Chapter 14: Human Nutrition

EXERCISE [PAGE 172]

Exercise | Q 1. (A) | Page 172
Choose the correct option.
Acinar cells are present in _____.

1. liver
2. **pancreas**
3. gastric glands
4. intestinal glands

SOLUTION

Acinar cells are present in **pancreas.**

Exercise | Q 1. (B) | Page 172
Choose the correct option.
Which type of teeth are maximum in number in human buccal cavity?

1. Incisors
2. Canines
3. Premolars
4. **Molars**

SOLUTION

Molars

Exercise | Q 1. (C) | Page 172
Choose the correct option.
Select odd one out on the basis of digestive functions of tongue.

1. Taste
2. Swallowing
3. **Talking**
4. Mixing of saliva in food

SOLUTION

Taste, Swallowing, Talking, Mixing of saliva in food- **Talking.**

Exercise | Q 1. (D) | Page 172
Choose the correct option.
Complete the analogy:
Ptyalin: Amylase: Pepsin: _____

1. Lipase
2. Galactose
3. Proenzyme
4. **Protease**

SOLUTION

Ptyalin: Amylase: Pepsin: **Protease.**

Exercise | Q 2. (A) | Page 172

Answer the following question.

For the school athletic meet, Shriya was advised to consume either Glucon-D or fruit juice but no sugarcane juice. Why it must be so?

SOLUTION

Sugarcane juice contain disaccharides. Disaccharides take time to digest i.e. breaking into monosaccharides, Glucon – D and fruit juices contain monosaccharide. Therefore, for instant supply of energy during athletic meet Glucon – D or fruit juices are preferred and not sugarcane.

Exercise | Q 2. (B) | Page 172

Answer the following question.

Alcoholic people may suffer from liver disorder. Do you agree? Explain your answer.

SOLUTION

1. Liver disorder in alcoholic people may occur after years of heavy drinking.
2. Most of the alcohol in the body is broken down in the liver by an enzyme called alcohol dehydrogenase, which transforms ethanol into a toxic compound called acetaldehyde (CH_3CHO).
3. Over consumption of alcohol leads to cirrhosis (distorted or scarred liver) and eventually to liver failure. Therefore, alcoholic people may suffer from liver disorder.

Exercise | Q 2. (C) | Page 172

Answer the following question.

Digestive action of pepsin comes to a stop when food reaches small intestine. Justify.

SOLUTION

Pepsin acts in acidic medium thus it is active in stomach. There is alkaline condition in the small intestine. pH of small intestine is very high for pepsin to work. Therefore, pepsin gets denatured in the small intestine.

Exercise | Q 2. (D) | Page 172

Answer the following question.

Small Intestine is very long and coiled. Even if we jump and run, why it does not get twisted? What can happen if it gets twisted?

SOLUTION

1. Mesentery is a tissue that is located in the abdomen. It attaches the small intestine to the wall of the abdomen and keeps it in place and therefore it does not get twisted while running and jumping.

2. If small intestine gets twisted, the affected spot may block the food, liquid passing through it. It may sometimes cut off the blood flow if the twist is very severe. If this happens the surrounding tissue may die and can cause serious problems.

Exercise | Q 3. (A) | Page 172

Write down the explanation.
Digestive enzymes are secreted at appropriate time in our body. How does it happen?

SOLUTION

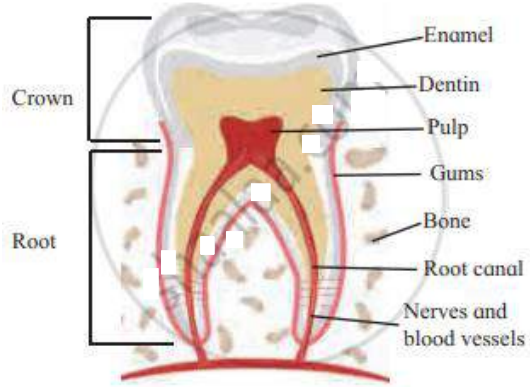
1. The digestive enzymes and juices are produced in sequential manner and at a proper time.
2. These secretions are under neurohormonal control.
3. Sight, smell and even thought of food trigger saliva secretion.
4. Tenth cranial nerve stimulates secretion of gastric juice in stomach.
5. Even the hormone gastrin brings about the same effect.

Exercise | Q 3. (B) | Page 172

Write down the explanation.
Explain the structure of tooth.

SOLUTION

Structure of tooth:



Tooth Anatomy

1. A tooth consists of the portion that projects above the gum called crown and the root that is made up of two or three projections which are embedded in gum.
2. A short neck connects the crown with the root.
3. The crown is covered by the hardest substance of the body called enamel which is made up of calcium phosphate and calcium carbonate.
4. Basic shape of tooth is derived from dentin which is a calcified connective tissue.
5. The dentin encloses the pulp cavity. It is filled with connective tissue pulp. It contains blood vessels and nerves.
6. Pulp cavity has extension in the root of the tooth called root canal.

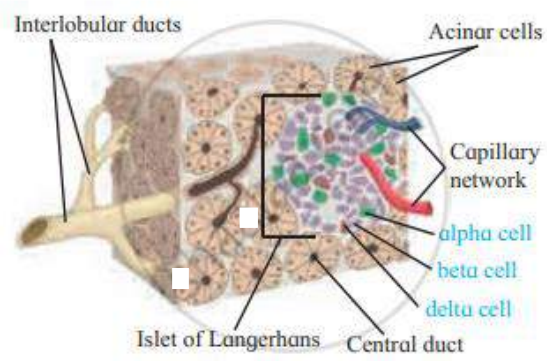
7. The dentin of the root of tooth is covered by cementum which is a bone like substance that attaches the root to the surrounding socket in the gum.

Exercise | Q 3. (C) | Page 172

Write down the explanation.
Explain heterocrine nature of pancreas with the help of histological structure.

SOLUTION

1. Pancreas is a leaf shaped heterocrine gland present in the gap formed by bend of duodenum under the stomach.
2. Exocrine part of pancreas is made up of acini, the acinar cells secrete alkaline pancreatic juice that contains various digestive enzymes.
3. Pancreatic juice is collected and carried to duodenum by pancreatic duct.
4. The common bile duct joins pancreatic duct to form hepato-pancreatic duct. It opens into duodenum.
5. Opening of hepato-pancreatic duct is guarded by sphincter of Oddi.
6. Endocrine part of pancreas is made up of islets of Langerhans situated between the acini.
7. It contains three types of cells α-cells which secrete glucagon, β-cells which secretes insulin and δ cells secrete somatostatin hormone.
8. Glucagon and insulin together control the blood-sugar level.
9. Somatostatin hormone inhibits glucagon and insulin secretion.



Exercise | Q 4. (A) | Page 172

Write a short note on the position and function of salivary gland.

SOLUTION

1. There are three pairs of salivary glands which open in buccal cavity.
2. Parotid glands are present in front of the ear.
3. The submandibular glands are present below the lower jaw.
4. The glands present below the tongue are called sublingual.
5. Salivary glands are made up of two types of cells.
6. Serous cells secrete a fluid containing digestive enzyme called salivary amylase.

7. Mucous cells produce mucus that lubricates food and helps swallowing.

Exercise | Q 4. (B) | Page 172

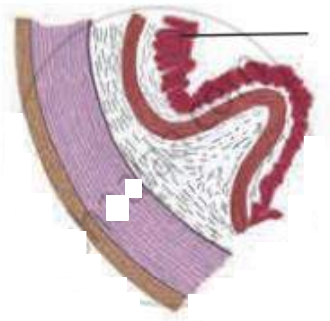
Write short note on Jaundice.

SOLUTION

1. Jaundice is a disorder characterized by yellowness of conjunctiva of eyes and skin and whitish stool.
2. It is a sign of abnormal bilirubin metabolism and excretion.
3. Jaundice develops if excessive break down of red blood cells takes place along with increased bilirubin level than the liver can handle or there is obstruction in the flow of bile from liver to duodenum.
4. Bilirubin produced from breakdown of haemoglobin is either water soluble or fat soluble.
5. Fat soluble bilirubin is toxic to brain cells.
6. There is no specific treatment to jaundice.
7. Supportive care, proper rest are the treatments given to the patient.

Exercise | Q 5 | Page 172

Observe the diagram. This is the histological structure of the stomach. Identify and comment on the significance of the layer marked by an arrow.

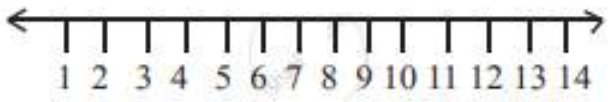


SOLUTION

The layer marked in the diagram represents glandular epithelium of mucosa.
Significance of the glandular epithelium of mucosa:
Goblet cells of the epithelial layer of a mucous membrane secrete mucus which lubricates the lumen of the alimentary canal. This helps in movement of food through the gastrointestinal tract.

Exercise | Q 6 | Page 172

Find out pH maxima for salivary amylase, trypsin, nucleotidase and pepsin and place on the given pH scale.



SOLUTION

Salivary amylase = 6.8
Trypsin = 8
Nucleotidase = 7.5
Pepsin = 2

Exercise | Q 7 | Page 172

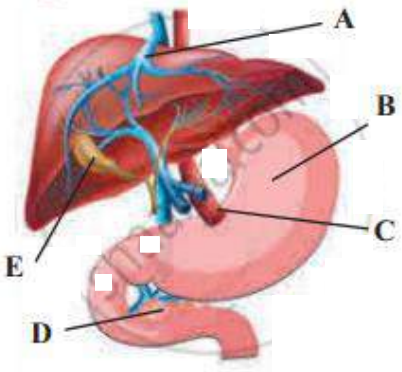
Write the name of a protein deficiency disorder and write symptoms of it.

SOLUTION

1. Kwashiorkor is a protein deficiency disorder.
2. This protein deficiency disorder is found generally in children between one to three years of age.
3. Children suffering from Kwashiorkor are underweight and show stunted growth, poor brain development, loss of appetite, anaemia, protruding belly, slender legs, bulging eye, oedema of lower legs and face, change in skin and hair colour.

Exercise | Q 8 | Page 172

Observe the diagram given below label the A, B, C, D, E and write the function of A, C in detail.



SOLUTION

A. Bile duct,
B. Stomach,
C. Common hepatic duct,
D. Pancreas,

E. Gall Bladder

Functions of A- Bile duct and C- Common hepatic duct:

- **Bile duct:**
  It carries bile from the gall bladder and empties it into the upper part of the small intestine.
- **Common hepatic duct:**
  It drains bile from the liver. It helps in transportation of waste from liver and helps in digestion by releasing bile.