

Name of the student: *Date:*/...../.....

❖ Digestive gland:

The glands, whose secretion takes part in the digestion of foods, are called digestive glands. The digestive glands in human are—

(a) Salivary glands:

Three pairs of salivary glands are—

- 1) Parotid gland: Located in front of and below each ear
- 2) Submandibular gland: Located beneath the lower jaws
- 3) Sublingual gland: Located below the tongue

Secretion from the salivary glands is known as saliva. Saliva contains the enzyme salivary amylase, also called ptyalin which acts on starch. Saliva also contain mucin which makes the food slippery.

Q. How do salivary glands help in digestion?

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(b) Liver:

The **liver** is an organ only found in vertebrates which detoxifies various metabolites, synthesizes proteins and produces bio-chemicals, necessary for digestion and growth.

Structure of liver:

- 1) The liver is a triangular, bi-lobed structure consisting of a larger right lobe and a smaller left lobe. The falciform ligament separates the two lobes.

- 2) Basically liver consists of four incomplete lobes. Each lobe consists of lobules. Each lobule contains numerous cells. These cells produce bile. Bile is alkaline in nature.
- 3) A layer of fibrous tissue called Glisson's capsule covers the liver. This capsule is covered by peritoneum. This protects the liver from physical damage.
- 4) Liver is composed of four major types of cell—1) hepatocytes (HCs), 2) hepatic stellate cells (HSCs), 3) Kupffer cells (KCs) and 4) liver sinusoidal endothelial cells (LSECs)

Liver has two main sources of blood:

- **Hepatic Portal Vein** that carries nutrient-rich blood from the digestive system to the liver.
- **Hepatic Artery** that carries oxygenated blood from the heart to the liver.

Functions of Liver

The important functions of the liver are mentioned below:

1) Production of Bile

Bile, which helps in the digestion and absorption of fats, vitamins and cholesterol is produced in the liver. Bile is alkaline in nature. Bile neutralizes the acidic chyme and creates alkaline medium. This is favorable for digestion.

2) Absorption of Bilirubin

Bilirubin is formed by the breakdown of haemoglobin. The released iron is stored in the liver to make next-generation blood cells.

3) Supporting Blood Clots

Bile is responsible for the absorption of vitamin K. If bile is not produced, clotting factors will not be produced.

4) Metabolization of Fats

Bile helps in the breakdown and digestion of fats.

5) Carbohydrate Metabolization

The carbohydrates stored in the liver as glycogen are broken down into glucose and released into the blood to maintain glucose levels.

6) Storage of Vitamins and Minerals

Vitamins A, D, E, K, and B12 are stored in the liver. It also stores iron in the form of ferritin to form new red blood cells.

7) Metabolization of Proteins

Bile helps in the digestion of proteins.

8) Filtering Blood

The compounds such as hormones, alcohol, etc. are filtered by the liver from the blood.

(c) Pancreas:

Pancreas is an abdominal organ located behind the stomach and surrounded by spleen, liver and small intestine which acts as an important mixed gland.

The pancreas has both endocrine and exocrine functions.

As an exocrine gland pancreas secretes pancreatic juice. Pancreatic juice contains amylase, lipase, trypsin named enzymes. These enzymes help in carbohydrate, protein and fats digestion. It maintains acid-base balance, water balance and controls body temperature.

As an endocrine gland pancreas secretes insulin, glucagon, somatostatin, and pancreatic polypeptide. The endocrine part of the pancreas consists of Islets of Langerhans. Beta cells of Islets of Langerhans secrete insulin which acts to lower blood sugar. Alpha cells of Islets of Langerhans secrete glucagon which acts to raise blood sugar.

Q. Why is pancreas called mixed gland?

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