I PUC – Biology
Chapter - 16
Digestion and Absorption

One Mark Questions.

1. Name the major components of our food.
   Ans: The major components of our food are carbohydrates proteins and fats.

2. Why do we need food?
   Ans: Food provides energy and organic materials for growth and repair of tissues.

3. What is the role played by water in our body ?
   Ans: We should take in water as it is essential for metabolism and also prevents the body from dehydration.

4. Define the term Digestion.
   Ans: The process of conversion of complex food substances to simple absorbable forms is called digestion.

5. Name the 2 methods by which digestion takes place.
   Ans: The two steps involved in digestion are
   a) Mechanical method b) Biochemical method

6. Name the 2 major components of the Human digestive system.
   Ans: The human digestive system consists of the alimentary canal and the associated glands.

7. What is meant by thecodont condition.
   Ans: Tooth embedded in the socket of the jaw bone is called as thecodont.

8. Why do we say that the teeth in Human's is diphydont?
   Ans: Human beings form 2 sets of teeth during their life is, a set of milk teeth or deciduous teeth replaced by a set of permanent teeth, hence called as diphydont.

9. What is meant by Heterodont condition?
   Ans: An adult human has 32 permanent teeth which are of 4 different types viz, incisors, canine, premolars and molars thus called Heterodont.

10. Give the dental formula in Man.
    Ans: $\frac{2123}{2123}$

11. What is the hard chewing surface of teeth called as? What is its function?
    Ans: The hard chewing surface of the teeth is the enamel. It helps in mastication of food.
12. Name the cartilaginous flap present in the pharynx.
    Ans: Epiglottis.

13. Name the different parts of the stomach. (Anatomical regions)

Ans: Fundus, cardiac, pyloric

14. Name the sphincter present at the junction of oesophagus and stomach.
    Gastro-Oesophageal sphincter.

15. Mention the function of pyloric sphincter.
    Ans: It guards the opening of the stomatch into the duodenum.

16. List the different regions of the small intestine.
    Ans: Duodenum, jejunum and ileum

17. Name the vestigial organ associated with Human digestive system.
    Ans: Vermiform appendix
18. Name the glands associated with the alimentary canal.
    Ans: Salivary glands, the liver and the pancreas.
19. Name the structural and functional units of liver.
    Ans:Hepatic lobules
20. Where do we find the sphincter of Oddi?
    Ans: The opening of Hepata-pancreatic duct into the duodenum is guarded by a sphincter called sphincter of oddi.
21. What is a bolus?
    Ans: Masticated food particles mixed with the mucus present in the saliva is called bolus.
22. What is Deglutition?
    Ans: The movement of bolus from the oral cavity into the ossophagus through the pharynx is known as deglutition /swallowing.
23. Define peristalsis.
    Ans: The successive waves of muscular contractions of the alimentary canal is called as peristalisis.
24. Name the enzymes present in the oral cavity.
    Ans: Salivary amylase
25. Which is the antibacterial agent present in the saliva?
    Ans: Lysozyme
26. What is chyme?
    Ans: Partially digested food mixed with the acidic gastric juice of the stomach is called the chyme.
27. Name the proteolytic enzyme found in the gastric juice of infants.
    Ans: Pepsin
28. Name two enzymes present in the pancreatic juice.
    Ans: Trypsin, chymotrypsin, carboxypeptidase, amylases, lipases & nucleases (any 2)
29. Mention the importance of enterokinase enzyme.
    Ans: Enterokinase enzyme helps in activating inactive trypsinogen to active trypsin.
30. What is the function of goblet cells?
    Ans: Goblet cell helps in secretion of mucus.
31. Where is Ileo-caecal value located?
    Ans: Ileo caecal valve is located at the junction of the small intestine and the caecum.
32. What are micelles?
    Ans: Small droplets of fat surrounded by a water soluble layer are called micelles.
33. What are chylomicrons?
    Ans: Fat globules (micelles) coated with a protein coat are called as chylomicrons.
34. Define assimilation.

Ans: The absorbed substances of the food on reaching the tissue is utilized by the tissue for various activities. This process is called as assimilation.

35. Name the 3 parts of the colon?
    Ans: Ascending colon, transverse colon an decending colon.

36. In which wall layer are the duodenal glands located.
    Ans: Sub Mucosa.
37. Why are the villi present in the small intestine?
    Ans: Villi in the small intestine increases the surface area for absorption
38. Name the large lymphatic vessel present in villi.
    Ans: Lacteal.
39. Where are crypts of lieberkuhn located?
    Ans: Crypt of Lieberkuhn is located at the basal junction of 2 villi.
40. Name the connective tissue sheath that covers the hepatic lobules.
    Ans: Glisson's capsule
41. Where is bile stored?
    Ans: Gall bladder
42. Name the duct arising from the gall bladder.
    Ans: Cystic duct
43. Analogy : Buccal cavity : Bolus : : stomach :Chyme
44. What protects the gastric mucosa from the action of conc.Hcl.
    Ans: The mucus and bicarbonates present in the gastric juice protects the mucosal epithelium from excoriation by the HCl.
45. What is intestinal juice called as?
    Ans: Succus entericus
46. Mention the 2 ways by which the activities of gastro intestinal tract is controlled.
    Ans: The activities of the gastro intestinal tract is controlled by the CNS and various hormones of the gastro intestinal glands.
47. In which part of the small intestine does digestion take place?
    Ans: Duodenum
48. What controls the reflex of vomiting?
    Ans: The reflex of vomiting is controlled by the vomit centre in the modulla.
49. What is the function of HCl in the stomach?
    Ans: HCl provides the acidic P^H [P^H – 1.8] required for pepsin to act/converts inactive pepsinogen to active pepsin.

Questions carry two marks:

1. Name the different types of teeth present in the oral cavity?
   Ans: The different types of teeth are
   a) incisors b) canines c) pre-molars and d) molars
2. Mention the four different layers found in the transverse section of gut?
   Ans: The four different layers found in the transverse section of gut are
   a) Serosa b) muscularis c) sub-mucosa and d) mucosa
3. Write about the activity of protein digesting enzymes of pancreatic juice.
   a) The pancreatic juice has inactive enzymes like trypsinogen, chymotrypsinogen and procarboxypeptidase.
   b) Trypsinogen is activated by enterokinase secreted by intestinal mucosa and converted to trypsin.
   c) Trypsin activates other two enzymes.
   d) Trypsin, chymotrypsin and carboxypeptidase convert proteins, peptones and proteoses into dipeptides.
4. Comment on the structure and function of tongue in the oral cavity.

Ans: Tongue is a highly muscular organ which is freely movable and attached to the floor of the oral cavity by frenulum. On it's upper surface it has small projections called papillae bearing tastebuds. It helps in the mixing of the food particles with saliva and in detecting the taste of the food.

5. Mention the functions of
   c) goblet cell b)Microvilli
   Ans: A) Goblet cell – to secrete mucus.
   b) Micro villi – increase the surface area of the intestine and help in absorption of digested food.
6. Name the three pairs of salivary glands and mention their location in the oral cavity.
   Ans: The three pairs of salivary glands are
   a) Parotid gland present in the cheek region.
   b) Sub-maxillary or sub-mandibular gland present in the lower jaw.
   c) Sub-lingual gland present below the tongue.
7. Comment on the exocrine and endocrine functions of pancreas.
   Ans: Exocrine functions of pancreas is to secrete an alkaline pancreatic juice containing digestive enzymes [trypsin, chymotrypsin and carboxypeptidase]
   Endocrine functions of pancreas is to secrete hormones like insulin and glucagon
8. Draw a neat labelled diagram of a section of small intestinal mucosa showing villi? - diagram from text book

9. Explain the function of salivary amylase.
   Ans: Salivary amylase hydrolyses starch into disaccharide maltose at pH 6.8.
10. Mention the three types of cells of the gastric glands and list their functions.
    Ans: Gastric glands have three major types cells namely
    a) mucus neck cells which secrete mucus.
    b) Peptic or chief cells which secrete the proenzyme pepsinogen
    c) Parietal or oxyntic cells which secrete HCl and intrinsic factor to absorb Vitamin B12.
11. Describe the role of Bile in digestion.
    Ans: Bile containing bile pigments (bilirubin, and bili-verdin), bile salts, cholesterol and phospholids, are released through the hepato-pancreatic duct into duodenum. They help in emulsification of fats into very small micelles and to activate lipase.
12. List the functions of Lipases & Nucleases.
    Ans: The functions of
    a) Lipase : hydrolyzing Fat into diglycerides into monoglycerides
    b) Nuclease: Present in Pancreatic juice, hydrolysing Nuclie acids into nucleotides into nucleosides.
13. Differentiate between Absorption and assimilation.
    Ans: Absorption is the process by which the end products of digestion pass through the intestinal mucosa into the blood on lymph.
    Assimilation is a process where the absorbed food finally reaches the tissues and is used for various activities.
14. Mention the symptoms in a)Jaundice b)Indigestion.
    Ans: Jaundice: Skin and eyes turn yellow due to deposition of bile pigments.
    Indigestion : Food is not properly digested leading to feeling of fullness.
15. How are disaccharides digested in the duodenum? Explain with an example.
    Ans: Disaccharides are broken down to monosaccharides in the duodenum as follows:-

Mattose $\xrightarrow{mattase}$ Glucose + Glucose

or

Lactose $\xrightarrow{Lactase}$ Glucose + Galatose

Or

Sucrose $\xrightarrow{sucrase}$ Glucose + Fructose

16. Draw a labeled diagram showing the duct system of liver, gall bladder and pancreas. - diagram from text book

17. Write a note on the duct system of liver, gall bladder and pancreas.
    Ans: The bile secreted from the liver lobule passes through the hepatic ducts and is stored in the gall bladder. The duct of the gall bladder along with hepatic duct from the liver forms the common bile duct. The bile duct and pancreatic duct open together into duodenum as the common hepato pancreatic duct.
18. What are the components of saliva?
    Ans: Components of saliva
    a) water b) mucus c) Electrolytes like Na^+, K^+ Cl^-, HCO_3^-
    d) Lysozyme e) Enzyme – salivary amylase
19. How is the acidic chyme neutralized in the duodenum?
    Ans: a) The mucus and the bicarbonates from the pancreas b) bicarbonates secreted by Brunners gland in duodenum protect the intestinal mucosa from the effect of acidic chyme.
20. List the two functions of large intestine:
    Ans: The functions of large intestine are
    a) absorption of some water, minerals and a few drugs.
    b) Secretion of mucus which helps in adhering the waste particles together and lubricating it for easy passage.
21. Differentiate between diarrhhoea and constipation.
    Ans:

Diarrhoea	Constipation
Abnormal and frequent bowel movement.	Irregular bowel movement
Increased liquidity of faecal discharge	Faecal matter retained within the recturn.

22. List the causes for indigestion.
    Causes for indigestion are
    a) inadequate enzyme secretion b) anxiety
    c) food poisoning d) over eating
    e) intake of spicy food

Questions carry four marks:

1. Describe the structure of liver
2. Explain the process of protein digestion in the stomach
3. Explain the process of fat digestion and absorption in the alimentary canal
4. List all the enzymes present in the pancreatic juice and mention their action

5. Draw a neat labeled diagram of the section of small indestinal mucosa showing villi
6. Describe & Draw the four layers of the alimentary canal wall
7. Describe various structural & functional features of the alimentary canal mucosa
8. Write a note on the regulation of gastro intestinal tract.

Questions carry five marks:

1. Draw a neat labeled diagram of the alimentary canal in man
2. Discuss the main steps involved in the process of protein digestion in different parts of the alimentary canal
3. How are nutrients absorbed in the small intestine?
4. Explain how proteins are digested in the alimentary canal
5. Explain the role of intestinal juice in digestion

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