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FBISE Past Papers · Biology Chapter Solutions

Class 10 | Unit 1 : DIGESTIVE SYSTEM

PAST PAPER SOLUTIONS

Paper 1 — 2025, 1st Exam Set 1

Footer code 2SA-I 25006 (B) · Version 20061

No Chapter 1 question in this paper, so no solution is needed.

Paper 2 — 2025, 1st Exam Set 2

Footer code 2SA-I 25006 (D) · Version 22061

No Chapter 1 question in this paper, so no solution is needed.

Paper 3 — 2025, 2nd Exam

Footer code 2SA-II 25006 · Version 22061 · stamped 10/02/2026

No Chapter 1 question in this paper, so no solution is needed.

Paper 4 — 2026 (B)

Footer code 2SA-I 26006 (B) · Version 20061

Section A — MCQ

Q1 (7). The main site of digestion and absorption of food is the: A) Stomach B) Large intestine C) Rectum D) Small intestine

Ans: (D) Small intestine. [Most enzymatic digestion takes place in the duodenum and is completed in the ileum, and most nutrients are absorbed through the villi.]

Section B — Short Questions (Q2)

(iv) (OR) Briefly explain the role of the liver in digestion. [3]

(1) The liver cells manufacture bile, a greenish yellow liquid. It is stored in the gall bladder and is released into the duodenum as soon as food enters it.

(2) Bile emulsifies fats, breaking them into small droplets called emulsion. This gives a large surface area for the action of lipase enzymes.

(3) Bile is alkaline, so it helps to neutralise the acidic chyme and gives the medium in which pancreatic and intestinal enzymes can work. Bile itself has no enzymes.

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(x) Describe the structure of a villus. [3]

(1) Villi (singular: villus) are tiny finger-like projections formed by the internal lining of the small intestine. They increase the surface area for absorption.

(2) Each villus is covered by simple columnar epithelium. Inside it there is a network of blood capillaries and a lymph capillary called a lacteal.

(3) The villus also has goblet cells that secrete mucin to make a protective mucus layer. Between the bases of the villi lie the intestinal crypts, whose cells provide stem cells to renew the epithelium.

Section C — Long Questions

Q5 (OR). Describe the structure and function of human stomach. Also draw its labelled diagram. [3.5 + 1.5]

Structure and function (3.5):

(1) Structure: the stomach is the dilated part of the digestive tube. It is roughly J-shaped and lies somewhat transversely on the left of the abdomen, just beneath the diaphragm. Its wall has layers of muscles.

(2) It has two openings guarded by valves. The cardiac opening (between oesophagus and stomach) is guarded by the cardiac sphincter, and the region around it is the cardiac end. The pyloric opening (stomach into duodenum) is guarded by the pyloric sphincter.

(3) Function: when food arrives, the cardiac sphincter relaxes and the gastric glands secrete gastric juice containing mucus, HCl, pepsinogen and renin.

(4) Mucus coats the wall and prevents its digestion by pepsin. HCl stops salivary amylase, converts pepsinogen into pepsin, gives the acidic medium and kills microorganisms.

(5) Pepsin digests proteins into polypeptides and peptides. Renin (only in infants) helps to digest milk protein.

(6) Churning of the stomach wall mixes the food into a soupy mixture called chyme. When the chyme reaches a certain acidity, the pyloric sphincter relaxes and a little chyme enters the duodenum.

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Labelled diagram (1.5):

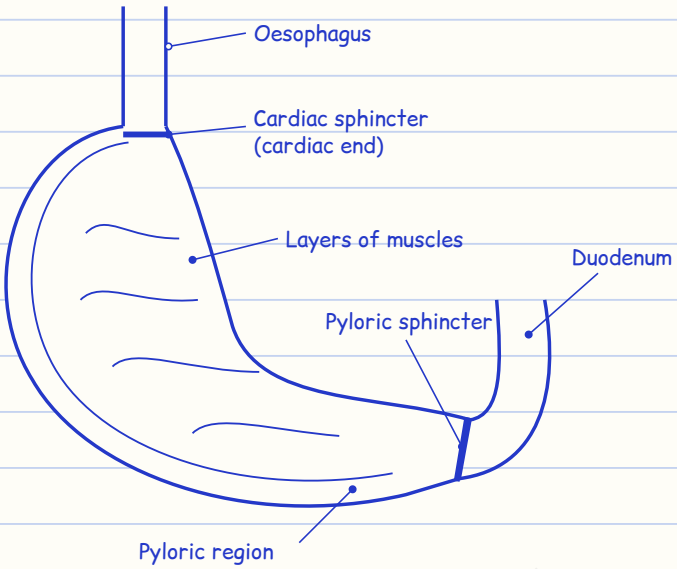


Fig: Structure of human stomach

Paper 5 — 2026 (D)

Footer code 2SA-I 26006 (D) · Version 22061

Section A — MCQ

Q1 (7). Which part of the alimentary canal absorbs water? A) Stomach B) Small intestine C) Oesophagus D) Large intestine

Ans: (D) Large intestine. [Water and some vitamins are absorbed into the blood from the large intestine.]

Q1 (9). Which structure prevents food from entering the trachea during swallowing? A) Epiglottis B) Pharynx C) Larynx D) Bronchi

Ans: (A) Epiglottis. [The epiglottis, a flap of cartilage, covers the glottis so food goes into the oesophagus.]

Section B — Short Questions (Q2)

(iv) (OR) Briefly explain the role of the liver other than digestion. [3]

The liver has many vital roles besides making bile (any six points, 0.5 each):

(1) It stores excess glucose as glycogen.

(2) It converts glycerol and amino acids into glucose molecules.

(3) It removes the amino group from amino acids. This is called deamination.

(4) It converts the ammonia formed into urea.

(5) It synthesises the majority of the plasma proteins.

(6) It destroys old red blood cells.

(7) It stores fat-soluble vitamins (A, D, E and K) and mineral ions such as iron.

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(x) What is a lacteal? What is its function? [1 + 2]

Lacteal (1): a lymph capillary present in the centre of each villus of the small intestine, along with the network of blood capillaries.

Function (2): it absorbs the products of fat digestion, i.e. glycerol and fatty acids, from the villus. They pass into the lymph and are ultimately poured into the blood.

Section C — Long Questions

Q4. Describe the structure and function of the small intestine. [2 + 3]

Structure (2):

(1) The small intestine is the narrow tube between the stomach and the large intestine. It is divided into three parts: duodenum (about 20–25 cm), jejunum (about 2.5 m) and ileum (about 4 m).

(2) The bile duct from the gall bladder, the hepatic duct from the liver and the pancreatic duct from the pancreas empty into the duodenum. Its lining is modified into villi, with intestinal crypts and goblet cells.

Function (3):

(1) Digestion: chyme stimulates the gall bladder to release bile, the pancreas to secrete pancreatic juice and the intestinal glands to secrete intestinal juice. These are alkaline and neutralise the acidic chyme. Bile emulsifies fats; pancreatic amylase, lipase and trypsin digest starch, fats and proteins; erepsin, maltase and lactase finish digestion, which is complete in the ileum.

(2) Absorption: villi give a large surface area. Glucose, amino acids, mineral salts and vitamins pass into the blood capillaries by diffusion and active transport. Glycerol and fatty acids are absorbed by the lacteal. The hepatic portal vein carries the blood to the liver.

(3) Mucus from goblet cells and duodenal glands protects the wall from acidic chyme and from the pancreatic enzymes.

Paper 6 — 2026 (M)

Footer code 2SA-I 26006 (M) · Version 29061

Section A — MCQ

Q1 (7). Which associated organ produces bile? A) Pancreas B) Liver C) Stomach D) Gall bladder

Ans: (B) Liver. [The liver secretes bile. The gall bladder only stores it.]

Section B — Short Questions (Q2)

(iv) (OR) Why is the liver considered an important metabolic organ? Give two reasons. [1.5 + 1.5]

(1) Carbohydrate metabolism: it stores excess glucose as glycogen and converts glycerol and amino acids into glucose, so it helps to keep the blood glucose level steady.

(2) Protein metabolism: it removes the amino group from amino acids (deamination), converts the toxic ammonia into urea and makes most of the plasma proteins.

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(Other reasons: it stores vitamins A, D, E, K and iron, and destroys old red blood cells.)

(x) How does the structure of a villus help in absorption of digested food? [3]

(1) Villi are finger-like projections that greatly increase the surface area of the small intestine for absorption.

(2) Each villus is covered by a thin simple columnar epithelium (a single cell layer), so digested food passes through it quickly by diffusion and active transport.

(3) The network of blood capillaries takes up glucose, amino acids, mineral salts and vitamins, and the lacteal takes up glycerol and fatty acids. Goblet cells make mucus that protects the surface.

Section C — Long Questions

Q4. Describe the structure and function of the large intestine. Also draw labelled diagram. [3 + 2]

Structure and function (3):

(1) The large intestine is a tube about 1.5 m long, leading from the small intestine to the anus. It is wider than the small intestine and is made up of the colon, the rectum and the anus.

(2) The colon starts at the caecum. The ileum enters it from the side, and the caecum has a pouch-like end with the appendix (about 10 cm long) attached at its base. The rest of the colon is the ascending colon (right), transverse colon (across), descending colon (left) and sigmoid colon, which joins the rectum.

(3) The rectum is a straight chamber (about 8 inches) that temporarily stores the faeces. The anus is the last part of the tract, a canal about 2 inches long, surrounded by sphincter muscles that allow control of stool.

(4) Function: water and some vitamins are absorbed into the blood. The semi-solid faeces are passed into the rectum by peristalsis and expelled through the anus at intervals (egestion or defecation).

Labelled diagram (2):

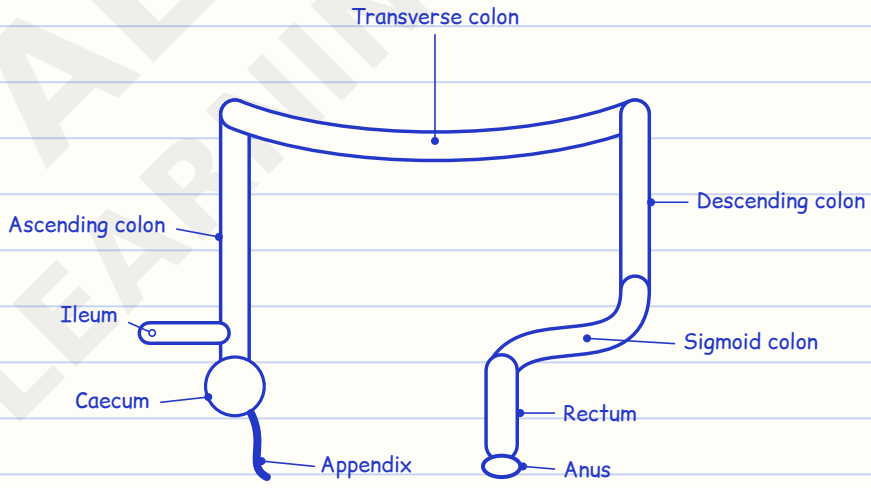


Fig: Large intestine

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Paper 7 — Model Paper

FBISE Model Paper · Curriculum 2022-23 · Inclusive Scheme of Studies 2024

Section A — MCQ

Q1 (viii). During a long-distance race, a runner's body needs a continuous supply of energy. Which part of the digestive system plays the most significant role in ensuring glucose is absorbed into the bloodstream to meet this energy demand? A) Liver B) Stomach C) Small intestine D) Large intestine

Ans: (C) Small intestine. [Starch is changed to glucose by amylase and maltase, and the villi of the small intestine absorb the glucose into the blood capillaries.]

Section B — Short Questions (Q2)

(i) Narrate the series of events that take place during swallowing of food. [3]

(1) The tongue presses upwards and back against the roof of the mouth and forces the bolus to the back of the mouth. This first part is voluntary.

(2) The soft palate closes the nasal cavity at the back.

(3) The larynx cartilage around the top of the trachea is pulled upwards, so the glottis (opening of the trachea) lies under the back of the tongue.

(4) The epiglottis, a flap of cartilage, covers the glottis and prevents food from entering the trachea.

(5) Once the food reaches the back of the mouth, swallowing becomes automatic (involuntary). The food is forced into and down the oesophagus by peristalsis.

(vi) (OR) Name and give roles of components of gastric juice which help in digestion of different materials. [1 + 2]

Names (1): the components of gastric juice are mucus, hydrochloric acid (HCl), pepsin (secreted as pepsinogen) and renin.

Roles (2):

(1) Mucus: forms a coating over the stomach and prevents digestion of the stomach wall by pepsin.

(2) HCl: stops the action of salivary amylase, converts pepsinogen into pepsin, provides the acidic medium for enzymes and kills many microorganisms.

(3) Pepsin: digests proteins into polypeptides and peptides.

(4) Renin: secreted only in infants; it helps in the digestion of milk protein.

Section C — Long Questions

Q4. Write about the structure of a villus. How they are involved in absorption of food in small intestine? [2 + 4]

Structure (2):

(1) Villi are tiny finger-like projections of the internal lining of the small intestine. Each villus is covered by simple columnar epithelium.

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(2) Each villus contains a network of blood capillaries and a lymph capillary called a lacteal. Goblet cells secrete mucus, and the intestinal crypts between the bases of the villi provide stem cells to renew the epithelium.

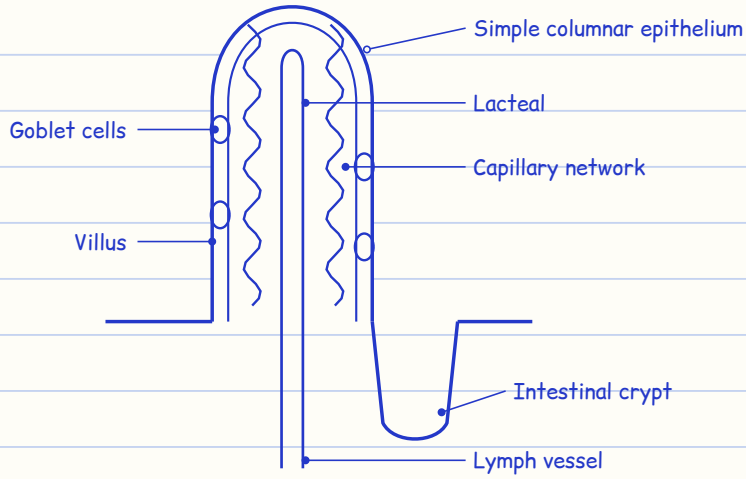


Fig: Structure of villus

Absorption (4):

(1) The villi greatly increase the surface area for absorption, and their thin single-cell epithelium lets digested food pass quickly.

(2) Simple sugars (glucose) and amino acids pass through the wall of the villus into the blood capillaries. Mineral salts and vitamins also enter the capillaries. Absorption occurs by diffusion and active transport.

(3) Glycerol and fatty acids are absorbed by the lacteal and are finally poured into the blood.

(4) The capillaries join to form veins, which unite into the hepatic portal vein. It carries all the blood from the intestine to the liver, which may store or change the digestion products. The blood then carries the food to all body cells, where it is assimilated.

— End of Solutions —

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