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FBISE 2025 Model Paper Pattern · Biology Chapter Quiz

Class 10 | Unit 1 : DIGESTIVE SYSTEM

ANSWER KEY (Total Marks: 25)

SECTION A (10 Marks)

Q1. Which statement best defines "digestion"?

Ans: (C) Breakdown of large food molecules into small soluble molecules with the help of enzymes. [Taking food in is ingestion, passage into the blood is absorption, and removal of waste is egestion.]

Q2. The uptake and use of digested food by body cells is called:

Ans: (A) Assimilation. [Absorption only moves food into the blood. Assimilation is its use by the cells.]

Q3. Which of the following is NOT a part of the alimentary canal?

Ans: (D) Pancreas. [The pancreas is an associated gland. Food never passes through it.]

Q4. The cardiac sphincter guards the opening between:

Ans: (B) Oesophagus and stomach. [The stomach-duodenum opening is guarded by the pyloric sphincter.]

Q5. Which type of tooth is mainly used to tear food?

Ans: (C) Canines. [Incisors cut, while premolars and molars chew and grind.]

Q6. Which two secretions are emptied into the duodenum?

Ans: (A) Bile and pancreatic juice. [Bile (from the gall bladder) and pancreatic juice empty into the duodenum.]

Q7. Which pair is MISMATCHED?

Ans: (D) Parotid gland – opens under the tongue. [The parotid gland is in front of the ears and opens near the upper molars.]

Q8. During swallowing, the soft palate:

Ans: (B) Closes the nasal cavity. [The soft palate closes the nasal cavity. The epiglottis covers the glottis.]

Q9. Which stage of swallowing is voluntary?

Ans: (A) Tongue pushing the bolus to the back of the mouth. [Swallowing begins voluntarily. After food reaches the back of the mouth it is automatic.]

Q10. In peristalsis, the bolus is pushed forward by:

Ans: (C) Contraction of circular muscles behind the bolus. [Circular muscles contract just behind the bolus and push it forward.]

Q11. Which enzyme-substrate pair is MISMATCHED?

Ans: (B) Maltase – lactose. [Maltase acts on maltose. Lactase acts on lactose.]

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Q12. Inactive pepsinogen is converted into active pepsin by:

Ans: (D) HCl. [HCl converts pepsinogen into pepsin.]

Scenario for MCQs 13–16: Three patients visit a clinic. Patient X has burning stomach pain; a scan shows an open sore in the stomach wall. He smokes and eats a lot of spicy food. Patient Y has a gallstone blocking the bile duct and passes fatty, pale stools. Patient Z passes hard stools only once in several days with abdominal pain; she eats very little fibre and drinks little water.

Q13. Patient X most likely suffers from:

Ans: (A) Gastric ulcer. [An open sore in the stomach wall is a gastric ulcer.]

Q14. Which advice would help to prevent the condition of Patient X?

Ans: (C) Stop smoking and avoid stress. [Smoking, acidity, spicy food and stress cause ulcers.]

Q15. Patient Y's condition mainly affects:

Ans: (B) Emulsification of fats. [Bile is blocked, so fats cannot be emulsified into small droplets.]

Q16. The condition of Patient Z occurs because:

Ans: (D) Faeces move too slowly and extra water is absorbed. [Slow movement lets extra water be absorbed, so the faeces become hard.]

Scenario for MCQs 17–20: The table shows the stages of protein digestion along the alimentary canal.

Region	Enzyme	Product
Stomach	P	Polypeptides and peptides
Duodenum	Q	Polypeptides
Ileum	R	Amino acids

Q17. Enzyme P, working in the stomach, is:

Ans: (A) Pepsin. [Pepsin digests proteins into polypeptides and peptides in the stomach.]

Q18. Enzyme Q is secreted in inactive form and is activated by:

Ans: (C) Enterokinase. [Enterokinase from the lining of the jejunum and ileum activates trypsinogen into trypsin.]

Q19. The amino acids formed in the ileum are absorbed into the:

Ans: (D) Blood capillaries of the villus. [Amino acids pass into the blood capillaries of the villus.]

Q20. Excess amino acids undergo deamination in the liver. The ammonia formed is converted into:

Ans: (B) Urea. [The liver removes the amino group (deamination). The ammonia formed is changed into urea.]

SECTION B (3 × 3 = 9 Marks)

Q1 Define digestion. Write two functions of HCl in the stomach. [1 + 2]

Definition: Digestion is the breakdown of large, insoluble food molecules into small, soluble molecules with the help of enzymes.

Functions of HCl (any two):

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(1) It stops the action of salivary amylase.

(2) It converts inactive pepsinogen into active pepsin.

(3) It provides the acidic medium suitable for the action of enzymes in the stomach.

(4) It kills many microorganisms.

OR

Define assimilation and egestion. Write the final product of starch digestion that is absorbed into the blood. [1 + 1 + 1]

Assimilation: the uptake and use of the absorbed food (glucose, amino acids and fats) by the body cells.

Egestion: the removal of undigested food from the body through the anus (defecation).

Final product: Glucose. Amylase changes starch into maltose, and maltase converts maltose into glucose, which is absorbed into the blood capillaries of the villi.

Q2 Differentiate between mechanical digestion and chemical digestion by giving THREE differences. [3]

(1) Mechanical digestion physically breaks food into smaller pieces; chemical digestion breaks large food molecules into small soluble molecules.

(2) Mechanical digestion needs no enzymes (it is done by teeth, tongue and churning of the stomach); chemical digestion is carried out by enzymes.

(3) In mechanical digestion no new substance is formed, only the size changes (e.g. chewing); in chemical digestion new simple substances are formed (e.g. starch into maltose by salivary amylase).

OR

Write the substrate and product of each enzyme: (a) Salivary amylase (b) Pancreatic lipase (c) Erepsin. [1 + 1 + 1]

(a) Salivary amylase: Substrate = starch; Product = maltose.

(b) Pancreatic lipase: Substrate = triglycerides (fats); Product = glycerol and fatty acids.

(c) Erepsin: Substrate = peptides; Product = amino acids.

Q3 Define peristalsis. Explain how circular and longitudinal muscles move the bolus forward. [1 + 2]

Definition: Peristalsis is the rhythmic wave of muscular contraction and relaxation in the wall of the alimentary canal that moves food through it.

Action: (1) Circular muscles contract just behind the bolus and push it forward.

(2) In the region ahead, longitudinal muscles contract, which shortens and widens the passage so the bolus can move into it.

(3) The wave of contraction passes along the canal and repeats, so the food moves on step by step.

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OR

Write the causes, symptoms and prevention of gastric ulcer. [1 + 1 + 1]

Gastric ulcer is an open sore in the wall of the stomach caused by gradual disintegration of the tissue.

Causes (1): acidity, smoking and bacterial infection.

Symptom (1): stomach pain is the main symptom.

Prevention (1): (a) stop smoking, (b) avoid spicy food and food containing acids, (c) avoid stress.

SECTION C (1 × 6 = 6 Marks)

Q4 Describe digestion in the stomach. Explain how bile and pancreatic juice help digestion in the small intestine. [3 + 3]

Digestion in the stomach (3):

(1) On the peristaltic reflex the cardiac sphincter relaxes and food enters the stomach. The food stimulates the gastric glands to secrete gastric juice containing mucus, HCl, pepsinogen and renin. Mucus coats the stomach wall and protects it from being digested by pepsin.

(2) HCl stops the action of salivary amylase, converts pepsinogen into pepsin, gives the acidic medium and kills microorganisms. Pepsin digests proteins into polypeptides and peptides. Renin (only in infants) helps digest milk protein.

(3) 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 passes into the duodenum.

Role of bile and pancreatic juice (3):

(1) Chyme stimulates the gall bladder to release bile and the pancreas to secrete pancreatic juice. These secretions are alkaline, so they neutralise the acidic chyme and give the medium in which pancreatic and intestinal enzymes work.

(2) Bile is made in the liver and stored in the gall bladder. It has no enzymes but emulsifies fats into small droplets. This gives a large surface area for the action of lipase.

(3) Pancreatic juice contains amylase (starch to maltose and glucose), lipase (triglycerides to glycerol and fatty acids) and trypsinogen. Enterokinase changes trypsinogen into trypsin, which digests proteins into polypeptides. Erepsin, maltase and lactase of the intestinal juice complete digestion in the ileum.

OR

Describe the structure of a villus. How is it involved in the absorption of food in the 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.

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 Answer Key —

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