Chapter 02 The Digestive System Mechanism for Nourishing the Body

MULTICHOICE

1. Within the lamina propria, lying just below the epithelium, is the mucosa-associated lymphoid tissue (MALT), which ____.

(A) controls secretions from the mucosal glands

(B) contains white blood cells and protects against ingested microorganisms

(C) initiates peristalsis

(D) secretes mucus, hormones, and digestive juices into the lumen

Answer : (B)

2. Which structural component of the gastrointestinal tract lies within the muscularis externa and controls the contractions that cause motility?

(A) muscularis mucosae

(B) submucosal plexus

(C) myenteric plexus

(D) lumen

Answer : (C)

3. Which structure is *not* considered an accessory organ?

(A) pancreas

(B) liver

(C) gallbladder

(D) spleen

Answer : (D)

4. Bile is most important for the digestion and absorption of ____.

(A) carbohydrates

(B) proteins

(C) fats

(D) vitamins

Answer : (C)

5. A decrease in the function of the parotid glands is most likely to result in ____.

(A) a lack of triglyceride digestion

(B) bolus that is difficult to form

(C) saliva that is too thin, that is, a high water to mucus ratio

(D) diarrhea due to malabsorption

Answer : (B)

6. What is the name of the digestive enzyme in saliva that digests starch?

(A) lipase

(B) synthetase

(C) amylase

(D) lactase

Answer : (C)

7. Which substance is *not* a component of saliva?

(A) mucus

(B) enzymes

(C) water

(D) proteases

Answer : (D)

8. Endocrine cells of the pancreas are found in which structure?

(A) the pancreatic duct

(B) the islets of Langerhans

(C) the sphincter of Oddi

(D) the beta cells

Answer : (B)

9. Delayed gastric emptying is known as ____.

(A) cholecystitis

(B) cholelithiasis

(C) gastritis

(D) gastroparesis

Answer : (D)

10. What product produced by neck cells in the oxyntic gland of the stomach protects the epithelium from mechanical and chemical damage?

(A) amylase

(B) pepsin

(C) gastrin

(D) mucus

Answer : (D)

11. Which cells, found both in the oxyntic glands and pyloric glands of the stomach, secrete hydrochloric acid and intrinsic factor?

(A) neck cells

(B) parietal cells

(C) chief cells

(D) enteroendocrine cells

Answer : (B)

12. Which cells, found in oxyntic glands in the body of the stomach, secrete pepsinogens?

(A) neck cells

(B) parietal cells

(C) chief cells

(D) enteroendocrine cells

Answer : (C)

13. Which specialized cell of the gastric epithelium secretes a hormone?

(A) neck

(B) parietal

(C) chief

(D) G-cell

Answer : (D)

14. The chief cells secrete ____.

(A) gastrin

(B) mucus

(C) zymogens

(D) hydrochloric acid

Answer : (C)

15. The parietal cells secrete ____.

(A) hydrochloric acid and intrinsic factor

(B) intrinsic factor and gastrin

(C) gastrin and zymogens

(D) zymogens and hydrochloric acid

Answer : (A)

16. Gastrin stimulates which cells?

(A) oxyntic cells

(B) parietal and chief cells

(C) pancreatic exocrine cells

(D) alpha cells

Answer : (B)

17. When the pH of the stomach is increased to avoid GERD, over time, the stomach may not be acidic enough. What is the most likely outcome?

(A) lack of carbohydrate digestion

(B) decreased protein digestion

(C) destruction of bacteria in the stomach

(D) gastric ulcer

Answer : (B)

18. Which glycoproteins bind water and are gel-forming?

(A) mucins

(B) proteoglycans

(C) prostaglandins

(D) zymogens

Answer : (A)

19. The product(s) of pepsin's action is/are ____.

(A) disaccharides

(B) amylose

(C) short-chain fatty acids

(D) hydrolyzed proteins

Answer : (D)

20. Pepcid, a drug that is classified as an H_2 receptor blocker, acts by ____.

(A) inhibiting the secretion of hydrogen ions by the parietal cells

(B) inhibiting the release of acetylcholine by the vagus nerve

(C) inhibiting the binding of gastrin to the parietal cells

(D) inhibiting the binding of histamine to the parietal cells

Answer : (D)

21. Which medication inhibits hydrogen release into the gastric juice, which reduces GI mucosal irritation?

(A) Pepcid

(B) Nexium

(C) Tums

(D) Tagamet

Answer : (B)

22. Which process allows gastric expansion with food intake with minimal impact on intragastric pressure?

(A) peristalsis

(B) receptive relaxation

(C) segmentation

(D) pendular movement

Answer : (B)

23. Pyloric glands are located predominantly ____.

(A) at the juncture of the esophagus and the stomach

(B) in the fundus and the body of the stomach

(C) in the antrum of the stomach

(D) in the cardiac portion of the stomach

Answer : (C)

24. Which phrase best describes the function of the crypt of Lieberkühn?

(A) mucus secretion

(B) glucose oxidation

(C) cellular differentiation

(D) amylase secretion

Answer : (C)

25. The pancreas is a digestive system accessory organ with two types of active tissue-the ductless endocrine cells that secrete insulin and glucagon and the ____.

(A) liver-like cells that produce bile

(B) ductless absorptive tissue that controls bicarbonate

(C) acinar exocrine cells that produce digestive enzymes

(D) erythropoietic cells that produce red blood cells

Answer : (C)

26. Pancreatic juice that enters the duodenum through the sphincter of Oddi contains all of the following EXCEPT ____.

(A) digestive enzymes

(B) intrinsic factor

(C) anions such as bicarbonate and chloride

(D) cations such as sodium, potassium, and calcium

Answer : (B)

27. In which part of the brain is the swallowing center located?

(A) the hypothalamus

(B) the medulla oblongata

(C) the thalamus

(D) the pons

Answer : (B)

28. In which organ are enzymes produced that are responsible for digestion of 50 percent of carbohydrate and protein and 90 percent of fat?

(A) liver

(B) esophagus

(C) pancreas

(D) gallbladder

Answer : (C)

29. Which hormone's major action is to alkalize intestinal contents by stimulating secretion of bicarbonate from the pancreas and by inhibiting gastric acid secretion and gastric emptying?

(A) gastrin

(B) secretin

(C) cholecystokinin

(D) GRP

Answer : (B)

30. Dumping syndrome may be caused by ____.

(A) bacterial infections

(B) viral infections

(C) partial removal of the stomach to treat obesity

(D) gall stones

Answer : (C)

31. The hormone primarily responsible for contraction of the gallbladder and release of bile into the duodenum is ____.

(A) gastrin

(B) secretin

(C) cholecystokinin

(D) GRP

Answer : (C)

32. Bile salts are synthesized from cholesterol in the ____.

(A) canaliculi

(B) common bile duct

(C) hepatocytes

(D) gallbladder

Answer : (C)

33. The surface coat of microvilli is known as ____.

(A) the glycocalyx

(B) the crypts of Lieberkühn

(C) motilin

(D) proteases

Answer : (A)

34. The total bile acid pool in the human body is 2.5 to 5 g. What percentage of bile is reabsorbed in the distal ileum?

(A) 10 percent

(B) 30 percent

(C) 65 percent

(D) 90 percent

Answer : (D)

35. A large gall stone blocking the cystic duct might result in ____.

(A) a reduction in the production of bile by the liver

(B) an increase in bile production by the liver

(C) enhancement of fat digestion

(D) interference with fat digestion

Answer : (D)

36. Which substance is enterohepatically circulated?

(A) pancreatic enzymes

(B) bile

(C) glucose

(D) CCK

Answer : (B)

37. In general, in which portion of the gastrointestinal tract does most absorption occur?

(A) esophagus

(B) stomach

(C) small intestine

(D) colon

Answer : (C)

38. A common cause of peptic ulcer disease (PUD) is the bacterium ____.

(A) *Escherichia coli*

(B) *Helicobacter pylori*

(C) *Staphylococcus aureus*

(D) *Enterobacter aerogenes*

Answer : (B)

39. Which structure helps to prevent the migration of bacteria from the large intestine back into the small intestine?

(A) the cecum

(B) the appendix

(C) the ileocecal valve

(D) the ileum

Answer : (C)

40. Which hormone(s) is/are responsible for decreasing sodium absorption in the colon?

(A) glucocorticoids

(B) mineralocorticoids

(C) vasopressin

(D) glucagon

Answer : (C)

41. Which division of the nervous system decreases digestive tract motility and secretions?

(A) parasympathetic

(B) somatic

(C) adrenergic

(D) sympathetic

Answer : (D)

42. Which hormone diminishes gastric acid secretion?

(A) somatostatin

(B) gastrin

(C) cholecystokinin

(D) pancreatic polypeptide

Answer : (A)

43. Which hormone stimulates gall bladder contraction?

(A) motilin

(B) gastrin

(C) cholecystokinin

(D) secretin

Answer : (C)

44. A deficiency in secretion of cholecystokinin might lead to which problem?

(A) a reduction in gastric acid production

(B) difficulty digesting fats

(C) difficulty digesting proteins

(D) a buildup of intestinal gas

Answer : (B)

45. When diagnosing lactose intolerance, ____ is measured in the breath following oral consumption of 50 g lactose.

(A) methane

(B) hydrogen

(C) carbon dioxide

(D) sulfur

Answer : (B)

46. Lactose intolerance is *least* common in _____.

(A) European Americans

(B) African Americans

(C) American Indians

(D) Asian Americans

Answer : (A)

47. Taking antihistamines might lead to a(n) ____.

(A) increase in stomach acid production

(B) increase in bile release

(C) decrease in stomach acid secretion

(D) reduction in pancreatic enzyme production

Answer : (C)

48. Which hormone decreases appetite?

(A) peptide YY

(B) motilin

(C) secretin

(D) pancreatic polypeptide

Answer : (A)

49. Among the regulatory peptide molecules, some are recognized as true hormones. Which substance is a paracrine rather than a hormone?

(A) somatostatin

(B) secretin

(C) cholecystokinin

(D) gastrin

Answer : (A)

50. Secretin is released from the enteroendocrine S-cell in the ____.

(A) proximal small intestine

(B) gastric mucosa

(C) esophagus

(D) colon

Answer : (A)

TRUEFALSE

51. Secretin stimulates HCl release.

(A) True

(B) False

Answer : (B)

52. CCK stimulates pancreatic zymogen release.

(A) True

(B) False

Answer : (A)

53. Leptin secretion stimulates the desire to eat.

(A) True

(B) False

Answer : (B)

54. CCK stimulates the release of bile.

(A) True

(B) False

Answer : (A)

55. GIP stimulates the release of a hormone from the pancreatic β-cells.

(A) True

(B) False

Answer : (A)

56. Eating a meal stimulates ghrelin secretion.

(A) True

(B) False

Answer : (B)

57. Ghrelin increases satiety.

(A) True

(B) False

Answer : (B)

58. Gastrin stimulates gastric acid secretion.

(A) True

(B) False

Answer : (A)

59. Peptide YY stimulates gastric acid secretion.

(A) True

(B) False

Answer : (B)

60. Secretin stimulates gastric emptying.

(A) True

(B) False

Answer : (B)

61. Short-chain fatty acids secreted by intestinal bacteria improve colonic and splanchnic blood flow.

(A) True

(B) False

Answer : (A)

62. The predominant component of saliva is amylase.

(A) True

(B) False

Answer : (B)

63. The fundus of the stomach lies below the gastroesophageal sphincter.

(A) True

(B) False

Answer : (B)

64. Villi are s-designed to increase the absorptive surface area of the small

(A) True

(B) False

Answer : (A)

65. Pancreatitis occurs when zymogens become activated within the pancreas.

(A) True

(B) False

Answer : (A)

MATCH

66. ***Digestive Substances:*** Match the substance important for digestion with its site of production.

MATCH

67. Match the corresponding action to the hormone. Each choice is used only once.

SHORTANSWER

68. Discuss the role of drug therapies such as Tagamet, Zantac, and Pepcid in the treatment of peptic ulcers.**Answer :** The answer should include the following items:

69. Describe the beneficial effects of secretions released by colonic bacteria.**Answer :** The answer should include the following items:

70. What happens to reabsorbed bile acids after transported back to the liver?**Answer :** The answer should include the following items:
Answer : Reabsorbed bile acids are reconjugated to amino acids and secreted into bile along with the newly synthesized bile acids.

71. Describe the mechanisms by which resin-type drugs and functional foods containing phytostanols lower high blood cholesterol levels.**Answer :** The answer should include the following items:

72. Broad-spectrum antibiotics are capable of killing many different bacteria, including many of those that naturally live in the intestines. Develop a hypothesis regarding the effects of broad-spectrum antibiotics on the beneficial effects of gut flora.**Answer :** The answer should include the following items:

73. What are probiotics and prebiotics? Give examples of each.**Answer :** The answer should include the following items:
Answer : Probiotics are live microorganisms (that is, active cultures of specific strains of bacteria) that when administered in adequate amounts confer health benefits to its hosts. Prebiotics (discussed in more detail in Chapter 4) are substances that are not digested by human digestive enzymes but confer health benefits to the host by acting as substrates for the growth and/or activity of one or more species of healthful bacteria in the colon.
Answer : The most common probiotic bacteria are lactic acid bacteria, usually strains of Lactobacillus and Bifidobacterium genera. To be considered a probiotic, the product must contain 100 million live active bacteria per gram. At present, probiotics are mostly consumed as yogurt with live cultures and as fermented or cultured milk and milk products (such as buttermilk and kefir). In the United States, yogurt is often fermented by Lactobacillus bulgaricus and Streptococcus thermophilus, and milk is usually fermented by L. acidophilus and L. casei. Other bacteria used to manufacture dairy products include Leuconostoc esntheroides, L. mesenteroides, and Lactococcus lactis. Other food sources of probiotics include miso, tempeh, and some soy beverages/products.

74. Discuss three of the five mechanisms by which probiotics may be helpful in diarrheal illnesses.**Answer :** The answer should include three of the following items:

75. How might an imbalance of the hormones ghrelin and leptin lead to obesity?**Answer :** The answer should include the following items:
Answer : Because ghrelin acts on the hypothalamus to stimulate appetite, and leptin suppresses food intake, an imbalance could affect an individual’s ability to control his or her appetite leading to obesity.

76. Bariatric surgery involves removal or bypass of a large portion of the stomach. Speculate on how the production of ghrelin following bariatric surgery might affect appetite and explain your reasoning.**Answer :** The answer should include the following items:

77. Discuss the functions and significance of the folds of Kerckring, the villi, and the microvilli.**Answer :** The answer should include the following items:

MULTICHOICE

78. RYGB surgery involves ____.

(A) creating a pouch after the proximal and distal portions of the stomach are separated

(B) placing a band on the stomach and creating a pouch

(C) removing 85 percent of the stomach surgically

(D) connecting the esophagus directly to the duodenum

Answer : (A)

79. The most common bariatric procedure performed in the United States is ____.

(A) gastric banding

(B) sleeve gastrectomy

(C) RYGB

(D) biliopancreatic diversion

Answer : (C)

80. Which nutritional deficiency occurs frequently following RYGB?

(A) vitamin D

(B) protein

(C) fat

(D) vitamin C

Answer : (B)

81. Deficiency of which vitamin is associated with neurological deficiencies?

(A) vitamin D

(B) vitamin C

(C) vitamin A

(D) thiamin

Answer : (D)

82. Deficiency of vitamin B_{12} occurs due to ____.

(A) inflammation of the GI tract

(B) insufficient intrinsic factor

(C) a change in diet

(D) excessive stomach acid

Answer : (B)