

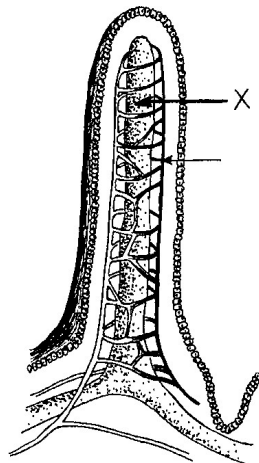
# Digestive System

## Part A – Multiple Choice

- Which of the following is **NOT** a digestive enzyme?
  - Pepsin.
  - Ptyalin.
  - Gastrin.
  - Trypsin.
- The presence of large numbers of mitochondria in the cells which line the small intestine allow it to
  - engulf fats.
  - digest proteins.
  - absorb glucose.
  - synthesize vitamins.
- The function of the gall bladder is to
  - store bile.
  - synthesize lipids.
  - produce enzymes.
  - stimulate the release of pancreatic juice.
- The bacterium *E. coli* is normally found in large numbers in
  - food.
  - feces.
  - bile salts.
  - stomach juices.
- Which of the following digestive enzymes is **NOT** correctly matched with its substrate?
  - Lipase – fat.
  - Pepsin – protein.
  - Trypsin – nucleic acid.
  - Salivary amylase – starch.
- Glucose is stored in the liver as
  - fat.
  - starch.
  - protein.
  - glycogen.
- The part of the digestive tract where starch first undergoes chemical digestion is the
  - mouth.
  - stomach.
  - small intestine.
  - large intestine.
- The release of insulin is *triggered* by
  - low levels of blood sugar.
  - high levels of blood sugar.
  - low amounts of sugar in one's diet.
  - high amounts of sugar in one's diet.
- Which of the following is absorbed into lacteals?
  - Glucose.
  - Fatty acids.
  - Nucleotides.
  - Amino acids.

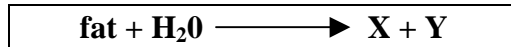
10. The absorption of digested food products occurs primarily in the
  - A. liver.
  - B. stomach.
  - C. large intestine.
  - D. small intestine.
  
11. Which structure is the appendix attached to?
  - A. The stomach.
  - B. The gall bladder.
  - C. The large intestine.
  - D. The small intestine.
  
12. In which combination of organs does the digestion of carbohydrates occur?
  - A. Mouth and large intestine.
  - B. Mouth and small intestine.
  - C. Mouth, stomach and pancreas.
  - D. Mouth, stomach, small intestine.
  
13. Which region has openings for both the trachea and esophagus?
  - A. Throat.
  - B. Pharynx.
  - C. Stomach.
  - D. Epiglottis.

**Use the following diagram to answer the next question.**



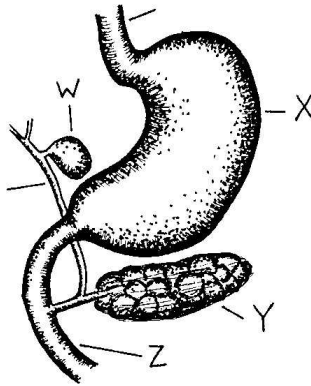
14. Which of the following will enter the structure labeled X?
  - A. Lipids.
  - B. Glucose.
  - C. Nucleotides.
  - D. Amino acids.
  
15. If pancreatic juice was added to a chopped up deluxe hamburger and allowed to soak for 24 hours, which of the following would **MOST** likely be present?
  - A. Monosaccharides and polypeptides.
  - B. Amino acids, glucose, and fatty acids.
  - C. Nucleotides, glucose and amino acids.
  - D. Fatty acids, polypeptides, glycerol and maltose.
  
16. Which of the following correctly matches a digestive enzyme with its source?
  - A. Pepsin - pancreas.
  - B. Bile - gall bladder.
  - C. Trypsin - stomach.
  - D. Amylase - pancreas.

17. Given the correct enzyme for the following reaction, product X could represent



- A. peptides.
- B. fatty acids.
- C. nucleotides.
- D. amino acids.

Use the following diagram to answer the next two questions.



18. Which organ releases an enzyme that digests fats?
- A. W
  - B. X
  - C. Y
  - D. Z
19. Which organ functions to store food, kill bacteria, and digest protein?
- A. W
  - B. X
  - C. Y
  - D. Z
20. Starting in the esophagus, how many sphincters will an indigestible fibre molecule pass through on its way to the small intestine?
- A. One.
  - B. Two.
  - C. Three.
  - D. Four.
21. One function of the liver is the production of
- A. urea.
  - B. lipase.
  - C. mucus.
  - D. hydrochloric acid.
22. The removal of a large section of the colon is likely to affect the
- A. release of bile.
  - B. digestion of fats.
  - C. absorption of glucose.
  - D. water balance in the body.
23. When salivary amylase enters the stomach, it becomes
- A. basic.
  - B. acidic.
  - C. buffered.
  - D. denatured.

24. A function of the cardiac sphincter is to prevent movement of acid chyme from the
- esophagus to the mouth.
  - stomach to the esophagus.
  - duodenum to the stomach.
  - colon to the small intestine.
25. Which of the following protects the stomach from hydrochloric acid?
- Bile.
  - Pepsin.
  - Mucus.
  - Bicarbonate ions.
26. Which of the following could be found within the walls of the stomach, but **NOT** the chamber of the stomach?
- HCl.
  - Pepsin.
  - Gastrin.
  - Trypsin.
27. Which of the following structures does **NOT** produce digestive enzymes?
- Stomach.
  - Pancreas.
  - Small intestine.
  - Large intestine.
28. The presence of food in the trachea indicates a malfunctioning
- pharynx.
  - epiglottis.
  - esophagus.
  - cardiac sphincter.
29. Which of the following pancreatic secretions doesn't enter the duodenum?
- Lipase.
  - Insulin.
  - Trypsin.
  - Bicarbonate ions.
30. Which enzymes are produced and secreted in an inactive form?
- Lipases.
  - Proteases.
  - Amylases.
  - Nucleases.
31. Pancreatic juices are
- alkaline (basic).
  - a good source of vitamins.
  - necessary for the release of insulin.
  - unnecessary for the digestion of fat.
32. A sampling of the material from one region of the digestive system was found to contain both maltase and peptidases. Which region was the sample taken from?
- Ileum.
  - Stomach.
  - Pancreas.
  - Duodenum.
33. In which set of digestive organs does physical digestion occur?
- Mouth and stomach.
  - Mouth and small intestine.
  - Stomach and small intestine.
  - Mouth, stomach and small intestine.

34. In how many of the structures listed below does peristalsis occur?

- Esophagus
- Stomach
- Small intestine
- Large intestine

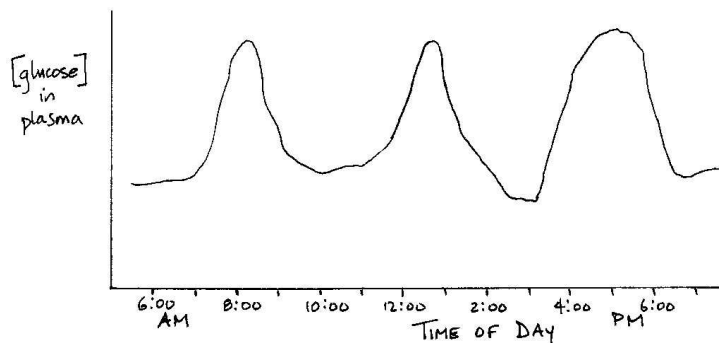
- A. One.
- B. Two.
- C. Three.
- D. Four.

35. Which of the following is the correct sequence of terms used to identify the food material as it passes along the digestive tract?

- A. Bolus, acidic chyme, feces, chyme.
- B. Chyme, acidic chyme, feces, bolus.
- C. Bolus, chyme, acidic chyme, feces.
- D. Bolus, acidic chyme, chyme, feces.

### Part B – Written Answers

1. Describe **TWO** ways that the small intestine is well specialized for **each** of the following functions:
  - a. Transport
  - b. Digestion
  - c. Absorption
2. Describe the role of bacteria in the colon.
3. The graph below represents the glucose level in the blood of a student when she eats a well-balanced breakfast at 7:00 AM and lunch at 12:00 PM and dinner at 5:00 PM. One the particular day when the glucose level was monitored, this student went to the gym for a workout after school.



Explain the changes that occur in blood glucose concentration at each of the following times:

- a. between 7:00 AM and 8:00 AM
  - b. between 1:00 PM and 2:00 PM
  - c. between 4:00 PM and 5:00 PM
4.
    - a. Name the substance that emulsifies fat in the digestive system.
    - b. Explain how emulsification assists in the chemical digestion of fat.
    - c. How would a person be affected if they were unable to store this substance?
  5.
    - a. Is digestion an intracellular process (occurring inside cells) or an extracellular process (occurring outside of cells)? Explain.
    - b. Where do nutrients actually enter the body? Explain.

6. Complete the following data table.

SUBSTANCE	SOURCE OF SUBSTANCE	SITE OF ACTIVITY	PRODUCT OF ACTIVITY
ptyalin	salivary glands		
pepsin		stomach	
glucagon			glucose
	pancreas		fatty acids and glycerol

7. Food material that is being digested experiences two large changes in pH as it passes through the digestive system. Identify these pH changes, what causes them and why each one exists.
8. Detail the sequence of steps in the physical and chemical digestion and absorption of a mouthful of pure protein as it travels through the digestive system.