

CHAPTER 48—DIGESTIVE AND EXCRETORY SYSTEMS

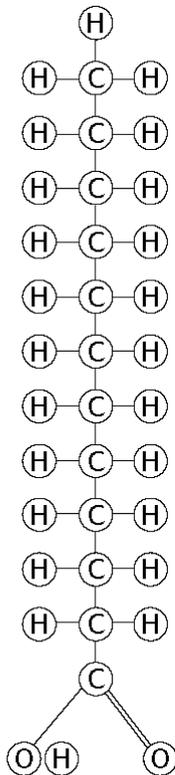
MULTIPLE CHOICE

1. Nutrients provide the body with the energy and materials it needs for
- growth.
 - maintenance.
 - repair.
 - All of the above

ANS: D DIF: 1 OBJ: 48-1.1

2. All essential amino acids
- must be obtained from the foods we eat.
 - are made in our body in sufficient quantities.
 - are found in gelatin.
 - None of the above

ANS: A DIF: 1 OBJ: 48-1.1



3. Refer to the illustration above. Most of the energy in the molecule shown is stored in the
- carbon-oxygen bonds.
 - carbon-hydrogen bonds.
 - oxygen-hydrogen bonds.
 - carbon-oxygen double bond.

ANS: B DIF: 1 OBJ: 48-1.1

4. Refer to the illustration above. The structure shown is most likely a portion of a
- a. fat molecule.
 - b. carbohydrate molecule.
 - c. protein molecule.
 - d. amino acid molecule.

ANS: A DIF: 1 OBJ: 48-1.1

5. Vitamin K
- a. is soluble in fat.
 - b. assists with blood clotting.
 - c. is found in green vegetables.
 - d. All of the above

ANS: D DIF: 1 OBJ: 48-1.4

6. Vitamins are organic compounds that
- a. help activate enzymes during chemical reactions.
 - b. provide energy for metabolism.
 - c. help form cell membranes.
 - d. are not obtained from food.

ANS: A DIF: 1 OBJ: 48-1.4

7. Excessive amounts of vitamins such as vitamins A, D, E, and K
- a. lead to excellent health.
 - b. can be harmful.
 - c. present no problem since they are not stored in the body.
 - d. prevent beriberi.

ANS: B DIF: 1 OBJ: 48-1.5

8. Brain cells and red blood cells receive most of their energy directly from
- a. proteins.
 - b. cellulose.
 - c. glucose.
 - d. deoxyribose.

ANS: C DIF: 1 OBJ: 48-1.1

9. Most of the body's energy needs should be supplied by dietary
- a. carbohydrates.
 - b. fats.
 - c. vitamins.
 - d. proteins.

ANS: A DIF: 1 OBJ: 48-1.2

10. The first portion of the small intestine is the
- a. colon.
 - b. esophagus.
 - c. duodenum.
 - d. rectum.

ANS: C DIF: 1 OBJ: 48-2.1

11. The pharynx is
- a. located in the colon.
 - b. located in the back of the throat.
 - c. also called the voice box.
 - d. None of the above

ANS: B DIF: 1 OBJ: 48-2.1

12. Which of the following provides a passage for both food and air?
 a. the esophagus
 b. the trachea
 c. the pharynx
 d. the duodenum

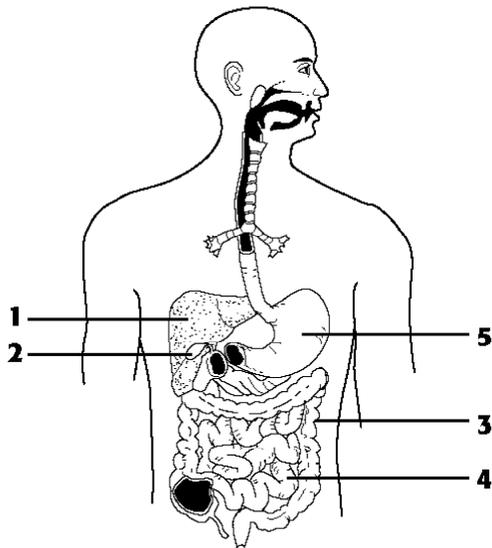
ANS: C DIF: 1 OBJ: 48-2.1

13. The function of the digestive system is to
 a. chemically break down food.
 b. mechanically break apart food.
 c. absorb nutrient materials.
 d. All of the above

ANS: D DIF: 1 OBJ: 48-2.1

14. small intestine : large intestine ::
 a. large intestine : small intestine
 b. stomach : large intestine
 c. esophagus : stomach
 d. small intestine : esophagus

ANS: C DIF: 2 OBJ: 48-2.1



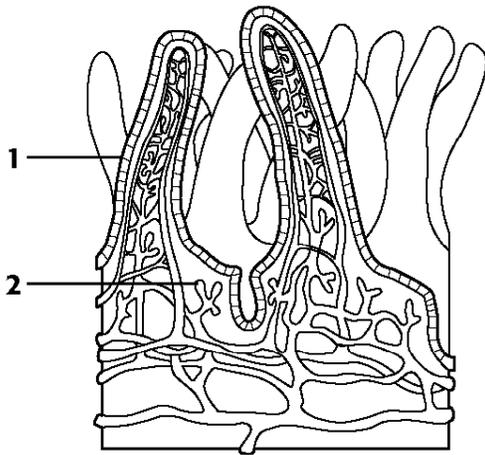
15. Refer to the illustration above. What is the name of structure 5?
 a. liver
 b. stomach
 c. duodenum
 d. ileum

ANS: B DIF: 1 OBJ: 48-2.1

16. Refer to the illustration above. Most of the products of digestion are absorbed into the circulatory system from which structure?
 a. 1
 b. 2
 c. 3
 d. 4

ANS: D DIF: 1 OBJ: 48-2.5

17. Chemical digestion occurs as a result of the action of
- hydrochloric acid.
 - pepsin.
 - saliva.
 - All of the above
- ANS: D DIF: 1 OBJ: 48-2.2
18. The wavelike contractions of muscle that move food through the digestive system are called
- peristalsis.
 - voluntary contractions.
 - mechanical digestion.
 - involuntary digestion.
- ANS: A DIF: 1 OBJ: 48-2.3
19. Enzymes in saliva begin the chemical digestion of
- fat.
 - protein.
 - carbohydrates.
 - vitamins.
- ANS: C DIF: 1 OBJ: 48-2.4
20. Pepsin and hydrochloric acid in the stomach begin the digestion of
- protein.
 - starch.
 - fats.
 - carbohydrates.
- ANS: A DIF: 1 OBJ: 48-2.4
21. Bile
- breaks down globules of fat into tiny droplets.
 - is stored in the liver.
 - is produced by the gall bladder.
 - All of the above
- ANS: A DIF: 1 OBJ: 48-2.3
22. Fat molecules are broken down into fatty acids by
- emulsifiers.
 - bile.
 - sphincters.
 - enzymes.
- ANS: D DIF: 1 OBJ: 48-2.4
23. pancreas : enzymes for small intestine ::
- stomach : saliva
 - stomach : proteins from amino acids
 - liver : bile
 - liver : hydrochloric acid
- ANS: C DIF: 2 OBJ: 48-2.4



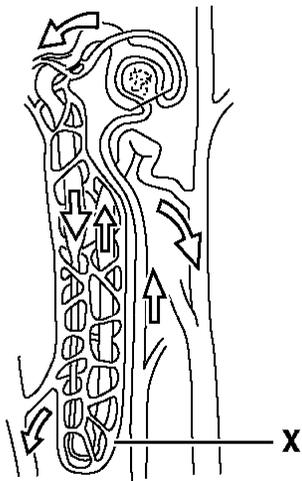
24. Refer to the illustration above. Structure 1 is a(n)
- | | |
|-------------|-------------|
| a. villus. | c. ureter. |
| b. nephron. | d. urethra. |
- ANS: A DIF: 1 OBJ: 48-2.5
25. Refer to the illustration above. This structure is found in the
- | | |
|---------------|---------------------|
| a. kidney. | c. small intestine. |
| b. esophagus. | d. tongue. |
- ANS: C DIF: 1 OBJ: 48-2.5
26. Refer to the illustration above. This structure allows for an increase in
- | | |
|------------------------------|---------------------|
| a. nutrient absorption area. | c. acid production. |
| b. mechanical digestion. | d. bile production. |
- ANS: A DIF: 1 OBJ: 48-2.5
27. Refer to the illustration above. Structure 2 is
- | |
|--|
| a. a passageway for bile to flow into the stomach. |
| b. a capillary. |
| c. found only in the duodenum. |
| d. a nephron. |
- ANS: B DIF: 1 OBJ: 48-2.5
28. The villi of the small intestine allow for an increase in the rate of
- | | |
|-------------------------|---------------------|
| a. nutrient absorption. | c. acid production. |
| b. cellulose digestion. | d. bile production. |
- ANS: A DIF: 1 OBJ: 48-2.5
29. Urea is formed in the
- | | |
|-----------|-------------|
| a. cells. | c. kidneys. |
| b. lungs. | d. liver. |
- ANS: D DIF: 1 OBJ: 48-3.1

30. The kidneys play a major role in maintaining
- the proper breathing rate.
 - the proper glucose levels in the blood.
 - homeostasis by removing urea, water, and other wastes from the blood.
 - the concentration of digestive enzymes in the blood.

ANS: C DIF: 1 OBJ: 48-3.1

31. The basic functional unit of the kidney is the
- villus.
 - nephron.
 - ureter.
 - urethra.

ANS: B DIF: 1 OBJ: 48-3.2



32. Refer to the illustration above. The structure shown in the diagram is a(n)
- villus.
 - nephron.
 - ureter.
 - urethra.

ANS: B DIF: 1 OBJ: 48-3.3

33. Refer to the illustration above. At the location labeled “X,”
- filtration is taking place.
 - water and solutes are moving back into the blood.
 - red blood cells are moving out of the blood.
 - red blood cells are forced back into the blood.

ANS: A DIF: 1 OBJ: 48-3.3

34. Refer to the illustration above. The structure shown in the diagram is the basic unit of the
- esophagus.
 - pancreas.
 - kidney.
 - liver.

ANS: C DIF: 1 OBJ: 48-3.3

35. The filtrate removed from the blood by the kidneys might contain
- salts, amino acids, glucose, and urea.
 - ammonia, red blood cells, and minerals.
 - fat, urea, and water.
 - salts, urea, and plasma.

ANS: A DIF: 1 OBJ: 48-3.4

36. Urine, when compared with the initial filtrate, contains
- more glucose.
 - less water, fewer minerals, and more urea.
 - decomposed red blood cells.
 - concentrated amino acids.

ANS: B DIF: 1 OBJ: 48-3.4

37. Ammonia is converted to urea because
- urea is less toxic to the body.
 - urea can be converted to a nutrient.
 - the nitrogenous wastes in urea can be recycled and do not need to be excreted.
 - All of the above

ANS: A DIF: 1 OBJ: 48-3.1

38. The first stage of urine formation is called
- filtration.
 - bladder inflation.
 - reabsorption.
 - nephrosis.

ANS: A DIF: 1 OBJ: 48-3.4

39. Which of the following filtrates is *not* reabsorbed in significant quantities back into the bloodstream by the nephrons?
- glucose
 - ions
 - urea
 - water

ANS: C DIF: 1 OBJ: 48-3.4

40. Urine leaves the body through the
- ureter.
 - urethra.
 - bladder.
 - intestine.

ANS: B DIF: 1 OBJ: 48-3.5

41. ureter : urinary bladder ::
- urinary bladder : ureter
 - urethra : urinary bladder
 - urinary bladder : urethra
 - Loop of Henle : vena cava

ANS: C DIF: 2 OBJ: 48-3.5

COMPLETION

1. The body most easily uses the energy provided by _____.

ANS: carbohydrates

DIF: 1 OBJ: 48-1.1

2. The major building blocks of body tissue are supplied by foods containing _____.

ANS: protein

DIF: 1 OBJ: 48-1.1

3. The amino acids that humans must obtain from food are called _____ amino acids.

ANS: essential

DIF: 1 OBJ: 48-1.1

4. The mouth, esophagus, stomach, small intestine, and large intestine are the main organs of the _____ system.

ANS: digestive

DIF: 1 OBJ: 48-2.1

5. The large intestine is also called the _____.

ANS: colon

DIF: 1 OBJ: 48-2.1

6. Digestion is completed in the _____, where most nutrients are absorbed.

ANS: small intestine

DIF: 1 OBJ: 48-2.1

7. The semisolid mixture of food, acid, and enzymes in the stomach is called _____.

ANS: chyme

DIF: 1 OBJ: 48-2.2

8. The _____ sends enzymes through a duct into the first part of the small intestine.

ANS: pancreas

DIF: 1 OBJ: 48-2.4

9. When digestive enzymes eat through part of the stomach lining, they cause a(n) _____.

ANS: ulcer

DIF: 1 OBJ: 48-2.2

10. Hydrochloric acid is secreted by cells in the _____ found on the stomach's inner wall.

ANS: gastric pits

DIF: 1 OBJ: 48-2.2

11. Pepsin and hydrochloric acid in the stomach begin the digestion of _____.

ANS: proteins

DIF: 1 OBJ: 48-2.4

12. Each kidney contains over 1 million functional units called _____.

ANS: nephrons

DIF: 1 OBJ: 48-3.2

13. The kidneys play a major role in maintaining _____.

ANS: homeostasis

DIF: 1 OBJ: 48-3.1

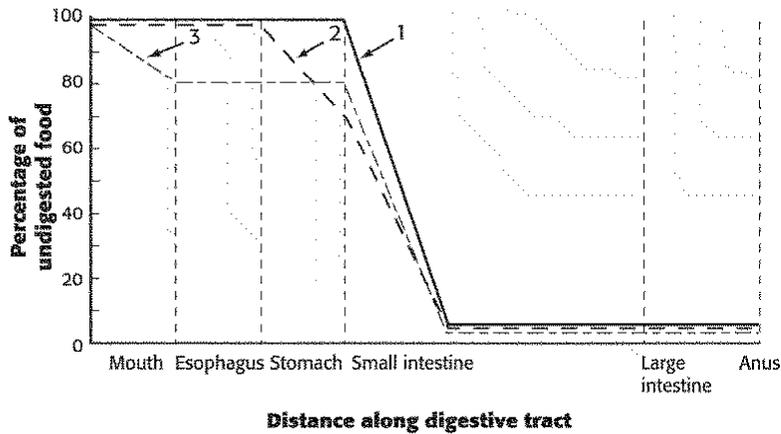
14. Urine produced in the kidneys passes into the bladder through tubes called _____.

ANS: ureters

DIF: 1 OBJ: 48-3.5

PROBLEM

1.



(Note: Values are approximate.)

The graph above shows the progress of digestion as carbohydrates, fats, and proteins pass through the human digestive tract. The horizontal axis indicates the relative distance along the digestive tract, from the mouth to the anus. The vertical axis indicates the percentage of undigested food remaining as the food moves through the digestive tract. The percentages of undigested carbohydrate, fat, and protein are shown separately, but they are identified only as 1, 2, and 3. Identify which of the graph lines shows carbohydrate digestion, which shows fat digestion, and which shows protein digestion. Write your answer in the space below.

ANS:

1 is fat, 2 is protein, and 3 is carbohydrate.

DIF: 3

OBJ: 48-2.4

2. The table below shows the composition of three different body fluids taken from a person. These fluids are identified as fluids A, B, and C. A number of substances are listed in the far left column of the table. The presence of one of these substances in a fluid is indicated by a “+” in the appropriate column. The absence of one of these substances from a fluid is indicated by a “-.”

Substance	Fluid A	Fluid B	Fluid C
Water	+	+	+
Blood cells	-	-	+
Proteins	-	-	+
Hormones	-	-	+
Amino acids	+	-	+
Urea	+	+	+
Glucose	+	-	+
Sodium	+	+	+
Other ions	+	+	+

Write your answers to the following in the spaces below.

- Which fluid, A, B, or C, is blood? Justify your choice.
- Which fluid, A, B, or C, is filtrate from nephrons of the kidney? Justify your choice.
- Which fluid, A, B, or C, is urine? Justify your choice.
- Which fluid, A, B, or C, would you expect to be the most concentrated (have the least amount of water in a given volume)?

ANS:

- C must be blood because it is the only one of the fluids that has blood cells in it.
- A must be filtrate in the nephrons because it contains glucose and amino acids, which are reabsorbed from the filtrate before urine leaves the body. A could not be blood because it does not contain blood cells.
- B must be urine because it contains only water, urea, sodium, and other ions. Both blood and nephron filtrate would contain additional substances.
- B

DIF: 3

OBJ: 48-3.4

ESSAY

- A vegan consumes no meat or other foods derived from animals, such as eggs or milk. What dietary problems might a vegan encounter? Write your answer in the space below.

ANS:

Individual plant foods may not contain sufficient amounts of all the essential amino acids. Vegans must carefully plan their diet so that plant foods lacking or low in some amino acids are eaten with other plant foods that are high in those amino acids. A vegan who simply abstains from all animal-derived foods may show symptoms of vitamin B₁₂ deficiency.

DIF: 2

OBJ: 48-1.3

2. Describe the chemical phase of digestion that occurs in the mouth. Write your answer in the space below.

ANS:

In the mouth, salivary glands release saliva, which is a mixture of water, mucus, and the enzyme salivary amylase. The salivary amylase begins the chemical digestion of carbohydrates by breaking down some starch into maltose.

DIF: 1 OBJ: 48-2.4

3. The structure of proteins makes it difficult for the body to digest them. How does the body solve the problem of digesting proteins? Write your answer in the space below.

ANS:

In the stomach, pepsin, a digestive enzyme, splits complex protein molecules into shorter chains of amino acids called peptides. Then, glands in the small intestine release enzymes that complete the digestion by breaking down peptides into amino acids.

DIF: 1 OBJ: 48-2.2

4. Identify the major wastes excreted by humans, and briefly describe how each is eliminated from the body. Write your answer in the space below.

ANS:

The major waste products excreted by humans are carbon dioxide, nitrogen wastes (urea), salts, and water. Carbon dioxide and some water are excreted by the lungs during exhalation. The kidneys remove water and urea (and some salts) from the blood to form urine, which is voided from the body through the urethra. The skin excretes water, salts, and small amounts of nitrogen wastes in sweat.

DIF: 1 OBJ: 48-3.1

5. Explain how the kidneys play a role in maintaining homeostasis in the body. Write your answer in the space below.

ANS:

The kidneys regulate the amounts of substances like salts, minerals, and other chemicals that are retained in the blood or excreted in the urine. In addition, the kidneys regulate the concentration of substances in the blood by adjusting the total amount of water in the body to keep the concentration nearly constant. Kidneys also remove urea and other waste products from the body.

DIF: 1 OBJ: 48-3.4