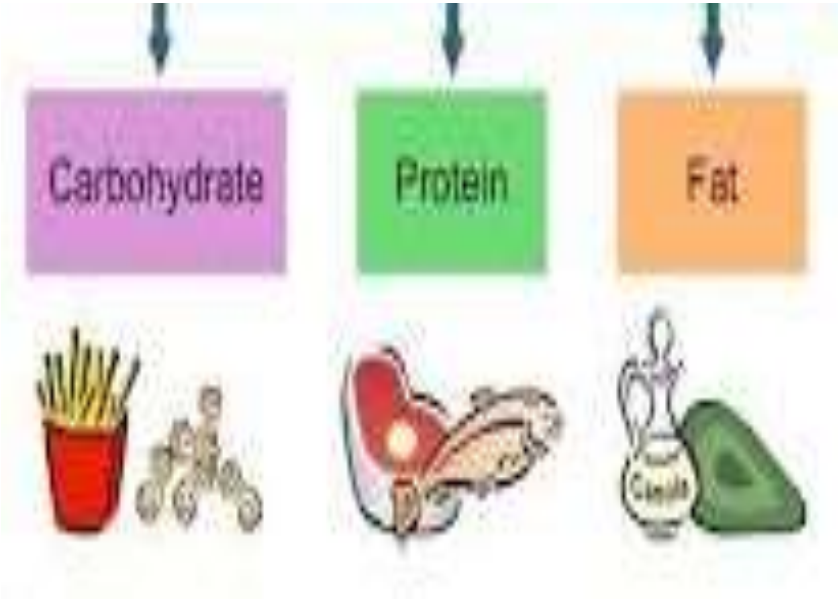
MACRO-NUTRIENTS

- Carbohydrates - our main source of energy.
- Fats - one source of energy and important in relation to fat soluble vitamins.
- Proteins - essential to growth and repair of muscle and other body tissues.



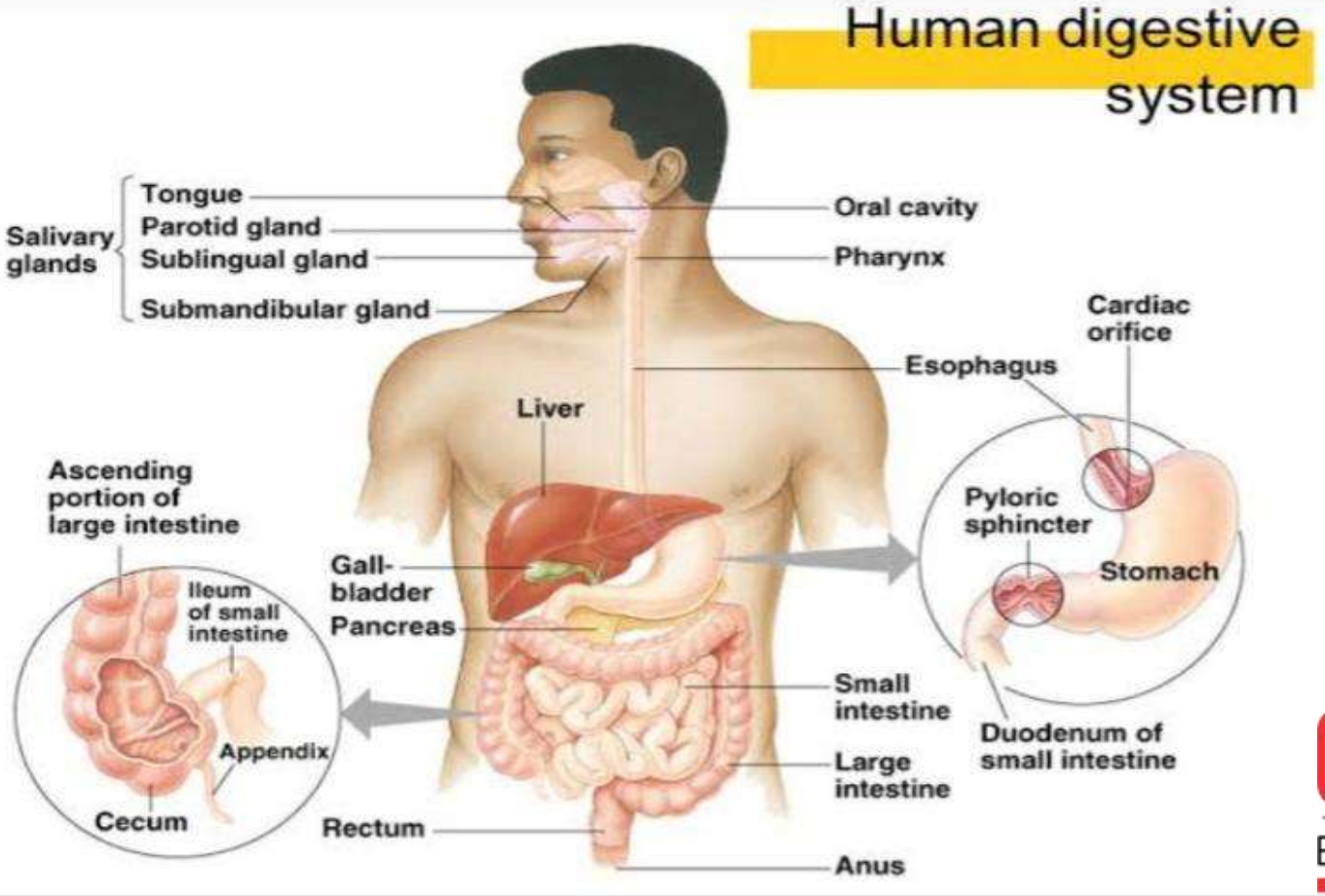
MICRO-NUTRIENTS

- Vitamins - water and fat soluble vitamins play important roles in many chemical processes in the body.

- Water - essential to normal body function - as a vehicle for carrying other nutrients and because 60% of the human body is water.
- Minerals - those inorganic elements occurring in the body and which are critical to its normal functions.
- Roughage (Fiber) - the fibrous indigestible portion of our diet essential to health of the digestive system

DIGESTIVE SYSTEM IN HUMANS

The human digestive system consists of the **alimentary canal and secretory glands.**
It consists of the-
(i) buccal cavity, (ii) oesophagus, (iii) stomach, (iv) small intestine, (v) large intestine ending in rectum and (vi) anus



PROCESS OF DIGESTION

1. **Ingestion –** Ingestion refers to the intake of food. Ingestion takes place through Mouth
2. **Digestion –** Digestion refers to the breakdown of ingested food into simpler forms.

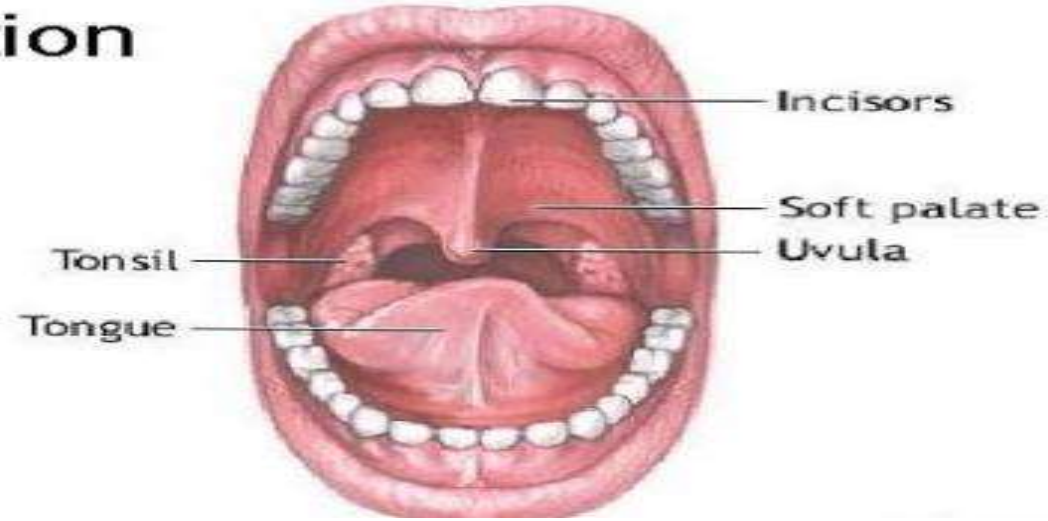
3. **Absorption –** Absorption refers to the process in which digested food is absorbed into the body fluids (Blood & lymph). Small intestine plays a major role in Absorption.

4. **Assimilation –** Assimilation refers to the process in which absorbed food is transported to different cells of the body.

5. **Egestion –** Egestion refers to the process of removal of undigested food from the body. Large intestine plays a major role in Egestion
6. https://www.youtube.com/watch?v=CPLKIvNN1aM

Oral Cavity (Mouth)

Teeth, tongue and salivary glands begin mechanical and chemical digestion



Saliva is a kind of digestive juice secreted by the salivary glands.
It contains salivary amylase enzymes that helps in break down and softening of food.
It is produced by salivary glands in the mouth and is the first step for digestion of food.
It also contains antibacterials compounds that help prevent tooth decay for bacterial purposes.

Functions of Saliva

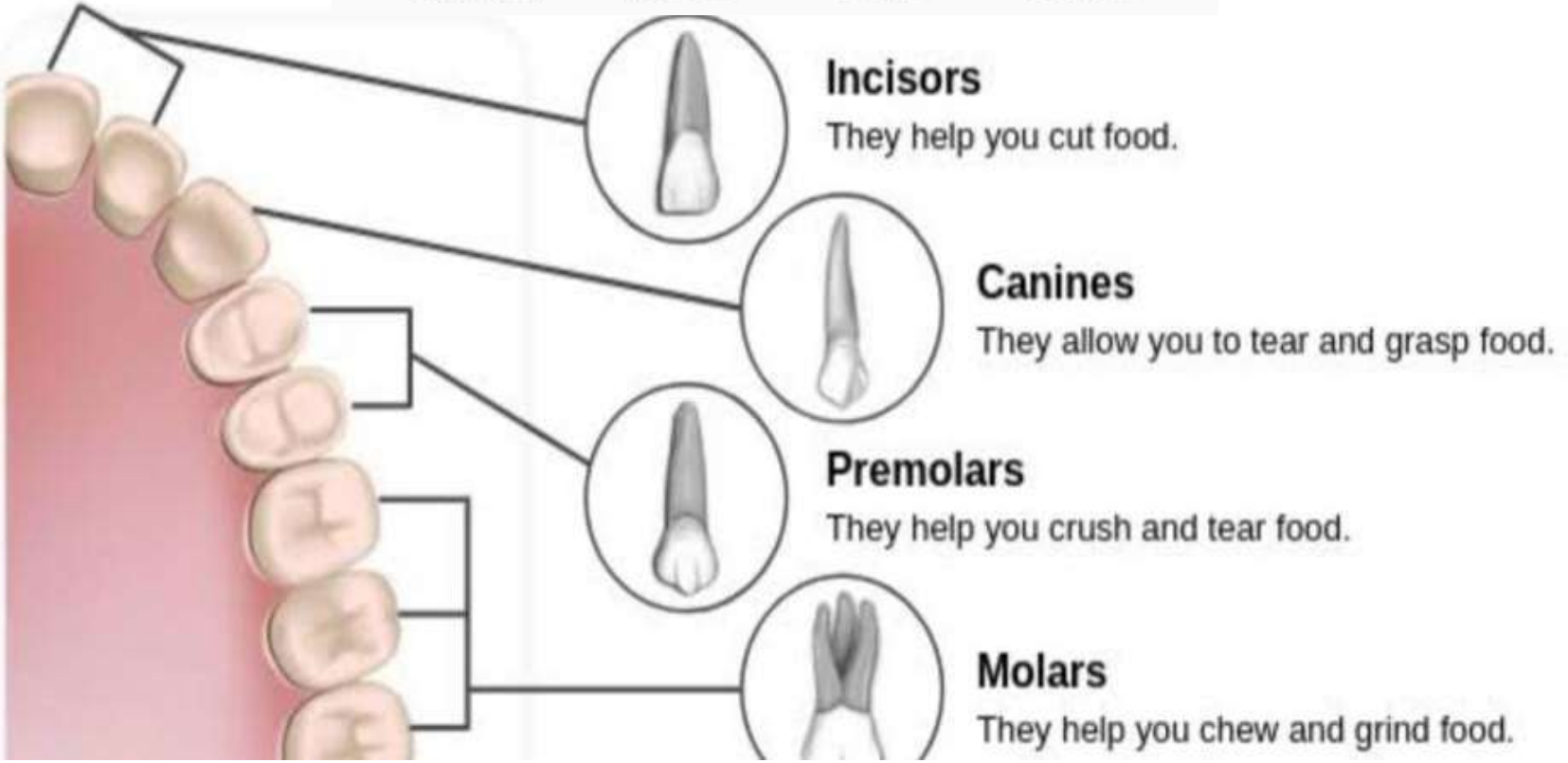
1. It moistens and lubricates the mouth cavity and the tongue to make speaking and swallowing easy.
2. It cleans the mouth and destroys germs.
3. The saliva binds the food particles and makes it into a mass called the **bolus**.
4. Digestion begins in the mouth. Saliva contains an enzyme (amylase) which helps in the breakdown of starch to simple sugars (= maltose).

Tongue

The tongue is a fleshy muscular organ attached at the back to the floor of the mouth. It helps in several ways :

1. Helps in tasting the food.
2. Helps in mixing the watery secretion (saliva) with the food.
3. Manipulates the food while chewing.
4. Helps in swallowing the food.
5. Helps in cleaning the teeth when food particles are stuck to it.
6. Helps in speaking.

TYPES OF TEETH



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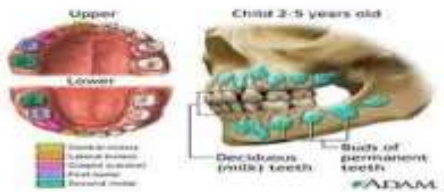
Milk teeth



Permanent teeth

Milk teeth (Deciduous teeth)	Permanent teeth
Start erupting after 6 months of birth and appear between 6 to 24 months	Begin to replace milk teeth in the 6 th year of age and usually completed by 24 years
Smaller, weaker and temporary	Stronger and permanent
3 types (incisor, canine and molars) 8 incisors + 4 canines + 8 molars	4 types (incisor, canine premolars and molars) 8 incisor+ 4 canine+ 8 premolars + 12 molars
20 in number, 10 each in the upper and lower jaw	32 in number, 16 each in the upper and lower jaw
Dental formula of milk teeth 2102 2012	Dental formula of permanent teeth 2123 2123

HOME ASSIGNMENT

1. Give one instant source of carbohydrate?
2. How many types of teeth do we have ? Which teeth do you use for piercing and tearing?
3. Where is saliva produced? What is the function of the human tongue?
4. What is the difference between milk teeth and permanent teeth.
5. What do you understand by the alimentary canal? Name the various parts of the alimentary canal and the associated glands.
6. Write the functions of the following organs in the digestive system: mouth, stomach, liver, small intestine, pancreas

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DIGESTIVE SYSTEM

SUBJECT-BIOLOGY

CHAPTER NO- 4

Parts of digestive system - Oesophagus, Stomach, Small Intestine

PERIOD-**2**

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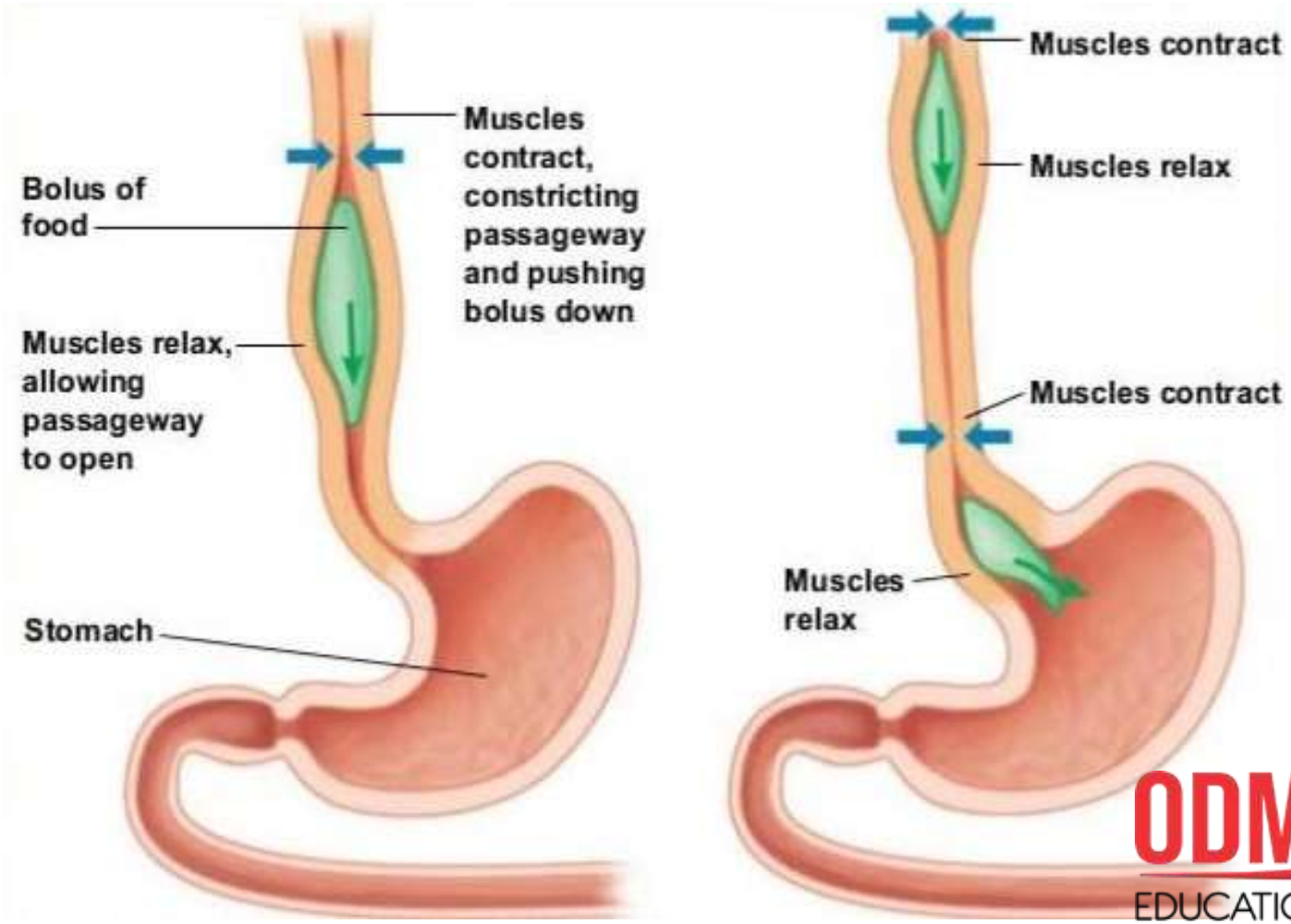
LEARNING OBJECTIVES

Students will be able to-

- **explain the overall function of the digestive system**
- **Identify the organs and their Specific functions.**
- **Describe the process of digestion in the associated organs.**
- **Draw labelled diagram of the Digestive system in humans.**

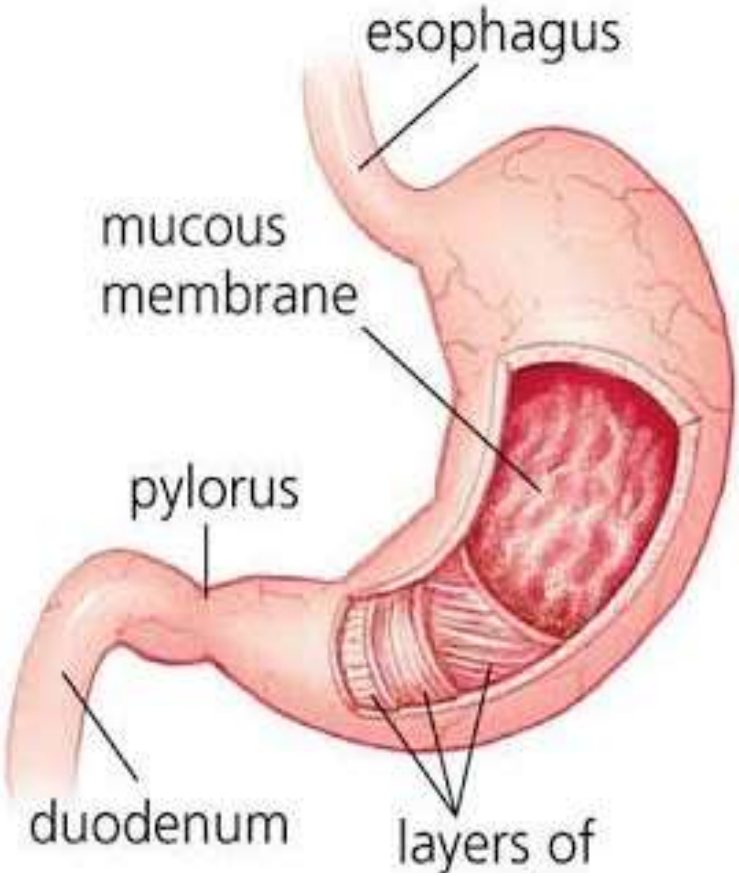
Esophagus

The esophagus is **a muscular tube that connects the mouth and the stomach**. Rings of muscle (sphincters) in the upper and lower portions contract and relax to allow food and liquid to pass by peristalsis.



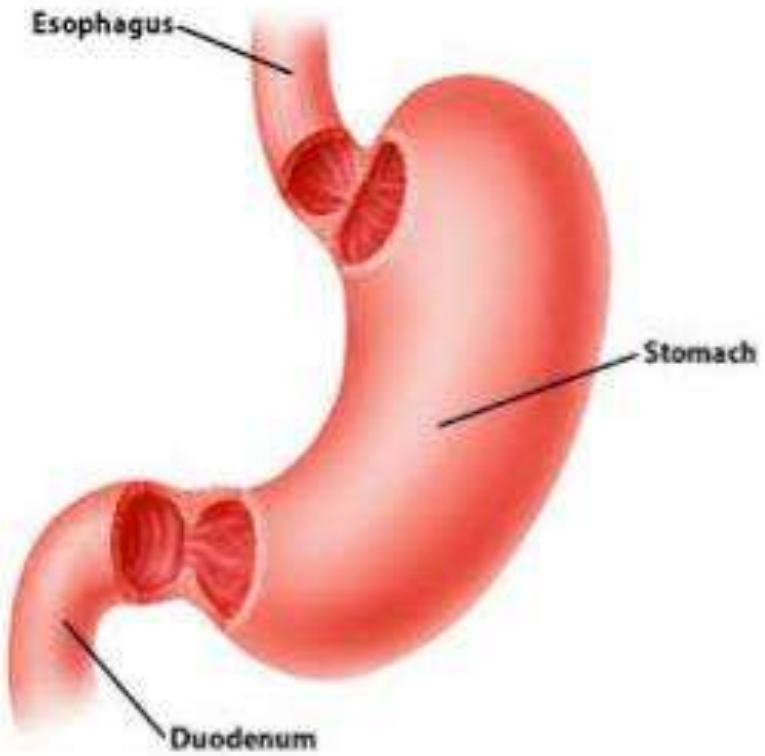
STOMACH

- Hollow, saclike organ enclosed in a muscular wall (3 layers of muscles)
- Function of the stomach is:
  - Continue to <u>breakdown food</u>
  - <u>Store food</u> until it's ready to enter small intestine



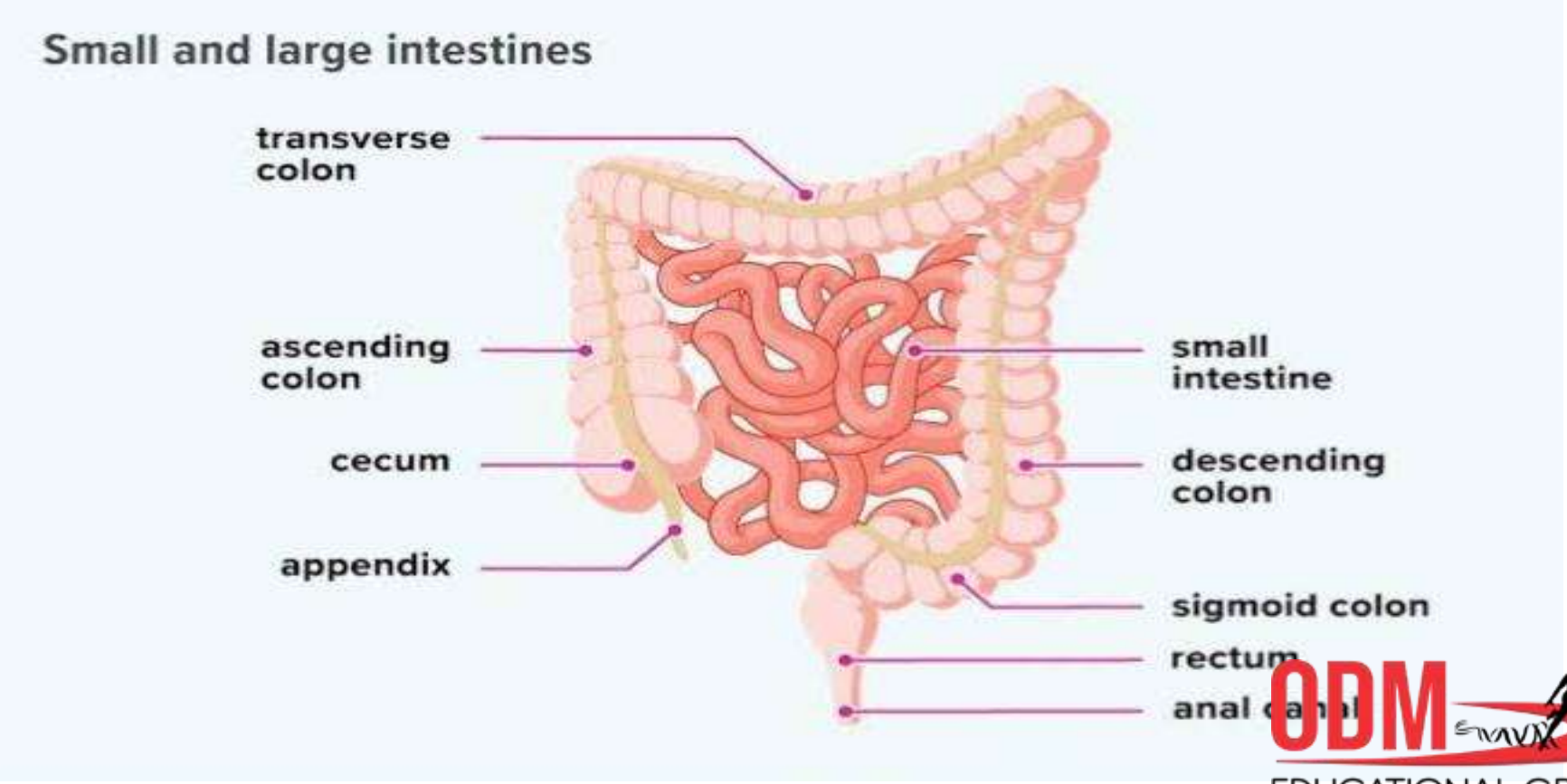
STOMACH

- In your stomach, mechanical and chemical digestion are occuring.
- First, your stomach muscles contract creating a churning motion to break down your food.
  - THINK! – Mechanical or Chemical Digestion?
- Then, your stomach secretes an enzyme called pepsin as well as hydrochloric acid to break down food.
  - THINK! – Mechanical or Chemical Digestion?
- Both mechanical and chemical digestion turn your food into an acidic liquid called chyme.



INTESTINE

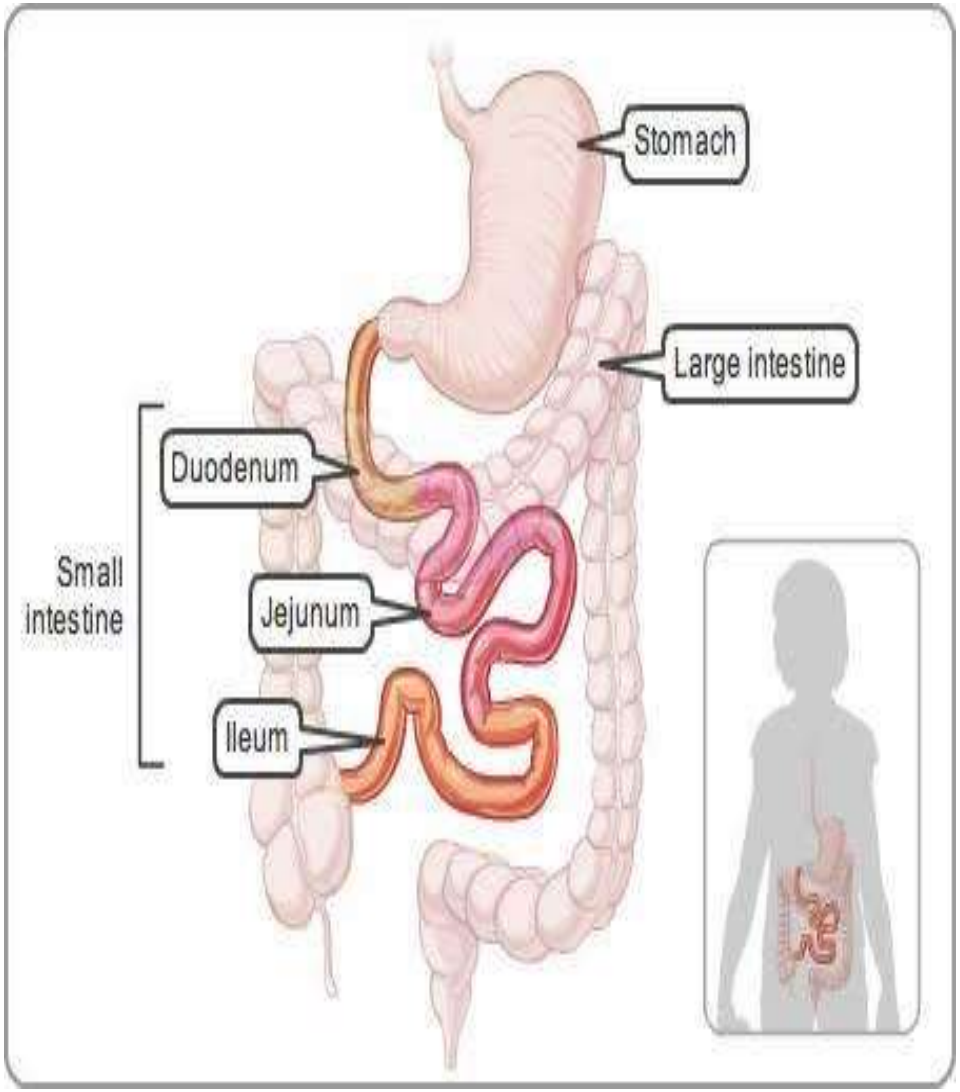
The small intestine is about 20 feet (6 meters) long and folds many times to fit in the abdomen.



SMALL INTESTINE

The duodenum is the first segment of the small intestine. It's largely responsible for the continuous breaking-down process.
The jejunum and ileum lower in the intestine are mainly responsible for absorption of nutrients into the bloodstream.

The ileum is the final section of the small intestine and contains numerous finger-like projections called Villi. Villi absorb the nutrients after complete digestion of food.



HOME ASSIGNMENT

- 1. Explain briefly how the food passes through esophagus.
- 2. Digestion starts in Stomach. State True or False.
- 3. How is the reverse passage of food Prevented?
- 4. Name the three parts of small intestine. Describe their roles in digestion.
- 5. Describe in detail what happens to food in the
  (a) stomach
  (b) small intestine

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DIGESTIVE SYSTEM

SUBJECT-BIOLOGY

CHAPTER NO- 4

Parts of digestive system – Pancreas and Liver,Large Intestine and Egestion

PERIOD-**3**

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LEARNING OBJECTIVES

Students will be able to-

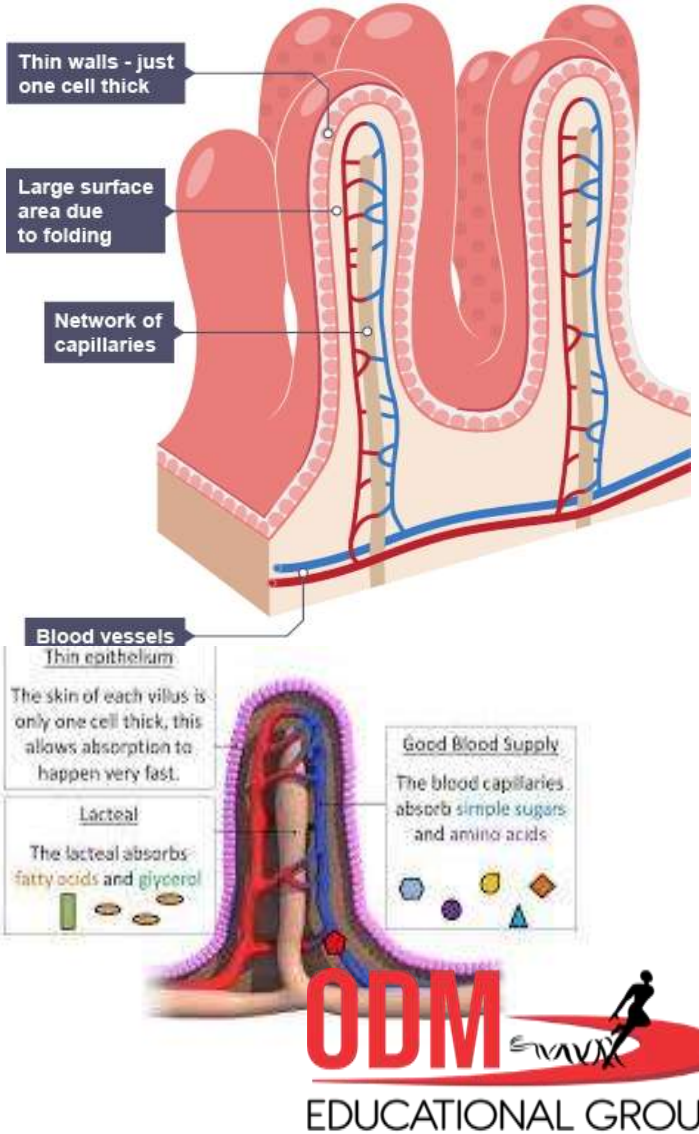
- **Identify the different parts of large intestine.**
- **know the associated glands and their functions.**
- **understand the process of absorption of digested food.**
- **locate and draw well labeled diagram of the glands.**

WARM UP QUESTIONS

1. How the food passes through esophagus?
2. Digestion starts in Stomach. State True or False.
3. How is the reverse passage of food Prevented?
4. Name the three parts of small intestine.

ABSORPTION IN SMALL INTESTINE

The villi of the small intestine project into the intestinal cavity, greatly increasing the surface area for food absorption and adding digestive secretions.



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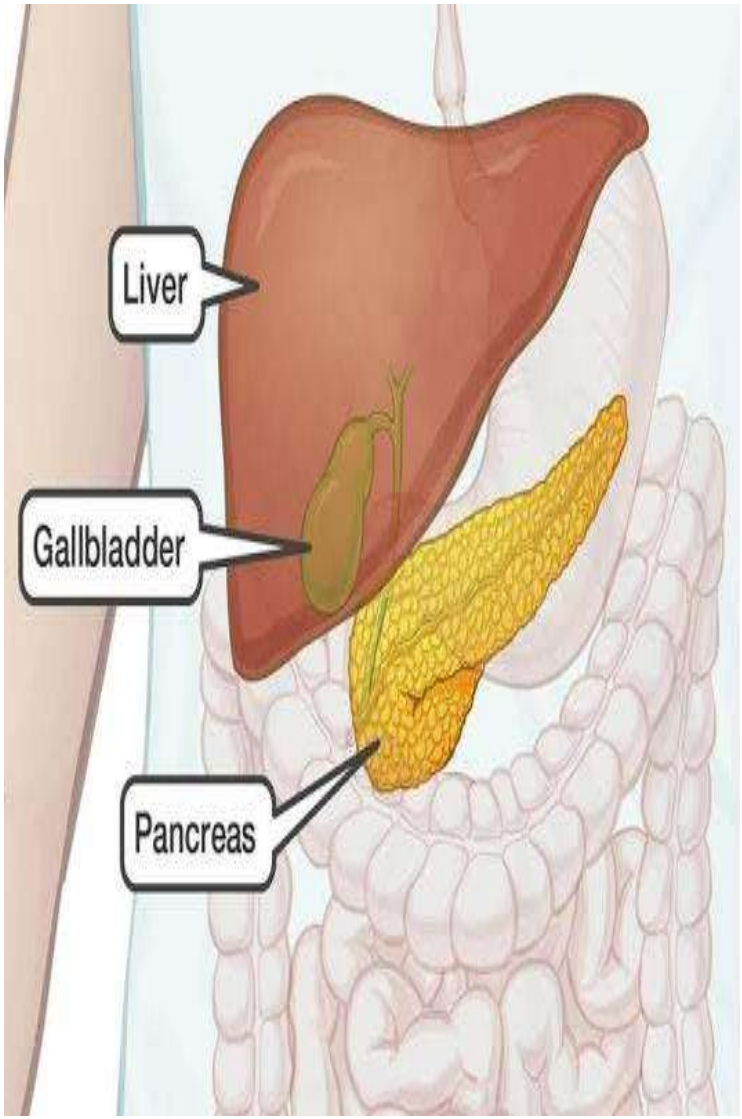
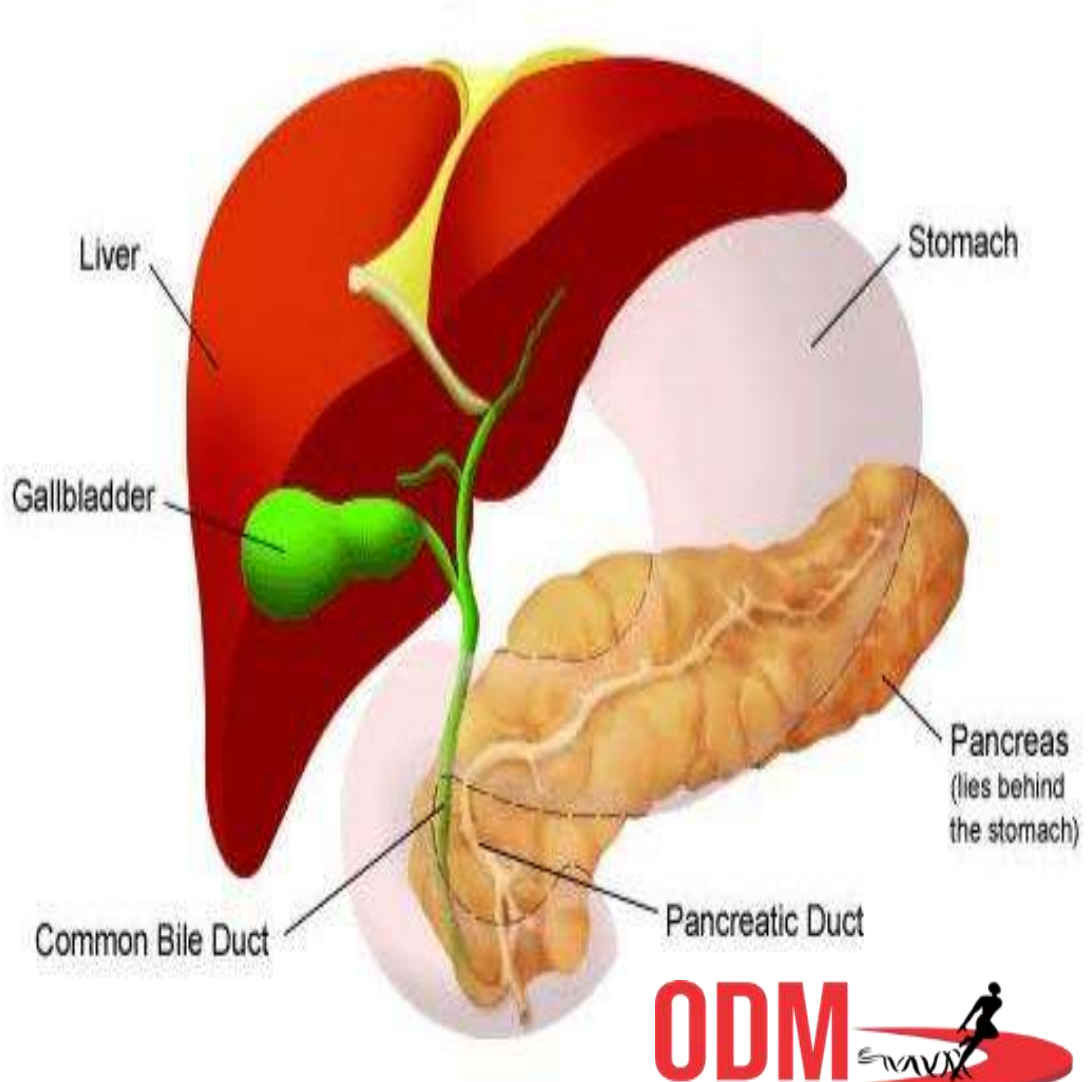
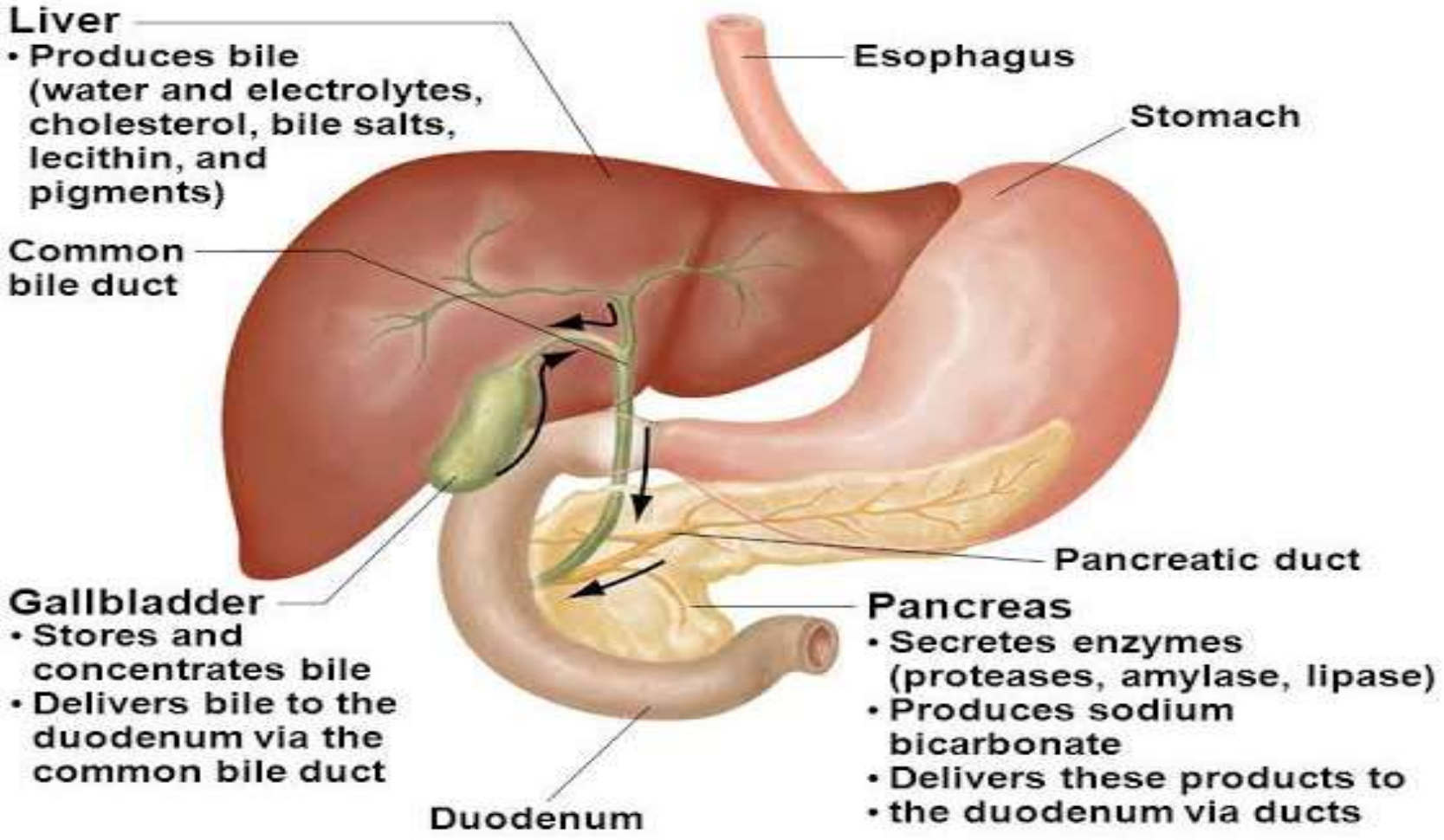
Pancreas and Liver





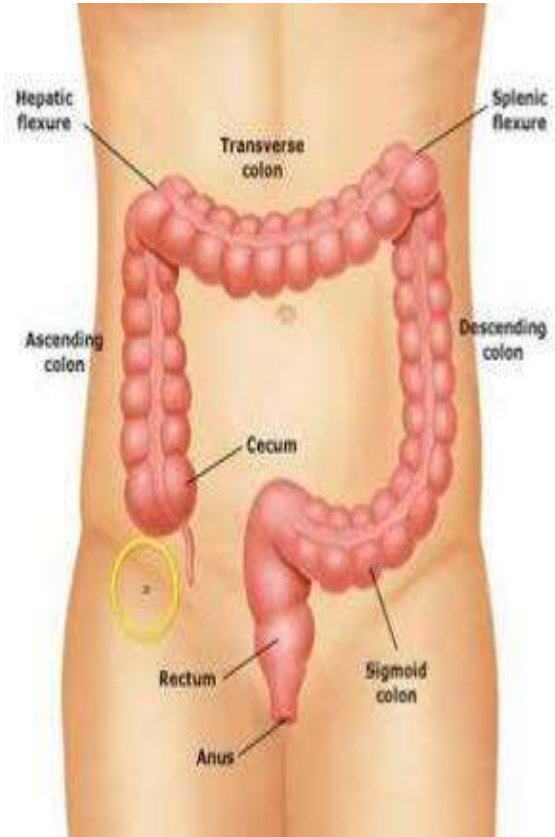
FUNCTIONS

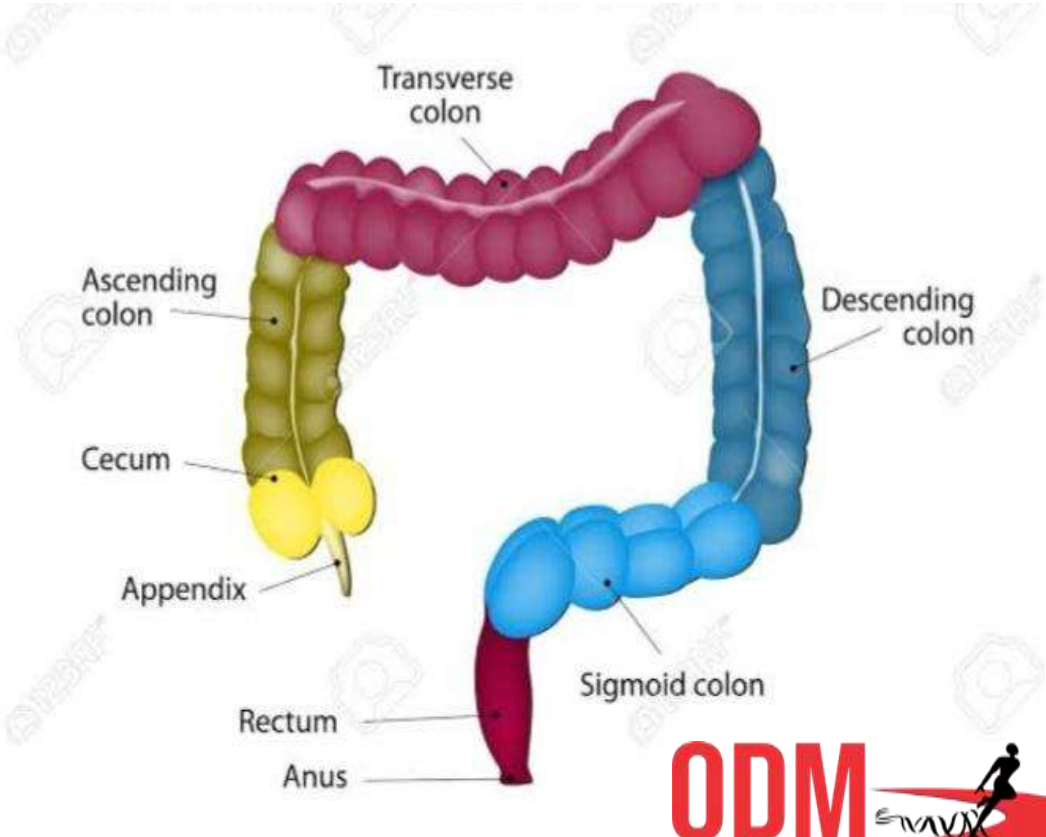


LARGE INTESTINE

The large intestine consists of the caecum, colon, rectum and anal canal. It is about 1.5 metres long and has an average diameter of about 6 cm.
The major functions of the large intestine are

1. recovery of water and electrolytes,
2. Formation and storage of faeces
3. fermentation of some of the indigestible food matter by bacteria.





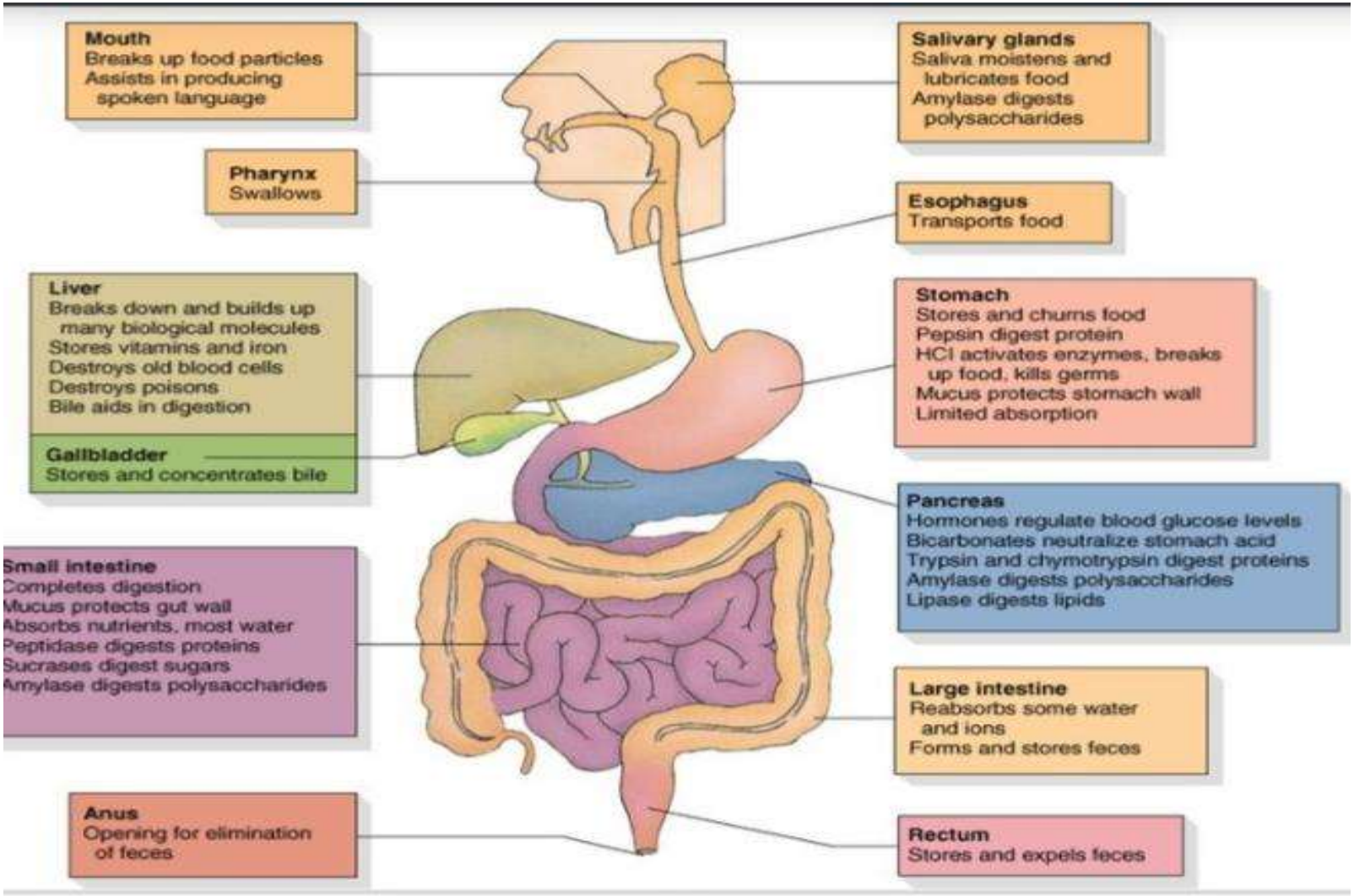
EGESTION

Ingestion	taking food into the mouth	mouth
Digestion	breaking down food into soluble molecules	mouth stomach, duodenum, ileum
Absorption	taking products of digestion into bloodstream	ileum
Assimilation	e.g. respiration, making proteins	cells of the body
Egestion	removal of undigested food	anus

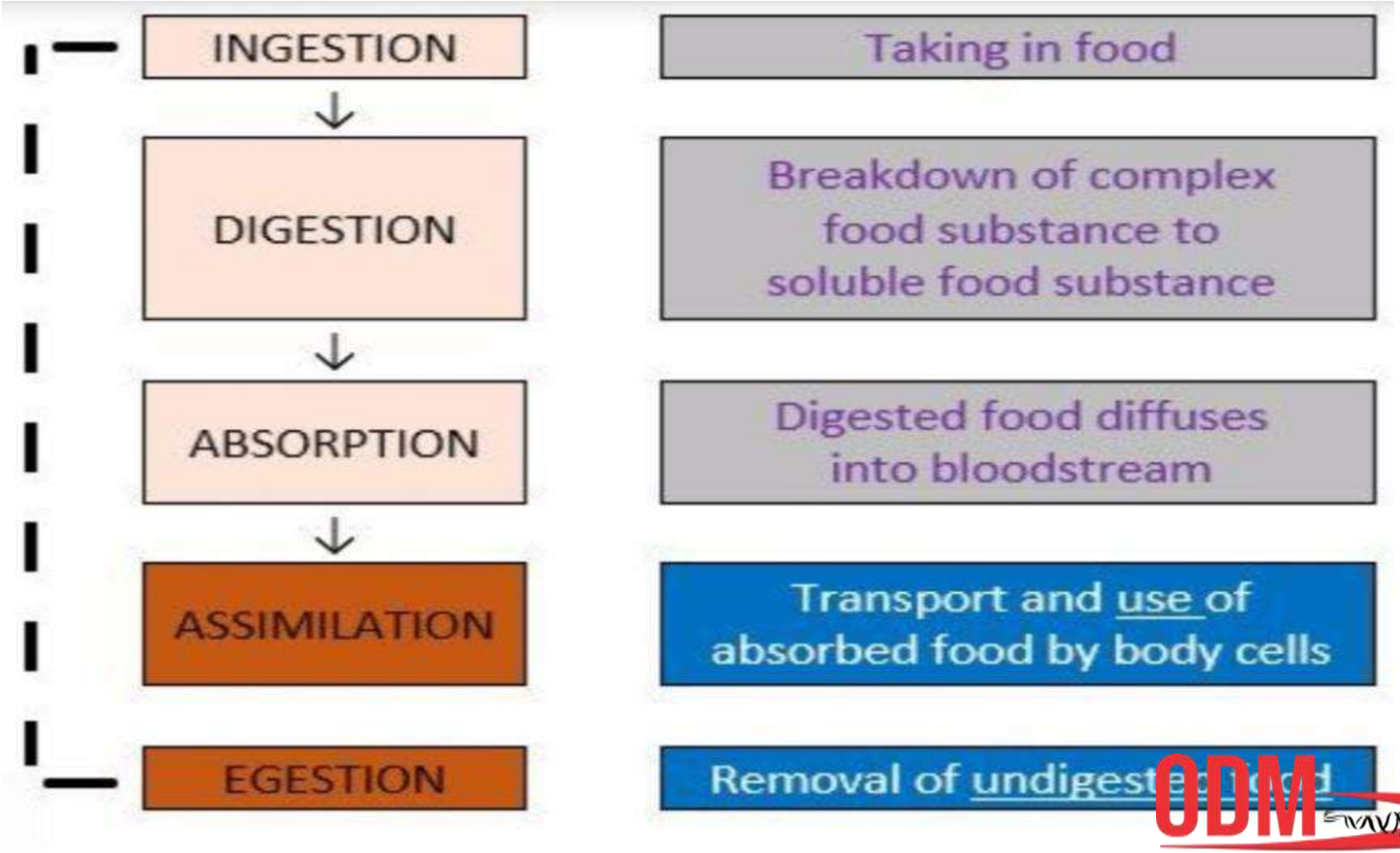
Rectum

- Rectum holds waste and other unnecessary materials
- Last four or five inches of the digestive tract

RECAPITULATION



PROCESSES OF DIGESTION



HOME ASSIGNMENT

1. The major functions of the digestive system are to digest food and to absorb nutrients into the _____.
2. Where does most of the digestive process take place?
3. What is the function of Bile Juice secreted by Liver?
4. Where does absorption of water takes place?
5. Give the functions of the following:

   A. Villi. B.Liver C. Pancreas

6. Can a person live without gall bladder. Give reason in support of your answer.

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DIGESTIVE SYSTEM

SUBJECT-BIOLOGY

CHAPTER NO- 4

TOPIC: **Structure of Tooth, The Aching Tooth, Care of The Tooth**

PERIOD-4

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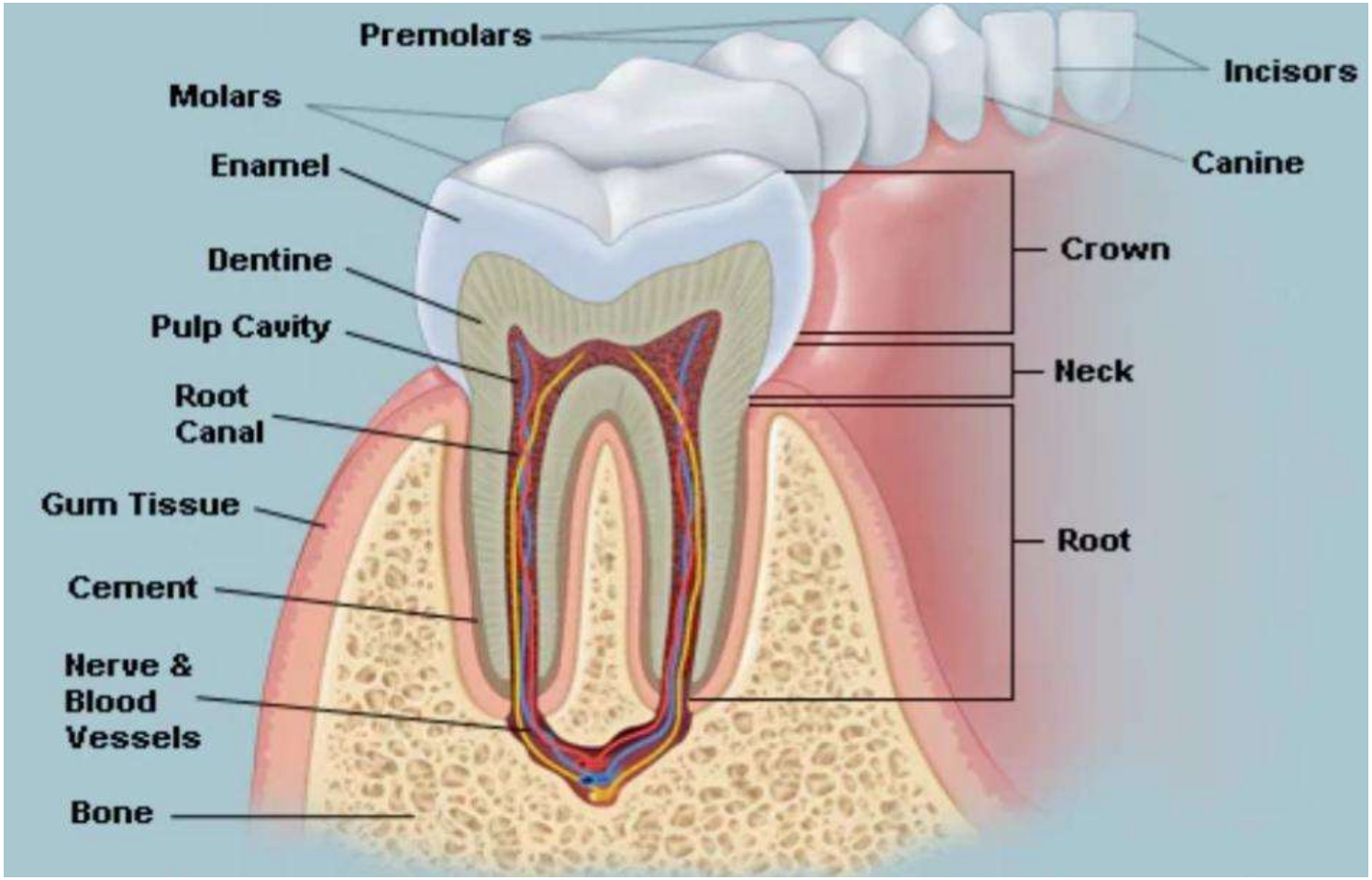
LEARNING OBJECTIVES

Students will be able to:

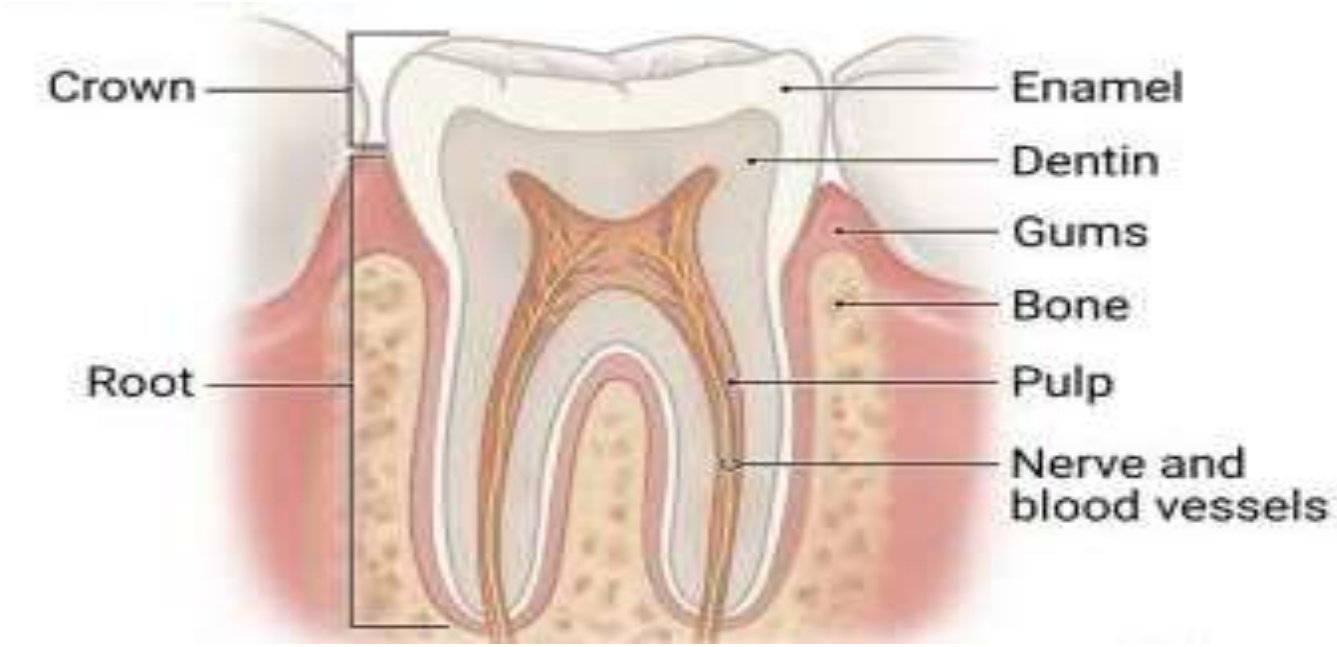
- Learn the structure of tooth and function of each part.
- Understand the Process of plaque formation and tooth decay.
- Apply the measures to prevent tooth decay.

STRUCTURE OF TOOTH



Parts of the teeth :

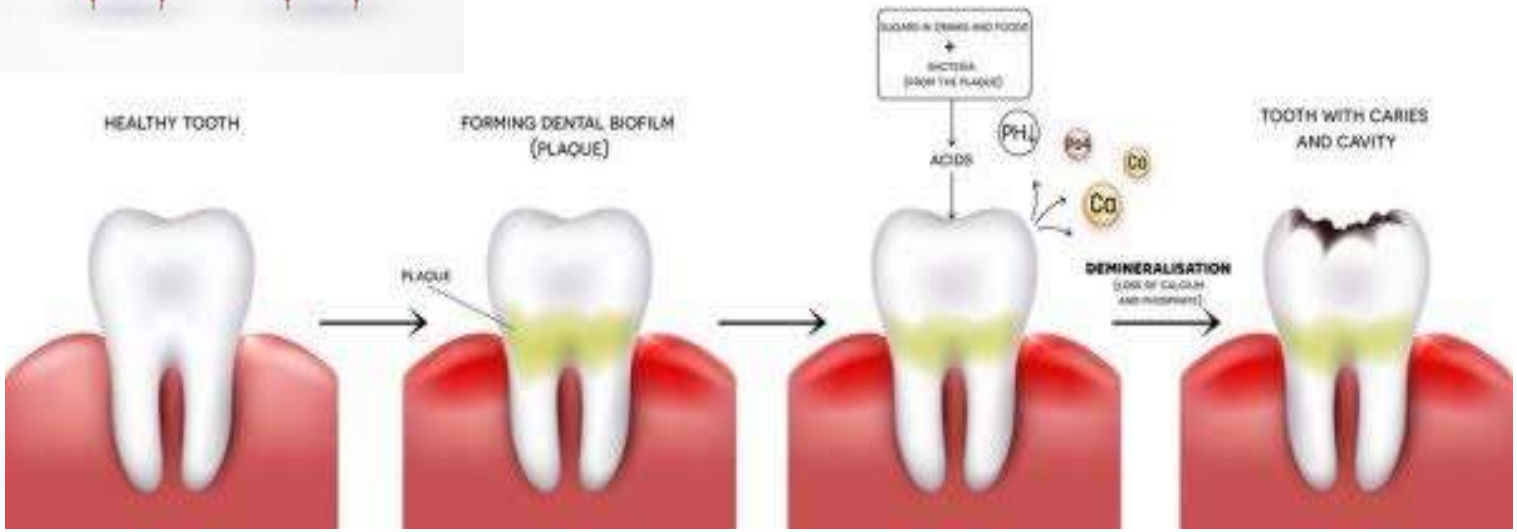
• Enamel: The hardest, white outer part of the tooth. Enamel is mostly made of calcium phosphate, a rock-hard mineral.
• Dentin: A layer underlying the enamel. It is a hard tissue that contains microscopic tubes. When the enamel is damaged, heat or cold can enter the tooth through these paths and cause sensitivity or pain.
• Pulp: The softer, living inner structure of teeth. Blood vessels and nerves run through the pulp of the teeth.
• Cement: A layer of connective tissue that binds the roots of the teeth firmly to the gums and jawbone.



THE ACHING TOOTH

Dental plaque is a sticky, colorless or pale yellow film that is constantly forming on the teeth. When saliva, food and fluids combine, plaque - which contains bacteria - forms between the teeth and along the gum line.

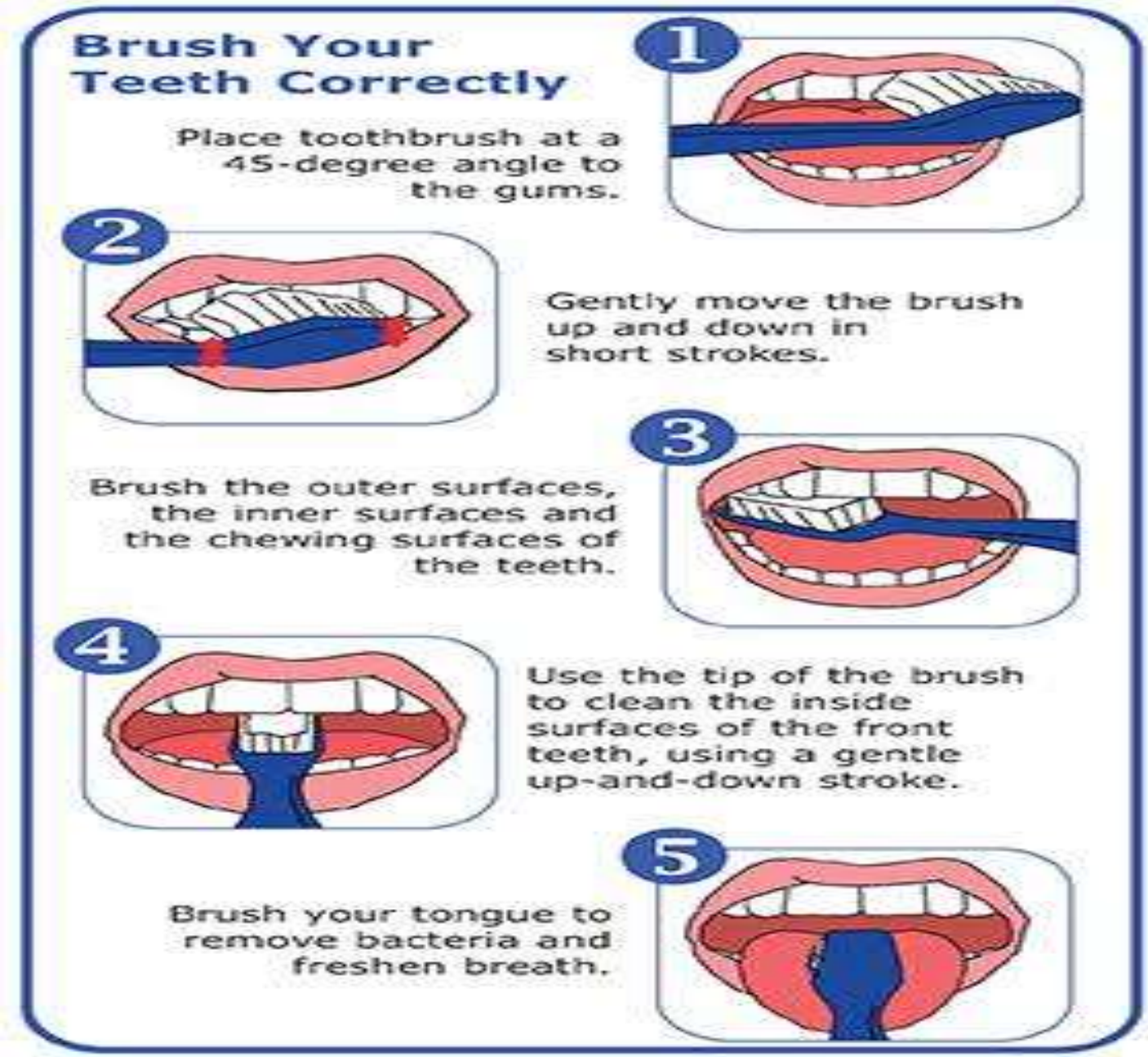
Dental plaque begins forming on teeth 4-12 hours after brushing, which is why it is so important to brush thoroughly at least twice a day and floss daily.



CARE OF THE TOOTH

- Floss at least once per day. Flossing removes plaque between the teeth and on the gums.
- Brush your teeth twice a day with a soft-bristled toothbrush.
- Use fluoride toothpaste. It strengthens tooth enamel and helps prevent tooth decay.
- Replace your toothbrush every 3 to 4 months. A worn-out toothbrush will not clean your teeth as well.
- Eat a healthy diet.
- Eating and drinking a lot of sweets increases your risk of cavities. If you do eat or drink sweets, brush your teeth soon after.
- Keep dentures, retainers, and other appliances clean. This includes brushing them regularly.
- Schedule regular checkups with your denti

Brushing the Teeth correct way:



HOME ASSIGNMENT

1. Draw a well labeled diagram of a tooth and label its parts.
2. What is the enamel made up of?
3. What do you mean by plaque? How does it causes tooth decay?
4. List out the foods that cause tooth decay.
5. Mention any 4 ways by which we can care for our teeth and prevent dental caries.

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DIGESTIVE SYSTEM

SUBJECT-BIOLOGY

CHAPTER NO- 4

TOPIC: **QUESTION ANSWERS**

PERIOD-5

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EXERCISE

Multiple Choice questions:

1. Tick (✓) the appropriate answer.

(i) The teeth which help in tearing the food are the

(a) Incisors ☐ (b) Canines ✓

(c) Premolars ☐ (d) Molars ☐

(ii) Last molar tooth in human beings is called

(a) Adult tooth ☐ (b) Wisdom tooth ✓

(c) Child tooth ☐ (d) Elder's tooth ☐

(iii) The hardest substance in your body is

(a) Dentine ☐ (b) Bone ☐

(c) Cement ☐ (d) Enamel ✓

(iv) Saliva converts starch into

(a) Glucose ☐ (b) Sucrose ☐

(c) Maltose ✓ (d) Lactose ☐

(v) Proteins of the milk are converted into curd by the enzyme

(a) Trypsin ☐ (b) Rennin ✓

(c) Pepsin ☐ (d) Erepsin ☐

(vi) Bile juice is produced by

(a) Stomach ☐ (b) Liver ✓

(c) Pancreas ☐ (d) Gall bladder ☐

Short Answer questions

1. Write True or False in the following statement

(i) Molar help in cutting and tearing food. (FALSE)

(ii) Carbohydrates are digested into glucose. (TRUE)

(iii) Proteins are digested into fatty acids. (FALSE)

2. Fill in the blanks

(i) The teeth called canines are a total in four in number on the sides of incisors.

(ii) Pharynx is a common opening of food pipe and wind pipe.

(iii) Molars are meant for crushing the food.

(iv) Incisors are used for biting and cutting the food.

(v) The canines are used for tearing the food.

(vi) The premolars and molars are used for crushing and grinding the food.

(vii) In an adult human, there are a total of 32 teeth.

(viii) The human teeth appear in two sets, the first set is called temporary teeth which consists of only 20 teeth.

3. Name the following:

(i) End product of starch after digestion, Maltose

(ii) The organ where protein digestion begins, Stomach

(iii) The organ into which the pancreatic juice and the bile juice are Poured, Small intestine

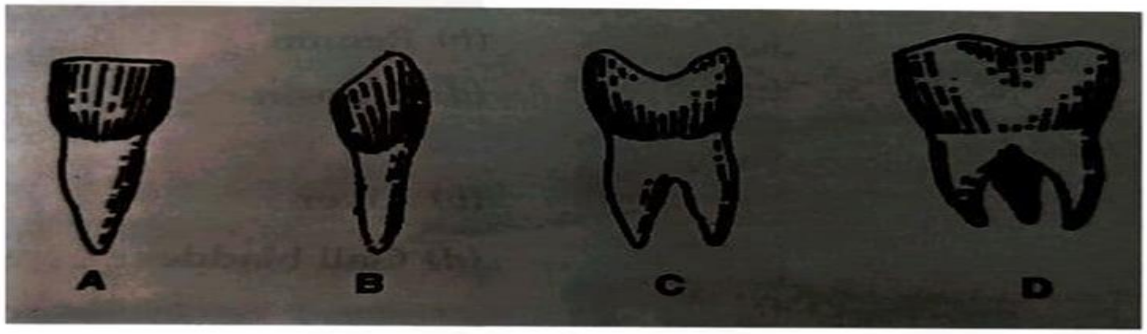
(iv) The enzyme which digest fat in ileum, Lipase

(v) The simplest form of carbohydrates, Glucose

(vi) The part of elementary canal where water from the undigested food is absorbed, Large Intestine

(vii) The end product of protein digestion, Amino acids

4. Identify and name the four types of teeth shown below and state their functions.



A. Incisor: These are used for biting and cutting the food.
B. Canines: These are used to tear the food.
C. Premolars: These help in crushing and grinding the food.
D. Molars: These help in finer crushing and grinding of ingested food.

5. State whether the following statements are True or False.

(i) Wisdom tooth appears at the age of 5-6 years when the child starts going to school. (FALSE)
(ii) The temporary set of teeth includes incisors, canines and premolars Only. (TRUE)
(iii) The ducts from the salivary glands open into the duodenum. (FALSE)
(iv) Saliva changes starch into maltose. (TRUE)

6. Fill in the blanks in the table (1-5) by selecting the suitable names of substances from the list given below:
[steapsin, peptones, fatty acids, proteoses, protein]

Digestive enzymes	Acts on	to from
(i) Pepsin	Proteins	peptones and proteoses
(ii) Steapsin	fats	fatty acids

7. (i) Name the juice secreted by the liver – Bile

(ii) Name the organ where this juice is temporarily stored – Gallbladder

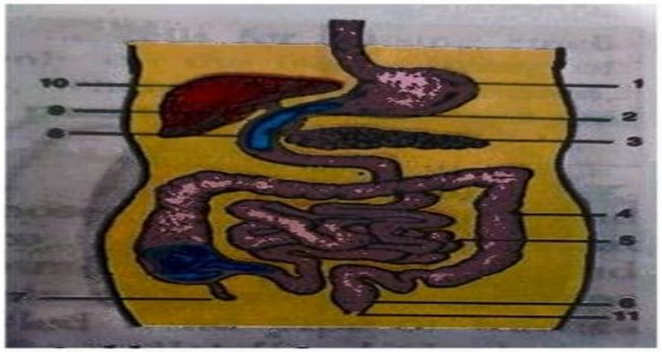
(iii) What is the main function of this juice?
The main function of bile is emulsification in which it breaks down fats into tinny droplets.

8. Name three enzymes found in the pancreatic juice and mention their functions.
The three enzymes found in the pancreatic juice are
(i) Amylase : This acts on the starch and convert it into maltose.
(ii) Trypsin: This converts proteins and peptones into peptides.
(iii) Lipase: This converts emulsified fats into fatty acids and glycerol.

9. Name the three regions of the large intestine.
The three regions of the large intestine are Caecum, colon and Rectum.

10. Give alongside the diagram of the human alimentary canal.
(i) Name the parts 1-11 indicated by guidelines.

1. Stomach
2. Bile duct
3. Pancreas
4. Large intestine
5. Small intestine
6. Rectum
7. Appendix
8. Pancreatic duct
9. Gall bladder
10. Liver
11. Anus



(ii) State the function of the juice secreted by part 1

The juice secreted by the stomach is also known as gastric juice, which kill the germs which may have entered with the food. This also prevents rotting of food during its long stay in stomach and it activates the enzyme pepsin.

(iii) State the function of three enzymes found in the juice secreted by part 3.

The juice secreted by part 3 is known as pancreatic juice. The three enzymes found in the pancreatic juice are

a) Amylase : This acts on the starch and convert it into maltose.
b) Trypsin: This converts proteins and peptones into peptides.
c) Lipase: This converts emulsified fats into fatty acids and glycerol.

Long Answer questions

1. Define the term nutrition.

The process by which all organisms synthesize their food and convert it into simpler substance, so that it can be absorbed and utilized by the cells of the body is called nutrition. The whole process of nutrition is conducted through five steps. Ingestion, digestion, absorption, assimilation and egestion.

2. What is the role of liver and pancreas respectively in the digestion of Food?

The liver produces a greenish yellow fluid called bile, which breaks down fats into tiny droplets by emulsification. The pancreas secrets pancreatic juice which contains enzymes like amylase, trypsin and lipase which help in the digestion of carbohydrates, proteins and fats respectively.

3. Name the digestive juice secreted by the stomach and give its function.

The digestive juice secreted by the stomach is known as gastric juice. Its functions are:

(i) It kills the germs which may have entered with the food.
(ii) This also prevents rotting of food during its long stay in stomach.
(iii) It activates the enzyme pepsin.

4. Answer the following questions.

(i) Name the type of teeth present in humans.

Based on their different shapes and function human teeth are of four kinds as following.

a) Incisors: These are chisel shaped and used for biting and cutting the food.
b) Canines: These are pointed teeth and used for tearing the food.
c) Premolars: These help is crushing and grinding the food.
d) Molars: These have broad uneven surface and used for finer crushing and grinding of food.

(ii) How the small intestine best suited for the digestion and absorption of food?

The last part of the small intestine called ileum contains glands which produces intestinal juice. This juice contains enzymes. Due to the action of these enzymes the food completely digested in the ileum. The inner lining of the small intestine contains a large number of tinny finger like projections called villi. These villi greatly increase the inner surface area for absorption of digested food. The villi absorbs the amino acids and glucose to pass them into the blood system. The fatty acid pass into special tubes called lymph vessels. Vitamins and mineral salts are directly absorbed through the walls of the intestine.

(iii) What do you mean by absorption of food?

The digested food in the form of glucose, amino acids, fatty acids, glycerol, vitamins and minerals are passed into the blood system through villi, lymph vessels and walls of the intestine. This is known as absorption of food.

5. Define the following terms: Egestion, digestion, assimilation.

Egestion: The process of eliminating the undigested food through the anus is called egestion.

Digestion: Digestion is the process by which the complex chemical compounds present in the food are broken into simpler substances that are readily absorbed and utilized by the body.

Assimilation: It is the utilization of the digested food or nutrients by the body cells.

6. Rewrite the following parts of the human alimentary canal in their correct sequence. Stomach, Oesophagus, large intestine, Small intestine.

Oesophagus, Stomach, Small intestine, Large intestine

7. What is the fate of excess glucose in our body?

Liver takes the excess glucose and stores it in the form of glycogen. When we need energy later, like in between meals the liver will release glucose back into the blood stream.

8. Define the term digestion.

Digestion is the process by which the complex chemical compounds present in the food are broken into simpler substances that are readily absorbed and utilized by the body.

9. State the four ways in which saliva is useful to us.

The four ways in which saliva is useful to us are:

a) It moistens and lubricates the mouth cavity and the tongue to make speaking and swallowing easy.
b) It cleans the mouth and destroys the germs.
c) The saliva binds the food particles and makes it into a mass called as bolus.
d) Saliva contains amylase which helps to break starch into simple sugars.

10. Food are classified into three groups on the basis of the functions they perform in our body. Name these three groups, and briefly state their functions. Also give two sources of each.

The Three groups of food on the basis of their functions are

a) Energy giving food – These food give us energy to do work. Carbohydrate and fats present in the food provide us energy. The main source of these food are Rice, potato, oil and butter.

b) Body building food – These food help in the growth and repair of damaged cells and tissues. These food contain proteins. The main source of these food is Pulses. Milk and egg etc.

c) Protective food – These food help our self-keeping healthy and diseases free. These food contain minerals and vitamins. The main source of these food are vegetables and fruits.

Extra Questions and Answers

A. Objective Questions

1. Fill in the blanks:

a) Salivary amylase acts on starchy food and change it into maltose.

b) The food we eat passes through the alimentary canal.

c) The alimentary canal starts from the mouth and ends at the anus.

d) The word cell is derived from the Latin word cella.

e) The food canal together with the glands forms the digestive system.

f) The temporary teeth consists of 20 teeth.

g) Two teeth on either side of the canines are premolars.

h) Molar teeth are broad in shape and have uneven flat surface.

i) Tongue manipulates the food while chewing.

J) Saliva is a fluid containing water, salts and slimy mucus.

k) Saliva contains an enzyme called amylase which converts starch into maltose.

l) The Oesophagus is a long and narrow tube which runs from back of the throat, down through the chest to open into the stomach.

m) The food moves through the oesophagus by peristalsis.

n) The gastric juice contains water, hydrochloric acid and an enzyme Pepsin.

o) Pepsin converts proteins into a simpler compound called peptones.

p) In the stomach the food changes into a pulp like thick paste called chyme.

q) The short upper 'U' shaped part of the small intestine is called duodenum.

r) The pancreatic juice contains amylase, trypsin and lipase.

s) Intestinal juice contains erepsin, maltase, sucrase and lactase.

t) The three regions of large intestine are caecum, colon and rectum.

u) Chocolates and sweet promote the growth of bacteria in the teeth.

2. Give one word for the following.

a) The food which provides us with all the necessary substances – Nutritious food.

b) The last molar on each side of each jaw is called – Wisdom tooth.

c) The saliva binds the food particles and makes in into a mass called – Bolus.

d) The slow wave like movement seen in the walls of oesophagus due to the contraction and relaxation of its muscles – Peristalsis.

e) The process in which bile juice breaks down fats to tinny droplets – Emulsification.

f) Bile is stored in – Gull Bladder.

g) This converts starch into maltose – Amylase

h) This converts proteins and peptones into peptides – Trypsin

i) This converts emulsified fats into fatty acids and glycerol – Lipase.

j) The second part of the small intestine is called – Jejunum.

k) The tinny finger like projections in the small intestine – Villi

l) The fatty acids pass through a special tube called – Lymph vessels

m) This part of the small intestine serves functions both for the digestion and absorption of the digested food. – Ileum

n) The top portion of the tooth – Crown

o) The white hard layer which surrounds the crown – Enamel

p) The hardest substance in the body – Enamel

q) The bone like hard substance just below the enamel – Dentine

r) Dentine has a hollow space filled with soft material called – Pulp

s) The lower part of the tooth fixed with the jaw – Root

t) The process of eliminating the undigested food through the anus – Egestion

u) The last part of the large intestine about 15cm long is called – Rectum

v) The undigested waste stored in the rectum is called – Faeces

w) Sticky substance that forms on the tooth – Plaque

B. Short Questions And Answers.

1. Why is small intestine long and narrow?

The small intestine is long and narrow so that the food can be remained in the small intestine for about 3 -5 hours for digestion and absorption.

2. Why is wall of stomach highly muscular?

Walls of the stomach is highly muscular so that it can churn the food thoroughly along with the digestive juices and can change it into a pulp like thick paste called chime.

3. Name the enzymes contained in the intestinal juice.

Intestinal juice contains enzymes like erepsin, maltase, sucrose and lactase.

4. Name the enzymes contained in the pancreatic juice.

Pancreatic juice contains enzymes like amylase, trypsin and lipase.

5. Explain the function of gastric juice in digestion.

The functions of gastric juice in digestion are

i) It kills the germs and prevent the rotting of food during its long stay in the stomach.

ii) It activates the enzyme pepsin, which converts proteins into simpler compound called peptones.

6. Define the following:

a) Emulsification b) Caries c) Villi d) Rectum e) Duodenum
f) Jejunum g) ileum

a) Emulsification: The bile juices breaks down fats into tiny droplets. This process is called emulsification.

b) Caries: The acid produced by the bacteria slowly corrodes the teeth and forms cavities, which are known as caries.

c) Villi: The inner lining of the small intestine contains a large number of tiny finger like projections called villi. The surface of the villi absorbs the amino acids and glucose to pass them into the blood system.

d) Rectum: The rectum is the last part of the large intestine and is about 15 cm long. It stores the undigested waste matter called faeces. It opens to the outside at the anus.

e) Duodenum: This is the upper 'U' shaped part of the small intestine. It receives a common duct that receives both bile juice from the liver and the pancreatic juice from the pancreas.

f) Jejunum: The second part of the small intestine is called jejunum. No digestion takes place here.

g) Ileum: Ileum is the last part of the small intestine. It is a long narrow coiled tube. It produces the intestinal juice and serves function both for the digestion and absorption of the digested food.

7. Define the term nutrient.

Nutrient can be defined as a constituent of food that helps one way or the other in the body's function.

8. Differentiate between Macronutrients and Micronutrients.

Macronutrients	Micronutrients
These required in larger quantities.	These are required in minute quantities.
Example: Nutrients like Carbohydrates, fats and proteins.	Example: Nutrients like Minerals and vitamins

9. What is the alimentary canal consists of?

The elementary canal consists of mouth, oesophagus, stomach, small intestine, large intestine and rectum.

10. What are the different digestive glands?

The different digestive glands are salivary glands, liver and pancreas.

C. Long Questions And Answers.

Answer the following:

1. Classify the nutrients according to their groups and define their functions.

Nutrients are classified into five major groups:

Carbohydrates: These provide energy to our body.

Proteins: These helps in the growth of our body.

Fats: These provide energy to our body as well as help in insulating the body.

Minerals: These are need for specific roles in the body.

Vitamins: These helps in normal functioning of various body processes.

2. How the tongue is helpful to us?

The tongue helps us in many ways.

i) It manipulates the food while chewing.

ii) It helps in tasting the food.

iii) It helps in mixing the saliva with the food.

iv) It helps in cleaning the tooth when food particles are stuck into it.

v) It helps in speaking.

3. Name the different enzymes contained in the pancreatic juice and state their functions.

The pancreatic juice contains enzymes like amylase, trypsin and lipase.

Amylase: This acts on the starch and converts it into maltose.

Trypsin: It converts proteins and peptones into peptides.

Lipase: It converts emulsified fats into fatty acids and glycerol.

4. Show the equations of conversion of starch, proteins and peptones, emulsified fats, peptides, maltose, sucrose and lactose to their respective forms while reacting with different enzymes.

Starch $\xrightarrow[\text{Amylase}]{\text{Pancreatic}}$ Maltose

Proteins + Peptones $\xrightarrow{\text{Trypsin}}$ Peptides

Emulsified fat $\xrightarrow{\text{Lipase}}$ Fatty acids and glycerol

Peptides $\xrightarrow{\text{Erepsin}}$ Amino acids

Maltose $\xrightarrow{\text{Maltase}}$ Glucose

Sucrose $\xrightarrow{\text{Sucrase}}$ Glucose and fructose

Lactose $\xrightarrow{\text{Lactase}}$ Glucose and galactose

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