

Short Answer Type Questions-I

Q.1. Bile does not contain any digestive enzymes, yet it is essential for digestion. Why? [KVS Agra 2016]

Ans. Importance of bile in digestion:

- (i) Bile neutralizes acidic medium.
- (ii) Bile emulsifies fat.
- (iii) Bile activates lipase.

Q.2. Salivary amylase and pancreatic amylase both work on starch but still are different to each other. Write two differences between them? [KVS Agra 2016]

Ans. Differentiation between salivary amylase and pancreatic amylase:

S.No	Salivary amylase	Pancreatic amylase
(i)	Salivary amylase is produced in the Salivary glands.	Pancreatic amylase is produced in the pancreas.
(ii)	Salivary amylase starts digestion of carbohydrates of carbohydrates in the mouth.	Pancreatic amylase acts on the remaining polysaccharides in the small intestine.

Q.3 What are the functions of the large intestine?

Ans. (i) The chief functions of the large intestine are the absorption of water and the elimination of solid wastes.

(ii) Moderate quantities of vitamin K and vitamin B complex are manufactured by bacteria in the large intestine.

Q.4. Mention the function of stomach.

Ans. (i) it churns and break up food and mixes the pieces with gastric juice.

(ii) Partial digestion of food takes place here.

(iii) It produces Castle's intrinsic factor (a glycoprotein) which is necessary for the absorption of vitamin B₁₂ to be absorbed in the intestine.

(iv) It also secretes gastrin hormone.

Q.5. How many types of teeth are there? Give their characteristics.

Ans. There are four kinds of teeth : Incisors, canines, premolars and molars.

(i). Incisors are chisel-shaped and possess sharp cutting edges and are located anteriorly. They are usually specialized for cutting.

(ii) Canines immediately lie behind incisors and are used for cutting of food.

(iii) Premolars and molars are called cheek teeth, which are broad, strong crushing teeth.

(iv) Last molars in human beings are called wisdom teeth which is vestigial.

Q.6. What are the properties of saliva?

Ans. (i) The fluids secreted by major and minor salivary glands constitute saliva.

(ii) Saliva is slightly acidic and its pH is 6.8

(iii) Saliva is a mixture of water and electrolytes (Na^+ , K^+ , Cl^- , HCO_3^-) derived from blood plasma, mucous, serous fluids and salivary amylase or ptyalin enzyme and lysozyme (anti-bacterial agent), secreted by salivary glands.

(iv) Ions of thiocyanate are also present in saliva.

Q.7. How is peristalsis produced?

Ans. (i) Peristalsis is produced by involuntary contraction of circular muscles in the oesophagus lying above the bolus and simultaneous contraction of the longitudinal muscles lying below the bolus.

(ii) Contraction of the longitudinal muscles shortens the lower part of the oesophagus, pushing its walls outward so that it can receive the bolus.

(iii) After this, circular muscles of the oesophagus relax.

(iv) The contractions are repeated in a wave that moves down the oesophagus, pushing the food towards the stomach.

Q. 8. Why are carbohydrates more suitable for the production of energy?

Ans. Carbohydrates are more suitable for the production of energy in the body than proteins and fats because carbohydrate molecules contain relatively more oxygen than the others, hence require less molecular oxygen for oxidation. Carbohydrates are also stored in the body cells as glycogen and are used for the production of energy whenever required.

Q.9. Some people can eat things even when standing on their heads. Why does not the food fall back into the mouth?

Ans. There is a movement in the walls of oesophagus called peristaltic movement, which allows the food particles to move forwards *i.e.*, towards stomach and not back. Thus food does not come back into mouth even at the time of standing on the head.

Q.10. If the pancreatic ducts of a person were blocked how would it affect the digestion of fats in the duodenum?

Ans. Pancreatic duct in addition to bringing pancreatic juice brings bile juice also.

(i) The pancreatic juice contains pancreatic lipase which is the principal enzyme for the digestion of fat.

(ii) The bile juice helps in the emulsification of fats. In the absence of these, the digestion of fats is seriously affected.

Q.11. What digestive disorders do you expect in a habitual alcoholic?

Ans. Alcoholic is a person who consumes lots of alcohol regularly. Alcohol is directly absorbed from the stomach by the blood capillaries. The alcohol is known to cause damage to the liver cells. Liver cells produce bile juice. If the liver cells are damaged, they would not be able to produce bile. If the bile is not produced in required quantities, the emulsification and further digestion of fats is not possible. This would bring about disturbances in the digestion and adsorption of fats. The alcohol also hardens the stomach wall, which would reduce the churning of food in the stomach.

Q.12. What are microvilli? State their functions.

Ans. (i) Microvilli are finger like projections of the mucosa of intestine.

(ii) They increase the surface area of digestion and absorption.

Q.13. how are all stones formed? What is cholecystectomy?

Ans. Gall stones are formed in the gall bladder as a result of the precipitation of cholesterol or other substances. Some gall stones contain large amounts of calcium. Inflammation of gall bladder is called cholecystectomy.

Q.14. What is emulsification and why is it required?

Ans. Fat is largely digested in the small intestine. Bile salts of the bile break down fat droplets into many small ones by reducing the surface tension of fat droplets. This process is called emulsification. This increases lipases on fat.

Q.15. What do you understand assimilation?

Ans. The absorbed nutrients finally reach the tissues which utilize them for their activities. This process is called assimilation.

Q.16. What is the action of salivary amylase?

Ans. (i) Salivary amylase or ptyalin hydrolyses starch into maltose isomaltose and α -dextrins.

Starch $\xrightarrow[\text{Amylase}]{\text{Salivary}}$ maltose + Isomaltose + α – dextrins

(ii) Bicarbonate ions in saliva neutralise the acids in food. The lysozyme present in saliva act as anti-microbial agent and prevent infection by the microbes.

Q.17. What are the main functions of bile ?

Ans. Bile serves the following functions:

(i) Sodium bicarbonate present in bile neutralizes HCl of chyme.

(ii) Sodium glycocholate and sodium taurocholate break the large fat droplets into the smaller ones.

(iii) Its salts help in the absorption of fat and fat-soluble vitamins.

(iv) Bile pigments are excretory products.

Q.18. Which digestive fluids are added to the food in the duodenum ? What is their action?

Ans. In the duodenum pancreatic juice and bile juice are discharged by the pancreas and liver respectively. The pancreatic juice is secreted by pancreas and is brought to the duodenum through pancreatic duct. The pancreatic juice contains three enzymes: i.e., Trypsin, Amylase and Lipase.

Q.19. Write the difference between sucrase and maltase.

S. No.	Sucrase	Maltase
(i)	Sucrase hydrolyses sucrose into glucose and fructose (monosaccharides)	Maltase hydrolyses maltose into glucose (monosaccharides)

Q. 20. Write the difference between lipase and peptidase.

Ans. Lipase completes the digestion of fats to fatty acids and glycerol. Peptidases completes the digestion of protein by converting peptides and polypeptides to amino acids.

Q.21. Name any two proteases in the pancreatic juice. What are their specific roles

Ans. Chymotrypsin and trypsin are the two proteases in the pancreatic juice. They enable simultaneous stimulation of all pancreatic proteases for a very rapid digestion of proteins.

Q.22. What is the function of the muscular wall of the stomach, other than secreting gastric juice ?

Ans. The muscular movement of stomach wall churns and mixes the food with gastric juice and propels it to the small intestine through the pyloric valve.

Q.23. Hydrochloric acid (HCl) and proteolytic enzymes produced by stomach do not digest its own wall, why?

Ans. Hydrochloric acid (HCl) does not act on the wall on the stomach because the wall is covered by mucous, which forms a barrier. The proteolytic enzymes also do not reach the wall because of this factor.

Q. 24. Write a brief note on physical and mechanical digestion.

Ans. In physical and mechanical digestion, the food is broken down to smaller pieces. Mastication occurs in the mouth and the buccal cavity. Deglutition is common process in the pharynx and the oesophagus. Peristalsis occurs in oesophagus, stomach and colon. Swallowing is done in pharynx and movement of food mass is seen in every part of the alimentary canal. Churning movement is produced in stomach, as well as in intestine.