Chapter 2 – Digestion and Absorption

Multiple Choice

1. Another name for the digestive tract is the:
   a. urinary tract.
   b. exocrine system.
   c. gastrointestinal system.
   d. muscular system.

2. The digestive tract begins at the ____ and ends at the ____.
   a. stomach; large intestine
   b. pharynx; rectum
   c. lower esophageal sphincter; rectum
   d. mouth; anus

3. A bolus is a(n):
   a. sphincter muscle separating the stomach from the small intestine.
   b. portion of food swallowed at one time.
   c. enzyme that hydrolyzes starch.
   d. portion of partially digested food expelled by the stomach into the duodenum.

4. The _____ is formed in the mouth.
   a. bile
   b. bolus
   c. chyme
   d. villus

5. The _____ prevents food from entering the lungs.
   a. lower esophageal sphincter
   b. pharynx
   c. ileocecal valve
   d. epiglottis

6. The stomach empties into the:
   a. ileum.
   b. cecum.
   c. jejunum.
   d. duodenum.

7. Chyme is:
   a. a semiliquid mass of partially digested food.
   b. a portion of food swallowed at one time.
   c. an enzyme in the stomach needed for the digestion of protein.
   d. an esophageal secretion.

8. Two organs that secrete digestive juices into the small intestine are the _____ and _____.
   a. gallbladder; pancreas
   b. pancreas; liver
   c. gallbladder; liver
   d. duodenum; pancreas

9. The movement of chyme from the stomach into the small intestine is regulated by the:
   a. pancreas.
   b. pyloric sphincter.
   c. ileocecal valve.
   d. duodenum.

10. Immediately before passing into the large intestine, the food mass must pass though the:
    a. pyloric sphincter.
    b. lower esophageal sphincter.
    c. ileocecal valve.
    d. bolus.

11. *Peristalsis* is a term that refers to the:
    a. circulation of blood in the blood vessels.
    b. absorption of nutrients in the intestines.
    c. mixing and moving of food through the lymphatic system.
    d. last phase of digestion.
    e. action of the involuntary muscles of the digestive tract.

12. Involuntary muscle contractions move food through the intestinal tract. The movement that forces the contents back a few inches before pushing it forward again is called:
    a. segmentation.
    b. rotation.
    c. peristalsis.
    d. liquefaction.

13. Enzymes:
    a. facilitate chemical reactions.
    b. draw water into the small intestine.
    c. are present in all parts of the GI tract.
    d. encourage bacterial growth.

14. Which enzyme breaks down starch in the mouth?
    a. lingual protease
    b. lipase
    c. salivary amylase
    d. gastric protease
    e. secretin

15. Saliva contains an enzyme that digests:
    a. proteins.
    b. minerals.
    c. starches.
    d. vitamins.
    e. fiber.

16. Which of the following is not a component of gastric juice?
    a. water
    b. enzymes
    c. chylomicrons
    d. hydrochloric acid

17. The normal pH of the stomach is:
    a. very acidic.
    b. slightly acidic.
    c. neutral.
    d. slightly alkaline.
    e. strongly alkaline.

18. Which of the following organs does not contribute juices during digestion?
    a. salivary glands
    b. small intestine
    c. pancreas
    d. esophagus

19. The function of mucus in the stomach is to:
    a. neutralize stomach acid.
    b. activate pepsinogen to pepsin.
    c. protect stomach cells from gastric juices.
    d. emulsify fats.
    e. collect bacteria.

20. The major digestive work in the stomach is the initial breakdown of:
    a. starch.
    b. proteins.
    c. fat.
    d. vitamins.

21. In addition to hydrochloric acid, the stomach cells also secrete:
    a. mucus.
    b. bile.
    c. amylase.
    d. lipoproteins.
    e. cholesterol.

22. The major digestive enzyme secreted by the stomach is:
    a. amylase.
    b. lipase.
    c. pepsin.
    d. disaccharidase.

23. Which nutrients are digested in the small intestine?
    a. carbohydrate, fat, and protein
    b. fat, water, and fiber
    c. protein, vitamins, and fiber
    d. water, fiber, and minerals

24. The digestion of proteins begins in the _____ and ends in the _____.
    a. stomach; pancreas
    b. pancreas; small intestine
    c. stomach; small intestine
    d. small intestine; liver

25. Which of the following organs is the primary source of digestive enzymes?
    a. pancreas
    b. gallbladder
    c. stomach
    d. liver

26. After the pancreatic juices have mixed with chyme in the intestine, the resulting mixture is:
    a. very acidic.
    b. slightly acidic.
    c. strongly alkaline.
    d. slightly alkaline.

27. The liver:
    a. reabsorbs water and salts.
    b. secretes bile.
    c. churns food to chyme.
    d. performs enzymatic digestion.
    e. stores bile.

28. The main function of bile is to:
    a. emulsify fats.
    b. stimulate the activity of protein digestive enzymes.
    c. neutralize the intestinal contents.
    d. decrease the acidity of the contents of the stomach.

29. If the gallbladder becomes diseased, the digestion of _____ can become compromised.
    a. fat
    b. protein
    c. carbohydrate
    d. fiber

30. The gallbladder:
    a. reabsorbs water and salts.
    b. churns food to chyme.
    c. performs enzymatic digestion.
    d. stores bile.

31. The emulsification of fat requires:
    a. bile.
    b. enzymes.
    c. prostaglandins.
    d. intestinal flora.

32. Which of the following contains no digestive enzymes?
    a. saliva
    b. gastric juice
    c. intestinal juice
    d. bile

33. Which of the following does not secrete digestive juices?
    a. stomach
    b. pancreas
    c. salivary glands
    d. large intestine

34. Which of the following nutrients takes longest to digest?
    a. fat
    b. sugar
    c. vitamin C
    d. iron
    e. glucose

35. Fats present in the GI tract:
    a. slow down the process of digestion and absorption.
    b. cause difficulty in digestion.
    c. stimulate and hasten digestion and absorption.
    d. are carriers of thiamin, riboflavin, and niacin.

36. Which of the following foods would take the most time to digest?
    a. a piece of toast with strawberry jam
    b. a grilled steak
    c. a green salad with low-fat salad dressing
    d. a cup of green beans

37. Which of these foods would be digested most quickly?
    a. sugar cookies
    b. peanut butter sandwich and milk
    c. stew and cornbread
    d. hamburger, french fries, and milkshake

38. Which of the following foods would be digested most rapidly?
    a. a scoop of lemon sherbet
    b. an apple
    c. a baked potato with sour cream
    d. a piece of cheese on a cracker

39. Which nutrients must be broken down in order to be absorbed?
    a. vitamins, minerals, water
    b. carbohydrate, vitamins, minerals
    c. fat, protein, minerals
    d. carbohydrate, protein, fat

40. Bacteria in the GI tract perform all of the following functions except:
    a. producing biotin.
    b. protecting people from infection.
    c. producing vitamin K.
    d. producing bile.

41. Fiber functions to:
    a. aid in the absorption of vitamins.
    b. produce GI bacteria.
    c. stimulate the GI tract muscles.
    d. stimulate the absorption of nutrients.

42. A benefit of fiber is that it:
    a. promotes mineral absorption.
    b. aids in keeping stools soft.
    c. prevents diarrhea.
    d. keeps individual foods from getting mixed together.

43. Once the digestive process is complete, the colon retrieves materials that the body must recycle. These materials are:
    a. water and dissolved salts.
    b. iron and water.
    c. protein and sodium.
    d. water and fiber.

44. One of the functions of the colon is to absorb:
    a. salts.
    b. vitamins.
    c. sugars.
    d. fiber.

45. The primary site of nutrient absorption is the:
    a. stomach.
    b. pancreas.
    c. small intestine.
    d. large intestine.

46. Villi are part of the structure of the:
    a. esophagus.
    b. stomach.
    c. small intestine.
    d. large intestine.

47. The microscopic hairs that cover the surface of each cell lining the small intestine are called:
    a. intestinal folds.
    b. villi.
    c. microvilli.
    d. lymphatics.

48. Which of the following nutrients is/are absorbed into the lymphatic system?
    a. fat-soluble vitamins
    b. water
    c. amino acids
    d. glucose

49. After absorption, the water-soluble nutrients are released directly into the:
    a. bloodstream.
    b. kidneys.
    c. liver.
    d. lymph.

50. After absorption, the larger fats and fat-soluble vitamins are first released into the _____ transport system.
    a. excretory
    b. mesentery
    c. vascular
    d. lymphatic

51. After digestion, lipids are packaged for transport as lipoproteins known as:
    a. HDL.
    b. VLDL.
    c. LDL.
    d. chylomicrons.

52. Which of the following is not part of the structure of a chylomicron?
    a. phospholipid
    b. protein
    c. triglyceride
    d. water-soluble vitamins

53. The lymphatic system:
    a. contains fluid with the same composition as blood.
    b. eventually drains into the blood circulatory system.
    c. carries chylomicrons to the intestines.
    d. is where metabolism of nutrients takes place.

54. When nutrients enter the blood vessels from the small intestine, they are first transported to the:
    a. kidney.
    b. liver.
    c. cells throughout the body.
    d. thoracic duct.

55. Which of the following is the body's major metabolic organ?
    a. pancreas
    b. small intestine
    c. gallbladder
    d. liver

56. Elevated LDL concentrations are associated with a high risk of heart disease because they:
    a. transport cholesterol and triglycerides from the liver to the tissues.
    b. carry excessive amounts of fat that is deposited around the heart.
    c. encourage high levels of iron in the blood.
    d. take excess cholesterol back to the liver, which increases the production of cholesterol.

57. Elevated HDL concentrations are associated with a low risk of heart disease because they:
    a. transport newly absorbed lipids from intestinal cells to the rest of the body.
    b. carry cholesterol and triglycerides from the liver to the rest of the body.
    c. carry lipids around in the blood more often than LDL.
    d. take excess cholesterol and phospholipids from the tissues and return them to the liver.

58. The lipoprotein that contains the greatest proportion of triglyceride is the:
    a. HDL.
    b. LDL.
    c. VLDL.
    d. chylomicron.

59. Which of the following factors is not required for optimal health and performance of the digestive system?
    a. adequate sleep
    b. enzyme supplements
    c. mental state
    d. nutrition

60. Which of the following will cause a foodborne infection?
    a. foods containing toxin-producing microbes
    b. *Clostridium botulinum*
    c. *Campylobacter jejuni*
    d. *Staphylococcus aureus*

61. To prevent bacterial growth when holding cooked foods, they should be kept at _____° F or higher until served.
    a. 40
    b. 140
    c. 165
    d. 200

62. To prevent foodborne illnesses:
    a. Fresh produce should be washed before it is eaten.
    b. Only new sponges and towels should be used in the kitchen.
    c. Leftovers can safely be covered and left at room temperature until the next meal.
    d. Meats should be marinated at room temperature.

63. Cold food should be stored at _____.
    a. 40° F or colder
    b. 55° F or colder
    c. 80° F or colder
    d. 140° F or colder

64. Leftovers should be used within _____ days.
    a. 5-7
    b. 3-4
    c. 2-3
    d. 1-2

Essay

1. Outline and trace the path food follows through the digestive tract from one end to the other.
2. Describe the role of the stomach in the process of digestion.
3. Should antacids be taken to decrease the strong acidity of the stomach? Explain your answer.
4. Explain what determines the rate of digestion of the energy nutrients.
5. Explain the benefits of intestinal microflora to health.
6. Describe the difference between low-density lipoproteins (LDL) and high-density lipoproteins (HDL). What is the relationship between blood levels of these lipoproteins and risk of heart disease?

Matching

1. anus
2. appendix
3. duodenum
4. epiglottis
5. esophagus
6. gallbladder
7. ileocecal valve
8. ileum
9. jejunum
10. large intestine
11. lower esophageal sphincter
12. mouth
13. pancreas
14. pharynx
15. pyloric sphincter
16. rectum
17. small intestine
18. trachea

a. the oral cavity containing the tongue and teeth.
b. the passageway leading from the nose and mouth to the larynx and esophagus, respectively.
c. a cartilage structure in the throat that prevents fluid or food from entering the trachea when a person swallows.
d. the passageway from the mouth and nose to the lungs.
e. the conduit from the mouth to the stomach.
f. the sphincter muscle at the junction between the esophagus and the stomach.
g. the sphincter muscle separating the stomach from the small intestine.
h. the organ that stores and concentrates bile.
i. a gland that secretes enzymes and digestive juices into the duodenum.
j. a 10-foot length of small-diameter (1-inch) intestine that is the major site of digestion of food and absorption of nutrients.
k. the top portion of the small intestine.
l. the first two-fifths of the small intestine beyond the duodenum.
m. the last segment of the small intestine.
n. the sphincter muscle separating the small and large intestines.
o. the last portion of the intestine, which absorbs water.
p. a narrow blind sac extending from the beginning of the large intestine; stores lymphocytes.
q. the muscular terminal part of the GI tract extending from the sigmoid colon to the anus.
r. the terminal sphincter muscle of the GI tract.

19. chylomicrons
20. high-density lipoproteins
21. lipoprotein
22. low-density lipoproteins
23. triglycerides
24. very-low-density lipoproteins

a. class of lipids composed of glycerol with three fatty acids attached.
b. the lipoproteins that transport lipids from the intestinal cells into the body.
c. a cluster of lipids associated with proteins that serves as a transport vehicle for lipids in the lymph and blood.
d. the type of lipoproteins made primarily by liver cells to transport lipids to various tissues in the body; composed primarily of triglycerides.
e. the type of lipoproteins derived from VLDL as cells remove triglycerides from them; composed primarily of cholesterol.
f. the type of lipoproteins that transport cholesterol back to the liver from peripheral cells; composed primarily of protein.

Answer Key (ANS = answer, DIF = level of difficulty, REF = page reference, TOP = chapter section)

Multiple Choice

1.	ANS: c	DIF: Knowledge-level	REF: 38	TOP: 2.1
2.	ANS: d	DIF: Knowledge-level	REF: 38	TOP: 2.1
3.	ANS: b	DIF: Knowledge-level	REF: 39	TOP: 2.1
4.	ANS: b	DIF: Knowledge-level	REF: 39	TOP: 2.1
5.	ANS: d	DIF: Knowledge-level	REF: 39	TOP: 2.1
6.	ANS: d	DIF: Knowledge-level	REF: 40	TOP: 2.1
7.	ANS: a	DIF: Knowledge-level	REF: 40	TOP: 2.1
8.	ANS: a	DIF: Knowledge-level	REF: 40	TOP: 2.1
9.	ANS: b	DIF: Knowledge-level	REF: 40	TOP: 2.1
10.	ANS: c	DIF: Knowledge-level	REF: 40	TOP: 2.1
11.	ANS: e	DIF: Knowledge-level	REF: 40	TOP: 2.1
12.	ANS: a	DIF: Knowledge-level	REF: 41	TOP: 2.1
13.	ANS: a	DIF: Knowledge-level	REF: 43	TOP: 2.2
14.	ANS: c	DIF: Knowledge-level	REF: 43	TOP: 2.2
15.	ANS: c	DIF: Knowledge-level	REF: 43	TOP: 2.2
16.	ANS: c	DIF: Knowledge-level	REF: 43	TOP: 2.2
17.	ANS: a	DIF: Knowledge-level	REF: 43	TOP: 2.2
18.	ANS: d	DIF: Knowledge-level	REF: 43	TOP: 2.2
19.	ANS: c	DIF: Knowledge-level	REF: 44	TOP: 2.2
20.	ANS: b	DIF: Knowledge-level	REF: 44	TOP: 2.2
21.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
22.	ANS: c	DIF: Knowledge-level	REF: 44	TOP: 2.2
23.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
24.	ANS: c	DIF: Knowledge-level	REF: 44	TOP: 2.2
25.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
26.	ANS: d	DIF: Knowledge-level	REF: 44	TOP: 2.2
27.	ANS: b	DIF: Knowledge-level	REF: 44	TOP: 2.2
28.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
29.	ANS: a	DIF: Application-level	REF: 44	TOP: 2.2
30.	ANS: d	DIF: Knowledge-level	REF: 44	TOP: 2.2
31.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
32.	ANS: d	DIF: Knowledge-level	REF: 43-44	TOP: 2.2
33.	ANS: d	DIF: Knowledge-level	REF: 43	TOP: 2.2
34.	ANS: a	DIF: Application-level	REF: 45	TOP: 2.2
35.	ANS: a	DIF: Knowledge-level	REF: 45	TOP: 2.2
36.	ANS: b	DIF: Application-level	REF: 45	TOP: 2.2
37.	ANS: a	DIF: Application-level	REF: 45	TOP: 2.2
38.	ANS: a	DIF: Application-level	REF: 45	TOP: 2.2
39.	ANS: d	DIF: Knowledge-level	REF: 45	TOP: 2.2
40.	ANS: d	DIF: Knowledge-level	REF: 45	TOP: 2.2
41.	ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.2
42.	ANS: b	DIF: Knowledge-level	REF: 45	TOP: 2.2
43.	ANS: a	DIF: Knowledge-level	REF: 45	TOP: 2.2
44.	ANS: a	DIF: Knowledge-level	REF: 45	TOP: 2.2
45.	ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.3

46.	ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.3
47.	ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.3
48.	ANS: a	DIF: Knowledge-level	REF: 47	TOP: 2.3
49.	ANS: a	DIF: Knowledge-level	REF: 47	TOP: 2.3
50.	ANS: d	DIF: Knowledge-level	REF: 47	TOP: 2.3
51.	ANS: d	DIF: Knowledge-level	REF: 47	TOP: 2.3
52.	ANS: d	DIF: Knowledge-level	REF: 47	TOP: 2.3
53.	ANS: b	DIF: Knowledge-level	REF: 48	TOP: 2.4
54.	ANS: b	DIF: Knowledge-level	REF: 48	TOP: 2.4
55.	ANS: d	DIF: Knowledge-level	REF: 48	TOP: 2.4
56.	ANS: a	DIF: Knowledge-level	REF: 48-49	TOP: 2.4
57.	ANS: d	DIF: Application-level	REF: 48-49	TOP: 2.4
58.	ANS: d	DIF: Knowledge-level	REF: 50	TOP: 2.4
59.	ANS: b	DIF: Knowledge-level	REF: 51	TOP: 2.5
60.	ANS: c	DIF: Knowledge-level	REF: 53-55	TOP: NIP 2
61.	ANS: b	DIF: Knowledge-level	REF: 58	TOP: NIP 2
62.	ANS: a	DIF: Application-level	REF: 58	TOP: NIP 2
63.	ANS: a	DIF: Knowledge-level	REF: 58	TOP: NIP 2
64.	ANS: b	DIF: Knowledge-level	REF: 58	TOP: NIP 2

Essay

1.	DIF: Knowledge-level	REF: 38-40	TOP: 2.1
2.	DIF: Knowledge-level	REF: 41-42|43-44	TOP: 2.1|2.2
3.	DIF: Application-level	REF: 43-44	TOP: 2.2
4.	DIF: Knowledge-level	REF: 45	TOP: 2.2
5.	DIF: Knowledge-level	REF: 45	TOP: 2.2
6.	DIF: Knowledge-level	REF: 48-50	TOP: 2.4

Matching

1.	ANS: r	DIF: Knowledge-level	REF: 38	TOP: 2.1
2.	ANS: p	DIF: Knowledge-level	REF: 38	TOP: 2.1
3.	ANS: k	DIF: Knowledge-level	REF: 38	TOP: 2.1
4.	ANS: c	DIF: Knowledge-level	REF: 38	TOP: 2.1
5.	ANS: e	DIF: Knowledge-level	REF: 38	TOP: 2.1
6.	ANS: h	DIF: Knowledge-level	REF: 38	TOP: 2.1
7.	ANS: n	DIF: Knowledge-level	REF: 38	TOP: 2.1
8.	ANS: m	DIF: Knowledge-level	REF: 38	TOP: 2.1
9.	ANS: l	DIF: Knowledge-level	REF: 38	TOP: 2.1
10.	ANS: o	DIF: Knowledge-level	REF: 38	TOP: 2.1
11.	ANS: f	DIF: Knowledge-level	REF: 38	TOP: 2.1
12.	ANS: a	DIF: Knowledge-level	REF: 38	TOP: 2.1
13.	ANS: i	DIF: Knowledge-level	REF: 38	TOP: 2.1
14.	ANS: b	DIF: Knowledge-level	REF: 38	TOP: 2.1
15.	ANS: g	DIF: Knowledge-level	REF: 38	TOP: 2.1
16.	ANS: q	DIF: Knowledge-level	REF: 38	TOP: 2.1
17.	ANS: j	DIF: Knowledge-level	REF: 38	TOP: 2.1
18.	ANS: d	DIF: Knowledge-level	REF: 38|39	TOP: 2.1
19.	ANS: b	DIF: Knowledge-level	REF: 47	TOP: 2.3

20.	ANS: f	DIF: Knowledge-level	REF: 48	TOP: 2.4
21.	ANS: c	DIF: Knowledge-level	REF: 47	TOP: 2.3
22.	ANS: e	DIF: Knowledge-level	REF: 48	TOP: 2.4
23.	ANS: a	DIF: Knowledge-level	REF: 47	TOP: 2.3
24.	ANS: d	DIF: Knowledge-level	REF: 48	TOP: 2.4