DIGESTION AND ABSORPTION IN MAN

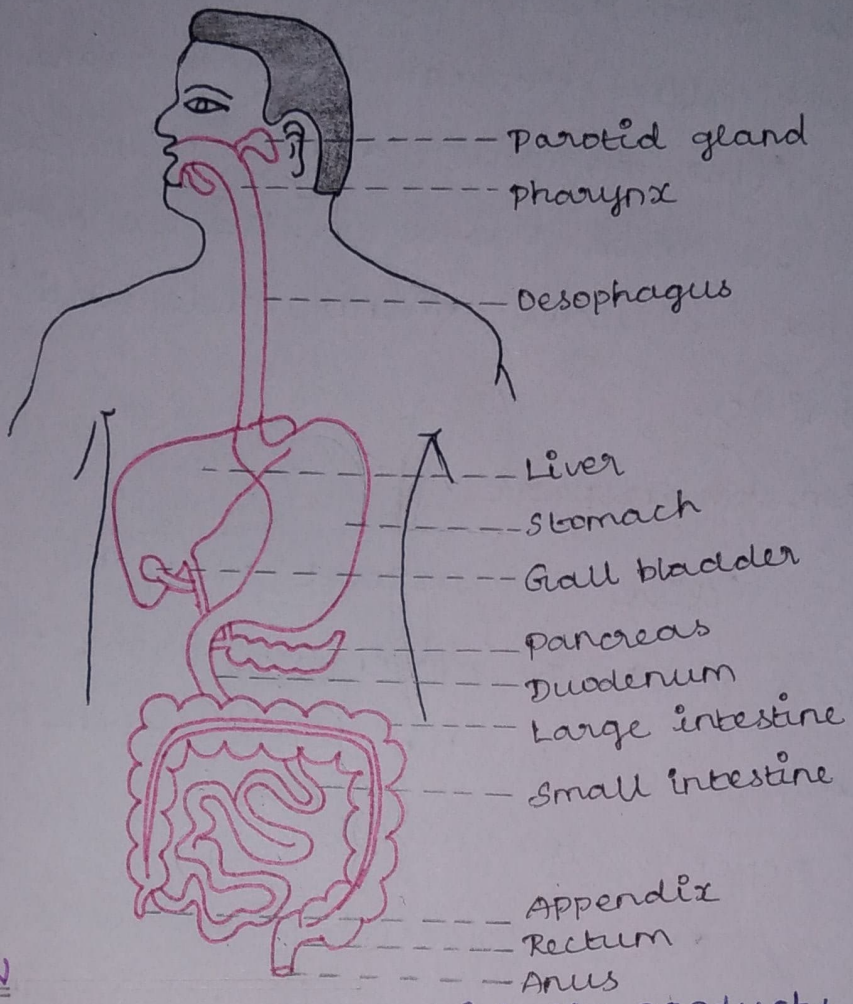
DIGESTION IN MAN

The human digestive system consists of the **gastrointestinal tract** plus the accessory organs of digestion (the tongue, salivary glands, Pancreas, liver and gallbladder). **Digestion** involves the breakdown of food into smaller and smaller components, until they can be absorbed and assimilated into the body. The process of digestion has three stages. The first stage is the cephalic phase of digestion which begins with gastric secretions in response to the sight and smell of food. This stage includes the mechanical breakdown of food by chewing, and the chemical breakdown by digestive enzymes, that takes place in the mouth.

Saliva contains digestive enzymes called **amylase** and **lingual lipase** secreted by the **salivary glands** and **serous glands** on the tongue. The enzymes start to break down the food in the mouth. Chewing, in which the food is mixed with saliva, begins the mechanical process of digestion. This produces a bolus which can be swallowed down

the esophagus to enter the stomach. In the stomach the gastric phase of digestion takes place. The food is further broken down by mixing with gastric acid until it passes into the duodenum, in the third intestinal phase of digestion, where it is mixed with a number of enzymes produced by the pancreas. Digestion is helped by the chewing of food carried out by the muscles of mastication, the tongue and the teeth, and also by the contractions of peristalsis and segmentation. Gastric acid, and the production of mucus in the stomach, are essential for the continuation of digestion.

Peristalsis is the rhythmic contraction of muscles that begins in the esophagus and continues along the wall of the stomach and the rest of the gastrointestinal tract. This initially results in the production of chyme which when fully broken down in the small intestine is absorbed as chyle into the lymphatic system. Most of the digestion of food takes place in the small intestine. Water and some minerals are reabsorbed back into the blood in the colon of the large intestine. The waste products of digestion (feces) are defecated from the anus via the rectum.



ABSORPTION IN MAN

Absorption is the process by which the products of digestion are absorbed by the blood to be supplied to the rest of the body.

During absorption, the digested products are transported into the blood and lymph through the mucous membrane. Absorption is achieved by the following mechanisms.

* Simple diffusion.
* Active transport
* Facilitated transport
* Passive transport

Simple diffusion

Simple diffusion is defined as the movement of solute from the higher concentration to the lower concentration through the membrane.

After digestion, a few monosaccharides diffuse into the blood based on the concentration gradient.

Example : Glucose, amino acids and ions like Chloride.

Active transport

Active transport may be defined as the process of solute movement from the lower concentration to the higher concentration by the expense of energy.

Electrolytes like Na ions are absorbed by active transport into the blood.

Facilitated transport

Facilitated transport is defined as the process of movement of solutes across a cell membrane without a requirement of energy. After digestion, simpler food substance is absorbed into the blood by passive transport.