

**Question 1:**

Choose the correct answer among the following:

- (a) Gastric juice contains
- (i) pepsin, lipase and rennin
  - (ii) trypsin lipase and rennin
  - (iii) trypsin, pepsin and lipase
  - (iv) trypsin, pepsin and renin
- (b) Succus entericus is the name given to
- (i) a junction between ileum and large intestine
  - (ii) intestinal juice
  - (iii) swelling in the gut
  - (iv) appendix

Answer

**Answer (a): (i)** Pepsin, lipase, and rennin

Gastric juice contains pepsin, lipase, and rennin. Pepsin is secreted in an inactive form as pepsinogen, which is activated by HCl. Pepsin digests proteins into peptones. Lipase breaks down fats into fatty acids. Rennin is a photolytic enzyme present in the gastric juice. It helps in the coagulation of milk.

**Answer (b): (ii)** Intestinal juice

Succus entericus is another name for intestinal juice. It is secreted by the intestinal gland. Intestinal juice contains a variety of enzymes such as maltase, lipases, nucleosidases, dipeptidases, etc.

**Question 2:**

Match column **I** with column **II**

Column I		Column II	
(a)	Bilirubin and biliverdin	(i)	Parotid
(b)	Hydrolysis of starch	(ii)	Bile

(c)	Digestion of fat	(iii)	Lipases
(d)	Salivary gland	(iv)	Amylases

Answer

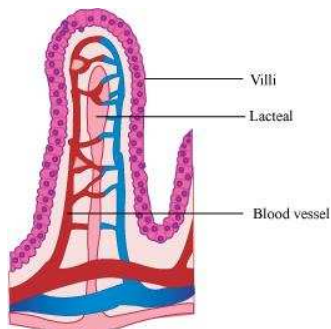
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(a)	Bilirubin and biliverdin	(ii)	Bile
(b)	Hydrolysis of starch	(iv)	Amylases
(c)	Digestion of fat	(iii)	Lipases
(d)	Salivary gland	(i)	Parotid

### Question 3:

Answer briefly:

- Why are villi present in the intestine and not in the stomach?
- How does pepsinogen change into its active form?
- What are the basic layers of the wall of alimentary canal?
- How does bile help in the digestion of fats?

Answer



**(a)** The mucosal wall of the small intestine forms millions of tiny finger-like projections known as villi. These villi increase the surface area for more efficient food absorption.

Within these villi, there are numerous blood vessels that absorb the digested products of proteins and carbohydrates, carrying them to the blood stream. The villi also contain lymph vessels for absorbing the products of fat-digestion. From the blood stream, the absorbed food is finally delivered to each and every cell of the body.

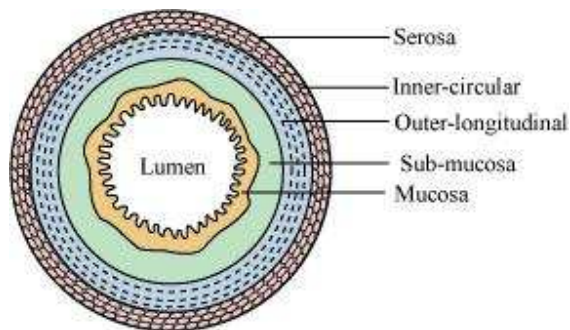
The mucosal walls of the stomach form irregular folds known as rugae. These help increase the surface area to volume ratio of the expanding stomach.

**(b)** Pepsinogen is a precursor of pepsin stored in the stomach walls. It is converted into pepsin by hydrochloric acid. Pepsin is the activated in the form of pepsinogen.

Pepsinogen  $\xrightarrow{\text{HCl}}$  Pepsin + Inactive peptide

(Inactive) (Active)

**(c)** The walls of the alimentary canal are made up of four layers. These are as follows:



(i) **Serosa** is the outermost layer of the human alimentary canal. It is made up of a thin layer of secretory epithelial cells, with some connective tissues underneath.

(ii) **Muscularis** is a thin layer of smooth muscles arranged into an outer longitudinal layer and an inner circular layer.

(iii) **Sub-mucosa** is a layer of loose connective tissues, containing nerves, blood, and lymph vessels. It supports the mucosa.

- iv. **Mucosa** is the innermost lining of the lumen of the alimentary canal. It is mainly involved in absorption and secretion.

**(d)** Bile is a digestive juice secreted by the liver and stored in the gall bladder. Bile juice has bile salts such as bilirubin and biliverdin. These break down large fat globules into smaller globules so that the pancreatic enzymes can easily act on them. This process is known as emulsification of fats. Bile juice also makes the medium alkaline and activates lipase.

#### Question 4:

State the role of pancreatic juice in digestion of proteins.

Answer

Pancreatic juice contains a variety of inactive enzymes such as trypsinogen, chymotrypsinogen, and carboxypeptidases. These enzymes play an important role in the digestion of proteins.

#### *Physiology of protein-digestion*

The enzyme enterokinase is secreted by the intestinal mucosa. It activates trypsinogen into trypsin.

Trypsinogen  $\xrightarrow{\text{Enterokinase}}$  Trypsin + Inactive peptide

Trypsin then activates the other enzymes of pancreatic juice such as chymotrypsinogen and carboxypeptidase.

Chymotrypsinogen is a milk-coagulating enzyme that converts proteins into peptides.

Chymotrypsinogen  $\xrightarrow{\text{Trypsin}}$  Chymotrypsin  
(Inactive) (Active)

Proteins  $\xrightarrow{\text{Chymotrypsin}}$  Peptides

Carboxypeptidase acts on the carboxyl end of the peptide chain and helps release the last amino acids. Hence, it helps in the digestion of proteins.

Peptides  $\xrightarrow{\text{Carboxypeptidase}}$  Smaller peptide chain + Amino acids

















