Digestive System:

A digestive system is a group of organs which work to convert the food into basic nutrients for feeding energy to the whole body. Human does not produce its own food like plants and depend on other plants and animals for food, hence called **Heterotroph**. Human needs various nutrients, proteins and vitamins which are derived from food through digestion. Chewing, in which food is mixed with saliva begins the process of digestion. This produces a bolus which can be swallowed down the oesophagus and into the stomach. The complete process of nutrition is divided into five stages:

- **Ingestion**
- **Digestion**
- **Absorption**
- **Assimilation**
- **Defecation**

Ingestion:

The process of **taking food, drink or any other substance** into the body by swallowing and absorbing it, is known as Ingestion.

Digestion:

- The digestive system contains six components which are as follow-

1. Mouth
2. Oesophagus

- Stomach

1. The small intestine
2. Colon (large intestine)
3. Rectum

- Digestion is a process through the large insoluble and non-absorbable food particles are broken down into smaller water-soluble and absorbable particle which are finally absorbed by blood plasma.
- It is a form of catabolism which is divided into two groups based on how food is broken down in the body, if food is broken down through mechanical means then it is known as Mechanical Digestion and if it is through chemical means then it is called as Chemical Digestion.

Mouth and Oesophagus

- Digestion initiates right from the mouth, where Salivary gland secrets the **Saliva** in the mouth in which two types of enzymes are found, **ptyalin and maltase.**
- saliva contains an enzyme called salivary amylase that begins the process of converting starches in the food into maltose
- Around **1.5 litres** of saliva is secreted in human on an average day, it is acidic in nature (pH 6.8)
- Through food pipe or Oesophagus, food reaches into the stomach.

Digestion in Stomach:

- The ph of the stomach is 1.5-2.5. This acidic environment helps in breaking the food particle and absorption of necessary nutrients from food.
- The highly acidic environment of the stomach contains gastric glands which secrete gastric juice, this is a light yellow acidic acid.
- **Pepsin and Renin** are the enzymes in the gastric juice.
- Parietal cells secrete Chlorine and Hydrogen ion which combine to form Hydrochloric acid which helps in killing microorganisms and with the help of enzyme pepsin helps in the hydrolysis of proteins.
- Hydrochloric acid makes the food acidic by which **ptyalin** reaction of the saliva end.
- Pepsin breaks down the protein into **peptones and** Renin breaks down the Caseinogen into Casein.

Digestion in Duodenum:

- The duodenum is the first and shortest segment of the small intestine. It receives partially digested food (known as chyme) from the stomach and plays a vital role in the chemical digestion of chyme in preparation for absorption in the small intestine.
- The gall bladder releases bile, which has been produced by the liver, to help further break fats down into a form that can be absorbed by the intestines.
- As the food reaches the duodenum bile juice from the liver combines with it. The main function of the bile juice is **to convert the acidic food into alkaline**, as it is alkaline in nature.
- Pancreatic juice from pancreas combines with food and it contains the following enzymes:

1. **Trypsin:** It converts the **protein and peptone** into polypeptides and amino acid.
2. **Amylase:** It converts the **starch** into soluble sugar.
3. **Lipase:** It converts the emulsified **fats** into glycerol and fatty acids.

Digestion in Small Intestine:

- Here the process of digestion completed and **absorption** of digested foods start.
- In the small intestine, intestinal juices secrete and it is alkaline in nature and around **2 litres** of intestinal juice secretes per day.
- Intestinal juice contains the following enzymes:

1. **Erepsin:** It converts the remaining protein and peptone into amino acids.
2. **Maltase:** It converts the maltose into glucose.
3. **Sucrase**: It converts the sucrose into glucose and fructose.
4. **Lactase:** It converts the lactose into glucose and galactose.
5. **Lipase:** It converts the emulsified fats into glycerol and fatty acids.

Absorption:

- Digested food is absorbed by blood plasma is known as Absorption.
- The absorption of digested foods takes place through **small intestine villi** which are finger-like structure extended into the lumen of the small intestine.

Assimilation:

- Use of absorbed food in the body or movement of digested particles where they are used is called assimilation

Defecation:

- It is the final act of digestion. It is also known as a bowel movement. Undigested food reaches from small to the large intestine where bacterias convert it into faeces which is excreted through the anus.

Disorders of digestive system:

Here are some important digestive disorder in human beings.

Disorder	Symptoms
Vomiting	Expulsion of food from the mouth due to irritation in the stomach.
Diarrhoea	Infectious disease resulting in a loose frequent bowel.
Jaundice	Yellow colouration of the skin and mucous membrane.
Gall stone	Cholesterol crystallises to form gall stone.
Constipation	the difficulty of defecation due to decreased mobility in the large intestine.