Chapter 3

Digestion and Absorption

Solutions (Set-1)

SECTION - A

School/Board Exam. Type Questions

Very Short Answer Type Questions :

1. Name the secretions of goblet cells and parietal cells of human stomach.

Sol. Goblet cells $\rightarrow$ Mucus

Parietal cells $\rightarrow$ HCl

2. Why saliva is antibacterial in nature?

Sol. Because in saliva, lysozyme is present which acts as an antibacterial agent.

3. Name one organ of human body which has both exocrine and endocrine functions.

Sol. Pancreas

4. What is emulsification?

Sol. Breaking down of fats into very small droplets with the help of bile juice.

5. Give the term for the presence of different types of teeth.

Sol. Heterodont

6. Name the cells of gastric glands which secrete pepsinogen.

Sol. Peptic cells or chief cells.

7. Give the term for a semidigested gastric food.

Sol. Chyme

8. Name the chemical substance which changes pepsinogen into pepsin.

Sol. HCl

9. Name the enzyme present in human saliva.

Sol. Salivary amylase or ptyalin.

10. What is lysozyme?

Sol. It is an antibacterial agent present in the saliva.

Short Answer Type Questions :

11. What would happen if bile is not secreted?

Sol. (a) Proper alkaline medium will be not be maintained in small intestine, so there will be decrease in activity of pancreatic and intestinal enzymes.

(b) No emulsification of fats occurs, so the fats remain undigested and may appear in the faeces.

12. Write down the factors which protect the gut lining from its own secretion of proteases?

Sol. (a) Proteolytic enzymes are secreted in inactive form (zymogen) in the gut wall.

(b) Mucus has buffering action and protective function due to its alkaline nature.

13. Write two functions of liver.

Sol. (a) Liver secretes bile which helps in emulsifying the fats.

(b) It is seat of glycogenesis, glycogenolysis, deamination, detoxification and RBCs formation [in foetal life] etc.

14. What is the source of saliva? Mention its composition.

Sol. Saliva is secreted by salivary glands. Saliva is composed of 99.5% water, 0.2% minerals, mucin and a starch splitting enzyme called salivary amylase and bacterocidal enzyme lysozyme.

15. How are carbohydrates digested in the buccal cavity?

Sol. In buccal cavity, food is mixed with saliva which contains a starch splitting [salivary amylase/ptyalin] enzyme. It hydrolyses about 30% of starch into maltose, isomaltose and limit dextrins at 6.8 pH.

16. What are microvilli? State their function.

Sol. Microvilli are the finger-like projections of mucosal cells of intestine. These increase the surface area of digestion and absorption of nutrients.

17. Name the source of enterokinase and mention its action.

Sol. Enterokinase is secreted by intestinal mucosa. It activates trypsinogen into trypsin.

18. What is source of HCl? Give its function.

Sol. (a) HCl is secreted by oxyntic cells of the gastric glands.

(b) HCl stops the action of salivary amylase, activates pepsinogen into pepsin, kills the bacteria in the food; and provides acidic medium in the stomach.

19. Mention any two structural features of the small intestine which add to its absorptive capacity.

Sol. (a) Presence of villi in the inner surface of small intestine.

(b) Presence of microvilli on the free surface of intestinal epithelium.

20. Name the organs of digestive system in man.

Sol. The human digestive system consists of the alimentary canal, which has the following parts – buccal cavity oesophagus, stomach, small intestine (duodenum, jejunum and ileum) and large intestine (caecum, colon and rectum). Liver, salivary glands and pancreas are the associated glands.

21. State the functions of intestinal juice.

Sol. Intestinal juice completes the digestion of food. It converts semidigested proteins into amino acids, carbohydrates into glucose, and fats into fatty acids and glycerol.

22. What happens to the undigested food after absorption?

Sol. The undigested food is collected by the large intestine, where it gets converted into faeces. Finally, the faeces released from the body through anus.

23. How is food pushed from food pipe into the stomach?

Sol. The contraction and expansion movement of the walls of the food pipe pushes the slightly digested food into the stomach. These movements are called peristalsis.

24. What is glottis and epiglottis?

Sol. Glottis is the opening of the wind pipe which allows air to enter into it (trachea). A cartilaginous flap called epiglottis prevents the entry of food into the glottis during swallowing.

25. (i) Give the location of Kupffer's cells in human digestive system and state their function.

(ii) What is sphincter of Oddi?

Sol. (i) These are present in liver. They are phagocytic cells and eat worn out RBCs, WBCs and bacteria.

(ii) The bile duct and the pancreatic duct open together into the duodenum by a common hepatopancreatic duct. This duct is guarded by a sphincter called as sphincter of Oddi.

26. (i) Give role of rennin in infants.

(ii) What is the role of mucus and bicarbonates present in the gastric juice?

Sol. (i) Rennin is a proteolytic enzyme found in the gastric juice of infants which helps in the digestion of milk.

(ii) The mucus and bicarbonates present in the gastric juice play an important role in lubrication and protection of the mucosal epithelium from excoriation by the highly concentrated HCl.

27. Give a note on the role of pancreatic juice, secreted from exocrine part of pancreas.

Sol. The pancreatic juice contains some inactive enzymes such as – trypsinogen, chymotrypsinogen, and other enzymes include procarboxypeptidases, amylases, lipases and nucleases. Trypsinogen is activated by an enzyme, enterokinase, secreted by the intestinal mucosa into active trypsin, which in turn activates the other enzymes in the pancreatic juice.

28. Give a note on intestinal juice.

Sol. The secretions of the crypts of Lieberkuhn of the intestinal mucosa alongwith the secretions of the goblet cells constitute the intestinal juice or succus entericus. This intestinal juice contains a variety of enzymes like disaccharidases, dipeptidases, lipases, nucleosidases, etc.

29. What will be end product when

(i) Dipeptidases acts on dipeptides

(ii) Maltase acts on maltose

(iii) Lactase acts on lactose

(iv) Sucrase acts on sucrose

Sol. (i) Amino acids

(ii) Glucose + Glucose

(iii) Glucose + Galactose

(iv) Glucose + Fructose

30. Give an account of the functions of large intestine.

Sol. The functions of large intestine are:

(a) Absorption of water, some minerals and certain drugs.

(b) Secretion of mucus which helps in adhering the waste (undigested) particles together and lubricating it for an easy passage.

Long Answer Type Questions :

31. (i) Which substances are present in the gastric juice? What are their functions?

(ii) In which juice is trypsin present?

Sol. (i) Gastric juice contains three important substances:

(a) Hydrochloric acid (HCl): It makes the medium acidic, which is essential for the digestion of proteins.

(b) Enzyme pepsin and rennin: Pepsin is the principal protein-digesting enzyme. It converts proteins into proteoses and peptones. Rennin acts upon milk proteins.

(c) Mucus: It is secreted in large quantities. It protects the inner layer of stomach and lubricates the passage of food.

(ii) Trypsin is present in pancreatic juice as typsinogen.

32. (i) What are the various processes that occur in the duodenum?

(ii) How does absorption take place in the small intestine of human beings?

Sol. (i) Processes that occur in the duodenum are

(a) Emulsification of fats by bile juice. Digestion of fats by pancreatic lipase.

(b) Digestion of proteins by trypsin and chymotrypsin.

(c) Digestion of starch by pancreatic amylase.

(d) Bile and bicarbonate ions make the medium alkaline.

(e) Digestion of nucleic acid by nucleases.

(ii) Most of the digested food is absorbed in the small intestine. This part contains finger-like projections or villi. These villi increase the surface area for absorption. The digested food is absorbed by passive, active or facilitated transport mechanisms. The absorbed food goes to the blood capillaries or lacteals present in villi.

33. (i) How are protein digested in stomach?

(ii) State one difference between active and passive absorption.

Sol. (i) In stomach, food is mixed with gastric juice which contains a strong proteolytic enzyme pepsin. It hydrolyses the proteins into peptones and proteoses in an acidic medium provided by HCl. Rennin enzyme of gastric juice causes curdling of milk and increases the period of action of pepsin on the milk proteins.

(ii) Passive absorption operates along the concentration gradient, while active absorption operates against concentration gradient hence requires energy (ATP).

34. Give an account of gastrointestinal hormones.

Sol.

Hormone	Source secretion	Stimulus to	Target / Action
Gastrin	Pyloric stomach	Vagus nerve activity, peptides and proteins in stomach	Secretory cells and muscles of stomach; secretion of HCl and stimulation of gastric mobility
Cholecystokinin (CCK)	Small intestine (Duodenum)	Food (fatty chyme and amino acids) in duodenum	Gall bladder; contraction of gall bladder (bile release). Pancreas- release of pancreatic juice
Secretin	Intestinal wall (Duodenum)	Food and strong acid in stomach and intestine	Pancreas-secretory cells and muscles of stomach; secretion of water and bicarbonate ($NaHCO_3$); inhibition of gastric motility
Gastric Inhibitory Peptide (GIP)	Small intestine (Duodenum)	Monosaccharides and fats (fatty chyme) in duodenum	Gastric mucosa and muscles; inhibition of gastric secretion and motility (slowing food passage)

35. (i) Draw a labelled diagram of portion of alimentary canal showing the location of gall bladder and pancreas with their ducts opening into the duodenum.

(ii) Name the largest gland of human body. Draw a diagram showing its lobes.

Sol. (i)

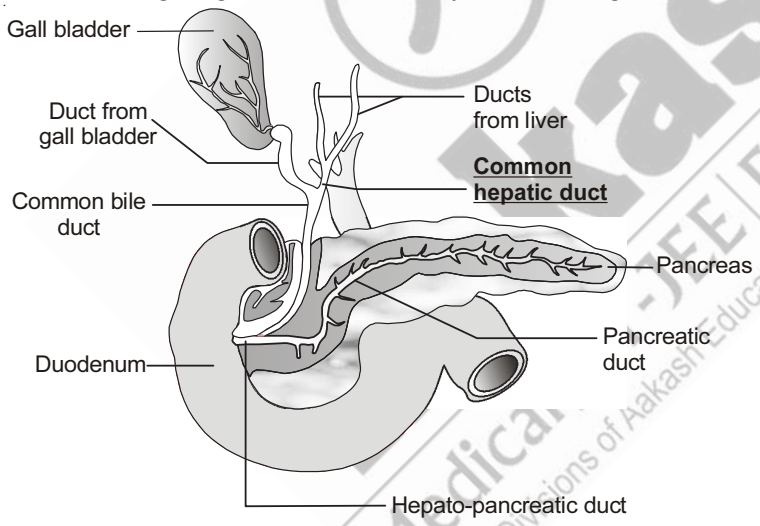


Figure. The duct systems of liver, gall bladder and pancreas

(ii) Largest gland of human body is liver.

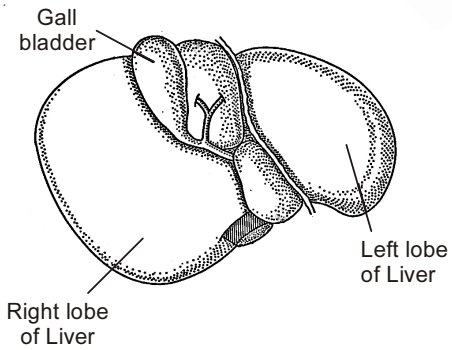


Figure. Human liver and its parts

36. (i) Why is stomach unable to digest carbohydrates?

(ii) What do you understand by term emulsification of fats?

(iii) What function does gastric lipase perform?

(iv) Which components of food are not digested in buccal cavity?

Sol. (i) Stomach is unable to digest carbohydrates because the medium in stomach is strongly acidic. Carbohydrate digesting-enzymes are not effective at such acidic pH.

(ii) Breaking down of the fats into very small micelles with the help of bile is known as emulsification.

(iii) Gastric lipase partially breaks lipids.

(iv) Proteins and fats are not digested in buccal cavity.

37. (i) Differentiate between ingestion, digestion and egestion.

(ii) Write down the function of the following structures.

(a) Epiglottis

(b) Gall bladder

(c) Pyloric sphincter

(d) Pancreatic duct

Sol. (i) The intake of food by an organism is called ingestion. The conversion of complex food particles, into small absorbable molecules is called digestion. The removal of undigested food from the body is called egestion.

(ii) **(a) Epiglottis:** It closes the glottis during deglutition.

(b) Gall bladder: It stores bile secreted by liver.

(c) Pyloric sphincter: It guards the opening of pyloric stomach into duodenum.

(d) Pancreatic duct: It carries pancreatic juice to duodenum.

38. Discuss the role of salivary glands, liver and pancreas in the process of digestion in a human being.

Sol. (a) Salivary glands : There are three pairs of salivary glands (parotids, sub-lingual and sub-maxillary) which are located just outside the buccal cavity. The secretion of these glands is called saliva. Saliva is very important for digestion as it contains starch-digesting enzyme ptyalin. Saliva also contains mucus, which lubricates the food passage and the teeth and tongue with the help of saliva masticate and mixup the food thoroughly.

(b) Liver: It is the largest gland of the body. It is placed in the upper right side of the abdomen. Liver secretes a watery, alkaline secretion, known as bile. It contains bile pigments and bile salts. The bile secreted by the liver cells is concentrated and stored in gall bladder

Bile does not contain any enzyme. But it serves alkaline medium in duodenum. It also helps to emulsify fats. (Emulsification means breaking of fats into small globules.)

(c) Pancreas: It is a mixed gland because it has exocrine part (enzyme secreting) as well as endocrine part (hormone secreting). Pancreas lies parallel to and beneath the stomach.

Exocrine region of pancreas secretes digestive enzymes (like trypsin, chymotrypsin and amylase etc.) and the endocrine region secretes hormones (like insulin and glucagon). Both bile and pancreatic juice enter duodenum through a common duct.

39. Describe the mechanism of digestion of various components of the food in human alimentary canal.

Sol. Digestion is the process of conversion of complex food particles into simple ones so that they can be absorbed. Our food consists of carbohydrates, fats, proteins, vitamins, minerals and water. Out of these vitamins, minerals and water are already simplified therefore these do not undergo digestion. These are absorbed as such.

So, digestive action takes place only on carbohydrates, proteins and fats. During digestion, carbohydrates are converted into monosaccharides, proteins into amino acids and fats into fatty acids and glycerol.

Mechanism: When food is ingested, it is chewed and masticated with the help of teeth and tongue. Saliva contains an enzyme salivary amylase, which converts carbohydrates (starch) into maltose. But there is no digestion of proteins and fats in the buccal cavity.

When food reaches stomach, the digestion of proteins begins. Gastric juice, secreted by stomach wall, contains HCl and various enzymes and also makes the medium acidic. Gastric lipase may digest a little amount of fats, but there is no digestion of carbohydrates in stomach.

Now the food enters in the small intestine. In duodenum, bile juice and pancreatic juice get mixed with the semi-digested food. Bile makes the medium alkaline and also emulsifies the fats. Pancreatic juice contains amylase, which converts remaining carbohydrates (starch) to maltose. Trypsin and chymotrypsin of pancreatic juice convert partially digested proteins to dipeptides.

In small intestine, intestinal juice plays the final role. It contains enzymes which convert maltose and all other disaccharides to monosaccharides like glucose and fructose. Similarly, enzymes like peptidases convert all peptides into amino acids. Intestinal lipase acts on emulsified fats and converts them into fatty acids and glycerol. In this way, all components of food get digested completely in small intestine.

40. (i) Which structure prevents the entry of food into the wind pipe when it is swallowed?

(ii) Why is the stomach and intestinal wall not digested by enzymes?

Sol. (i) Glottis is the opening of trachea (wind pipe). At the time of swallowing, a cartilaginous flap called epiglottis prevents the entry of food into windpipe.

(ii) The entire digestive tract has mucus glands that produce mucus. This mucus lubricates the food and sticks it together. It also lubricates the digestive tract so that food slips through it easily. This prevents injury to the delicate mucus membrane. The mucus coat also protects the underlying cells from digestive enzymes.

41. Write a note on process of absorption of digested food in small intestine.

Sol. Absorption occurs in the small intestine. It takes place by simple diffusion, osmosis and facilitated diffusion, active transport and endocytosis. Water, glucose, fructose, amino acids, and mineral salts are absorbed into the blood. Long chain fatty acids, monoglycerides and diglycerides combine with bile salts to form water soluble molecular aggregates, the micelles. They are then absorbed from the micelles into the intestinal cells, where they separate from bile salts and combine to form fats. The latter pass from the cells as fine droplets, the chylomicrons, into the lacteals.

42. Give the function of following enzymes

(i) Chymotrypsinogen

(ii) Procarboxypeptidases

(iii) Dipeptidases

(iv) Pepsinogen

(v) Salivary amylase

Sol. (i) Chymotrypsinogen $\xrightarrow{\text{Trypsin}}$ Chymotrypsin

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

(ii) Procarboxypeptidases $\xrightarrow{\text{Trypsin}}$ Carboxypeptidases

Peptides $\xrightarrow{\text{Carboxypeptidases}}$ Dipeptides + Amino acids

(iii) Dipeptides $\xrightarrow{\text{Dipeptidases}}$ Amino acids

(iv) Pepsinogen $\xrightarrow{\text{HCl}}$ Pepsin

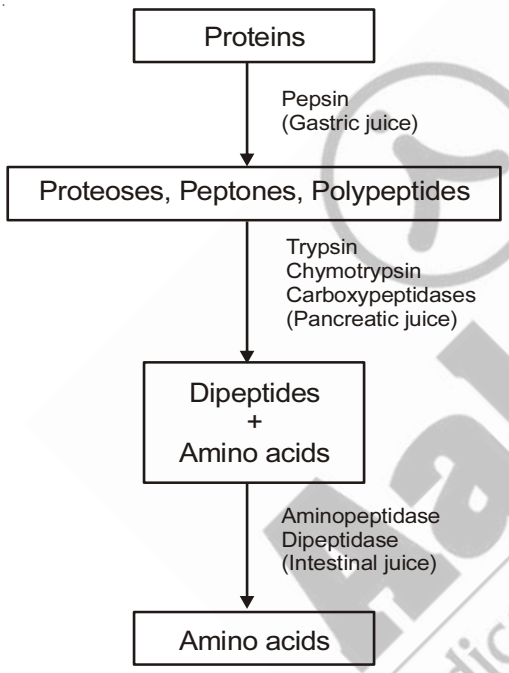
Proteins $\xrightarrow{\text{Pepsin}}$ Proteoses + Peptones

(v) Polysaccharide (Starch) $\xrightarrow{\text{Salivary amylase}}$ Disaccharide (Maltose)

43. (i) Give a note on digestion of proteins in brief.

(ii) Write the name of four gastrointestinal hormones.

Sol. (i)



(ii) (a) Gastrin (b) Cholecystokinin

(c) Secretin (d) Gastric inhibitory peptide (GIP)

44. (i) Salivary glands are located in which part of the body?

(ii) What type of food material is digested by ptyalin enzyme?

(iii) Pepsin digests which component of food?

(iv) At which, pH does ptyalin work?

(v) Which substance maintains the strong acidic pH of stomach?

Sol. (i) Buccal cavity

(ii) Starch (carbohydrate)

(iii) Proteins

(iv) 6.8

(v) HCl (Hydrochloric acid) secreted by oxyntic cells.

45. Labelled the following from A to J in the given diagram of human digestive system.

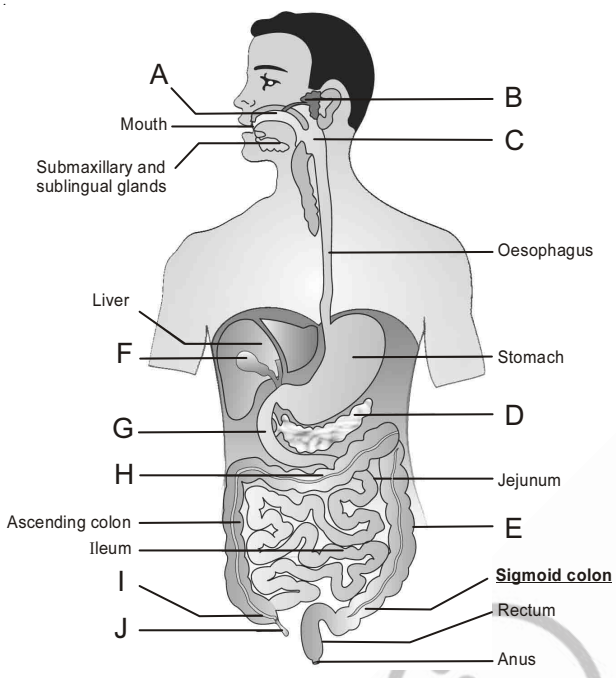


Fig. : Human digestive system

Sol. A – Oral cavity

B – Parotid gland

C – Pharynx

D – Pancreas

E – Descending colon

F – Gall bladder

G – Duodenum

H – Transverse colon

I – Caecum

J – Vermiform appendix

SECTION - B

Model Test Paper

Very Short Answer Type Questions :

1. Which type of dentition is found in man?

Sol. Thecodont, Heterodont and Diphyodont type of dentition found in man.

2. Give the role of enzyme enterokinase in human digestive system.

Sol. Enterokinase activates trypsinogen.

$$\underset{\text{(Inactive)}}{\text{Trypsinogen}} \xrightarrow{\text{Enterokinase}} \underset{\text{(Active)}}{\text{Trypsin}}$$

3. Name the thin connective tissue sheath which coveres each hepatic lobule?

Sol. Glisson's capsule.

4. Give the location of crypts of Lieberkuhn.

Sol. These are present between the bases of villi of intestine (small intestine).

5. Which gland is responsible for secretion of hormone insulin and glucagon?

Sol. Endocrine part of pancreas is responsible for secretion of insulin and glucagon.

6. Which structure serves as a common passage for food and air?

Sol. Pharynx serves as a common passage for food and air.

7. Which portion (or part) of stomach opens into duodenum?

Sol. Pyloric part of stomach opens into duodenum.

8. Which organ will be affected while a person is suffering from jaundice?

Sol. Liver.

9. Name the accessory digestive glands which help in the process of digestion?

Sol. Salivary glands, liver and pancreas are the accessory glands help in digestion.

10. From which part of the alimentary canal does digestion of proteins start?

Sol. Protein digestion starts in stomach.

Short Answer Type Questions :

11. What do you mean by the term vomiting?

Sol. It is the ejection of stomach contents through the mouth. This reflex action is controlled by the vomit centre in the medulla. A feeling of nausea precedes vomiting.

12. Briefly comment on absorption in mouth.

Sol. Certain drugs coming in contact with the mucosa of mouth and lower side of the tongue are absorbed into the blood capillaries lining them.

13. Gastrointestinal hormones are secreted by which part of alimentary canal?

Sol. Gastrointestinal hormones produced by the gastric and intestinal mucosa.

14. How does facilitated transport take place?

Sol. Some substances like glucose and some amino acids are absorbed with the help of the carrier ions like Na^+. This mechanism is called the facilitated transport.

15. Give the name of two bile pigments and two bile salts each.

Sol. **Bile pigments:**

(i) Bilirubin (ii) Biliverdin

Bile salts:

(i) Sodium glycocholate (ii) Sodium taurocholate

16. (a) Name any three inactive enzymes of pancreatic juice?

(b) Name the duct by which pancreatic juice and bile are released into duodenum?

Sol. (a) (i) Trypsinogen

(ii) Chymotrypsinogen

(iii) Procarboxypeptidases

(b) Hepatopancreatic duct.

Short Answer Type Questions :

17. What will be the end product when pancreatic juice acts upon proteins, carbohydrates and fats?

Sol. (i) Proteins, Peptones, Proteoses $\xrightarrow[\text{Chymotrypsin}]{\text{Trypsin}}$ Dipeptides

(ii) Polysaccharides (starch) $\xrightarrow{\text{Amylase}}$ Disaccharides (maltose)

(iii) Fats $\xrightarrow{\text{Lipases}}$ Diglycerides $\longrightarrow$ Monoglycerides

So, dipeptides, disaccharides and fatty acid-monoglycerides are end products.

18. Draw a labelled diagram showing the duct systems of liver, gall bladder and pancreas.

Sol.

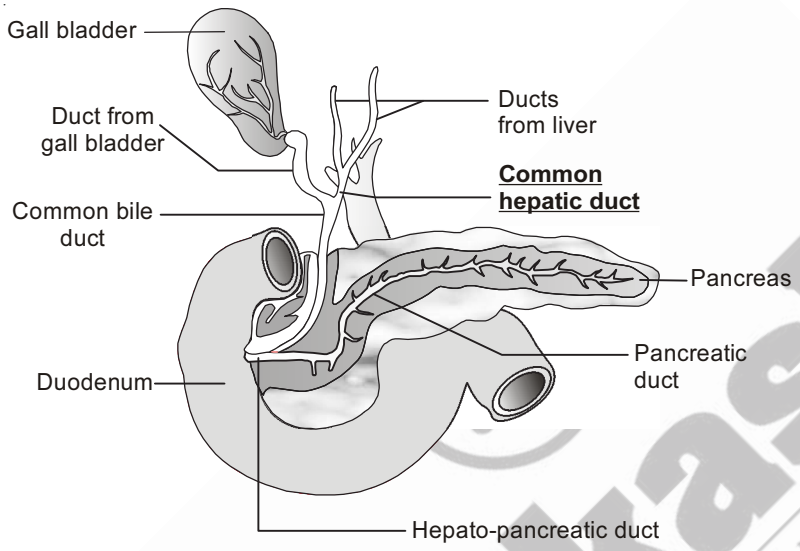


Figure. The duct systems of liver, gall bladder and pancreas

19. (a) What is the role of water in our body?

(b) What do you mean by digestion?

(c) What is frenulum?

Sol. (a) The water we take in, plays an important role in metabolic processes and also prevents dehydration of the body.

(b) The process of conversion of complex food substances into simple absorbable form is called digestion.

(c) It is a structure by which the tongue is attached to the floor of the oral cavity.

20. Write a short note on 'pancreas'.

Sol. It is a compound (both exocrine and endocrine) elongated glandular organ, situated between the limbs of the U-shaped duodenum. The exocrine portion secretes an alkaline pancreatic juice containing enzymes and the endocrine portion secretes hormones, insulin and glucagon.

21. (a) Name the substances which are absorbed by simple diffusion.

(b) Name the parts of alimentary canal in which absorption takes place.

Sol. (a) Small amounts of monosaccharides like glucose, amino acids and some of the electrolytes like chloride ions are generally absorbed by simple diffusion.

(b) Absorption of substances takes place in different parts of the alimentary canal, like mouth, stomach, small intestine and large intestine.

22. What will be end product when
    (a) Maltase acts on maltose
    (b) Lactase acts on lactose
    (c) Sucrase acts on sucrose

Sol. (a) Maltose $\xrightarrow{\text{Maltase}}$ Glucose + Glucose; glucose is the end product.

(b) Lactose $\xrightarrow{\text{Lactase}}$ Glucose + Galactose; glucose and galactose are the end products.

(c) Sucrose $\xrightarrow{\text{Sucrase}}$ Glucose + Fructose; glucose and fructose are the end products.

Long Answer Type Questions :

23. Draw a well-labelled diagram of human digestive system and give the function of pharynx and gall bladder.

Sol.

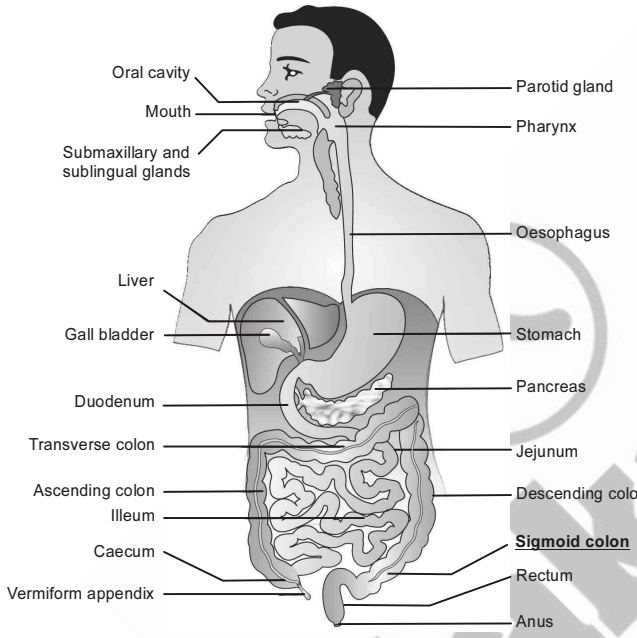


Figure. Human Digestive System

Function:

(i) Pharynx: It serves as a common passage for food and air.

(ii) Gall bladder: In gall bladder, the bile is stored and concentrated.

24. (a) Give a note on following disorders of digestive system
    (i) Diarrhoea
    (ii) Indigestion
    (b) What is the source of secretion of following gastrointestinal hormones?
    (i) Gastrin
    (ii) Secretin

Sol. (a) (i) Diarrhoea: The abnormal frequency of bowel movement and increased liquidity of the faecal discharge is known as diarrhoea. It reduces the absorption of food.

(ii) Indigestion: In this condition, the food is not properly digested leading to a feeling of fullness. The cause of indigestion are inadequate enzyme secretion, anxiety, food poisoning, overeating, and spicy food.

(b) (i) Gastrin: Source of gastrin is endocrine cells of stomach.

(ii) Secretin: Source of secretin is endocrine cells of intestinal wall (duodenum).

❑ ❑ ❑

Solutions (Set-2)

Objective Type Questions

(Digestive System)

1. The major components of food are

(1) Carbohydrates (2) Proteins

(3) Fats (4) All of these

Sol. Answer (4)

Carbohydrates, fats and proteins are macronutrients or proximate principles of food because these components constitute the energy source for the production of heat and different organic function and are required in large quantity in our body.

2. In which type of dentition, each tooth in the buccal cavity is embedded in a socket of jaw bone?

(1) Heterodont (2) Thecodont

(3) Diphyodont (4) Monophyodont

Sol. Answer (2)

Because thecodont is a condition in which teeth are embedded in sockets and have well developed roots.
Monophyodont : Teeth which erupt once in life.

Diphyodont : Teeth which erupt twice in life.

Heterodont : Human (Adult) has 32 permanent teeth which are of four different types *i.e.,* incisors, canines, premolars, molars. Such type of dentition is called **Heterodont**.

3. The dental formula of human beings is

(1) $\frac{2123}{2123}$ (2) $\frac{2021}{2021}$

(3) $\frac{2321}{2321}$ (4) $\frac{2133}{2133}$

Sol. Answer (1)

$\frac{2123}{2123}$ (Adult)

Incisors Canines Premolars Molars

$\frac{2102}{2102}$ (Childhood)

4. The common passage for food and air is

(1) Oesophagus (2) Pharynx

(3) Trachea (4) Glottis

Sol. Answer (2)

Pharynx is a common passage for food and air.

Oesophagus : Food pipe.

Trachea : Wind pipe

Glottis : Opening of larynx that remains covered by epiglottis during swallowing.

5. All of the following are the parts of large intestine, **except**

(1) Caecum (2) Colon (3) Ileum (4) Rectum

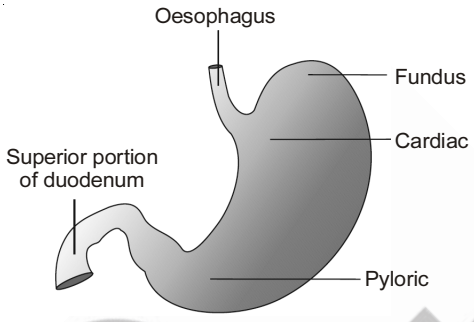
Sol. Answer (3)

Ileum is a part of small intestine.

6. Oesophagus opens in which part of the stomach?

(1) Pyloric (2) Cardiac (3) Fundic (4) Caecum

Sol. Answer (2)



7. How many pairs of salivary glands are present in human beings?

(1) 2 pairs (2) 3 pairs (3) 4 pairs (4) 5 pairs

Sol. Answer (2)

Three pairs of salivary glands are :

(1) Parotid (1 pair)

(2) Sub-maxillary / sub-mandibular (1 pair)

(3) Sub-lingual (1 pair)

8. Which gland is both exocrine and endocrine?

(1) Liver (2) Gall bladder

(3) Glisson's capsule (4) Pancreas

Sol. Answer (4)

As pancreas is a compound gland. So it acts as exocrine and endocrine gland both.

9. Glisson's capsule is related to

(1) Liver (2) Pancreas (3) Lung (4) Pharynx

Sol. Answer (1)

Glisson's capsule is a thin connective sheath which covers hepatic lobule.

10. Endocrine portion of pancreas secretes

(1) Insulin (2) Glucagon (3) Both (1) & (2) (4) HCl

Sol. Answer (3)

α-cells of pancreas $\rightarrow$ Secrete glucagon

β-cells of pancreas $\rightarrow$ Secrete insulin

δ-cells of pancreas $\rightarrow$ Secrete somatostatin

11. Bile is stored and concentrated in

(1) Liver (2) Pancreas (3) Lungs (4) Gall bladder

Sol. Answer (4)

Gall bladder : It removes water and not Na^+ ions from bile and concentrates it.

12. Which of the following organ is present in abdominal cavity, just below diaphragm?

(1) Pharynx (2) Pancreas

(3) Liver (4) Tongue

Sol. Answer (3)

Liver is the largest gland of the body, which is situated in the abdominal cavity, just below the diaphragm. It has two lobes *i.e.,* right and left lobes.

13. Which is the largest gland of human body?

(1) Liver (2) Pancreas

(3) Gall bladder (4) Lung

Sol. Answer (1)

Liver is the largest gland of the body weighing about 1.2 to 1.5 kg in adult human.

14. The wall of alimentary canal from oesophagus to rectum possesses _____ layers.

(1) 2 layers (2) 3 layers (3) 4 layers (4) 5 layers

Sol. Answer (3)

Four layers

Serosa
Muscularis
Sub-mucosa
Mucosa
} Wall of alimentary canal

15. The major functions of buccal cavity is/are

(1) Mastication of food (2) Facilitation of swallowing

(3) Help in secretion of glucagon (4) Both (1) & (2)

Sol. Answer (4)

(1) Mastication of food $\rightarrow$ Function of buccal cavity

(2) Facilitation of swallowing $\rightarrow$ Function of buccal cavity

(3) Help in secretion of glucogon $\rightarrow$ Function of α-cell of pancreas.

(Digestion of food)

16. The antibacterial enzyme, present in saliva that prevents infections is

(1) Maltose (2) Salivary amylase (3) Lysozyme (4) Pepsinogen

Sol. Answer (3)

Maltose $\rightarrow$ Sugar

Salivary amylase $\rightarrow$ Help in digestion of carbohydrate

Pepsinogen $\rightarrow$ Inactive form of pepsin, which help in digestion of protein.

17. HCl secreting cells present in the stomach are

(1) Oxyntic cells (2) Peptic cells (3) Chief cells (4) Mucus neck cells

Sol. Answer (1)

Peptic or chief cell : secrete the proenzyme pepsinogen

Mucus neck cell : secrete mucus

Pepsinogen : Oxyntic or parietal cells : Secret HCl and intrinsic factor.

18. Which enzyme gets activated by HCl secreted from gastric glands?

(1) Trypsinogen (2) Pepsinogen

(3) Renin (4) Chymotrypsin

Sol. Answer (2)

$$\text{Trypsinogen} \xrightarrow{\text{Enterokinase}} \text{Trypsin}$$

$$\text{Pepsinogen} \xrightarrow{\text{HCl}} \text{Pepsin}$$

$$\text{Chymotrypsinogen} \xrightarrow{\text{Trypsin}} \text{Chymotrypsin}$$

Renin $\rightarrow$ Hormone which help in osmoregulation

19. All of the following juices contain enzymes, **except**

(1) Pancreatic juice (2) Intestinal juice

(3) Bile juice (4) Gastric juice

Sol. Answer (3)

Bile contains bile pigments (bilirubin and biliverdin), bile salts (sodium bicarbonate, sodium glycocholate, sodium taurocholate), cholesterol and phospholipids but no enzymes.

20. The breakdown of biomolecules *i.e.* dipeptides, lactose, maltose and sucrose etc. occurs mainly in the

(1) Ileum (2) Pyloric region of stomach

(3) Duodenum region of small intestine (4) Caecum region of large intestine

Sol. Answer (3)

Duodenum region of small intestine. The enzyme required for the breakdown of biomolecules *i.e.* dipeptides, lactose, maltose and sucrose are present in the succus entericus (intestinal juice). Duodenum is chief site of digestion.

21. Enzyme lactase is responsible for the breakdown of lactose into

(1) Glucose + Fructose (2) Glucose + Galactose

(3) Glucose + Glucose (4) Fatty acids + Glycerol

Sol. Answer (2)

$$\text{Lactose} \xrightarrow{\text{lactose}} \text{Glucose + Galactose}$$

22. Crypts of Lieberkuhn are present in

(1) Stomach (2) Pharynx

(3) Oesophagus (4) Intestine

Sol. Answer (4)

Crypts of Lieberkuhn, which are also known as intestinal glands, are present in intestine.

23. The main function of bile is to

(1) Eliminate the waste products

(2) Emulsify the fats

(3) Digest proteins by enzymatic activity

(4) Regulate the digestion process

Sol. Answer (2)

Bile helps in emulsification of fats *i.e.,* breakdown of the fats into very small micelles. As, bile does not have any enzyme, so it does not help in digestion of protein.

24. The wave like muscular contractions in the digestive tract are called

(1) Mastication (2) Assimilation (3) Peristalsis (4) Stimulation

Sol. Answer (3)

During the oesophageal phase of swallowing, food is pushed through the oesophagus by involuntary muscular movements called peristalsis.

Mastication : Chewing of food.

Assimilation : When the absorbed food materials in blood and lymph reach tissue, we utilise them for processes such as like growth, energy and repair.

25. Enzyme trypsinogen is a component of

(1) Mucus (2) Saliva (3) Pancreatic juice (4) Intestinal juice

Sol. Answer (3)

Trypsinogen is inactive form of trypsin.

(Absorption of digested products, Disorders of digestive system)

26. The food that enters into intestine from stomach is

(1) Alkaline chyle (2) Fundus

(3) Acidic chyme (4) Bolus

Sol. Answer (3)

The pH of stomach is low (1.8-3.2), the food that passes from stomach also gets acidic due to the presence of HCl.

27. Absorption of substances takes place in different parts of the alimentary canal. However maximum absorption takes place in

(1) Small intestine

(2) Large intestine

(3) Transverse colon

(4) Ascending colon

Sol. Answer (1)

Absorption of substances takes place in different parts of the alimentary canal, like mouth, stomach, small intestine and large intestine. But maximum absorption occurs in the small intestine.

28. Absorption of water, simple sugars and alcohol etc. takes place in

(1) Mouth (2) Stomach (3) Rectum (4) Large intestine

Sol. Answer (2)

Absorption of substance takes place in different parts of the alimentary canal :

Mouth : Some drugs

Stomach : Water, simple sugar, alcohol, drugs.

Small Intestine : Water, amino acid, sugar, glycerol, fatty acid, minerals, vitamin.

Large intestine : Water, some mineral, drugs.

29. In intestine, the function of microvilli is to

(1) Secrete gastric juice (2) Secrete pancreatic juice

(3) Increase absorptive surface area (4) Secrete hormones

Sol. Answer (3)

Microvilli increase absorptive surface area.

30. Abnormal frequency of bowel movement and increased liquidity of the faecal discharge is known as

(1) Vomiting (2) Diarrhoea (3) Constipation (4) Indigestion

Sol. Answer (2)

Vomiting: It is the ejection of stomach contents through the mouth.

Diarrhoea: The abnormal frequency of bowel movement and increased liquidity of the foecal discharge.

Constipation: In this, faeces are retained within the rectum as the bowel movements occur irregularly.

Indigestion: In this, the food is not properly digested leading to a feeling of fullness.

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