Chapter 3 -The Remarkable Body

MULTIPLE CHOICE

1. Which of the following descriptions best represents cells?
   a. speed up chemical reactions
   b. building blocks of the body
   c. vital components of foods
   d. self-contained living entities

   ANS: D PTS: 1 REF: Page 76 BLM: Remember

2. Along with oxygen, what is one of the cells' most basic needs?
   a. alcohol
   b. energy
   c. proteins
   d. fats

   ANS: B PTS: 1 REF: Page 76 BLM: Remember

3. On average, how often do the cells lining the digestive tract replace themselves?
   a. every 3 days
   b. every 2 weeks
   c. every 4 months
   d. every 12 months

   ANS: A PTS: 1 REF: Page 76 BLM: Remember

4. Which of the following types of cells are unable to reproduce and are lost forever if damaged by injury or disease?
   a. red blood cells
   b. muscle cells
   c. brain cells
   d. skin cells

   ANS: C PTS: 1 REF: Page 76 BLM: Remember

5. Which of the following body components determines the nature of the cell's work?
   a. genes
   b. enzymes
   c. red blood cells
   d. organs

   ANS: A PTS: 1 REF: Page 77 BLM: Remember

6. What do cells release as a waste product from the burning of oxygen and nutrients?
   a. water
   b. glycogen
   c. amino acids
   d. carbon dioxide

   ANS: D PTS: 1 REF: Page 78 BLM: Remember

7. Which of the following fluids moves from the bloodstream into tissue spaces?
   a. blood
   b. lymph
   c. plasma
   d. intracellular fluid

   ANS: B PTS: 1 REF: Page 78 BLM: Remember

8. Which one of the following organs chemically alters materials so that they can be used by other tissues?
   a. gallbladder
   b. small intestine
   c. kidneys
   d. liver

   ANS: D PTS: 1 REF: Page 80 BLM: Remember

9. Which of the following hormones is released by the pancreas in response to a high concentration of blood sugar (glucose)?
   a. insulin
   b. grehlin
   c. glucagon
   d. epinephrine

   ANS: A PTS: 1 REF: Page 82 BLM: Remember

10. What is the name for the hormone and the organ that respond to a drop in blood glucose levels in the body?
    a. glycogen and liver
    b. insulin and liver
    c. glucagon and pancreas
    d. thyroxin and thyroid

    ANS: C PTS: 1 REF: Page 82 BLM: Higher order

11. What is the name for the hormone released by the small intestine and signals the pancreas to release pancreatic fluid for the digestion process?
    a. pepsin
    b. proteases
    c. secretin
    d. cholecystokinin

    ANS: C PTS: 1 REF: Page 82 BLM: Remember

12. Which of the following body changes occurs as part of the stress response?
    a. The liver releases glucose from its stores.
    b. The muscles relax.
    c. The digestive system slows down.
    d. The blood pressure decreases.

    ANS: A PTS: 1 REF: Page 83 BLM: Remember

13. What coordinates the nervous system's role in hunger regulation?
    a. liver
    b. pancreas
    c. spinal cord
    d. brain

    ANS: D PTS: 1 REF: Page 83 BLM: Remember

14. Why might a person be able to eat when hunger sensation is absent?
    a. The stomach intensifies its contractions and creates hunger pangs.
    b. The conscious mind of the cortex can override body signals.
    c. The digestive tract sends messages to the hypothalamus.
    d. The hypothalamus anticipates the availability of nutrients.

    ANS: B PTS: 1 REF: Page 83 BLM: Higher order

15. What is the name for the part of the brain that senses a variety of conditions in the blood, such as glucose content and salt content?
    a. cerebrum
    b. pituitary gland
    c. hypothalamus
    d. frontal lobe

    ANS: C PTS: 1 REF: Page 83 BLM: Remember

16. What is the term used to describe proteins made by the immune system that combine with and inactivate specific antigens?
    a. phagocytes
    b. helper T-cells
    c. antibodies
    d. microbes

    ANS: C PTS: 1 REF: Page 84 BLM: Remember

17. Which of the following cells is the first to defend the body tissues against invaders?
    a. phagocytes
    b. T-cells
    c. lymphocytes
    d. B-cells

    ANS: A PTS: 1 REF: Page 84 BLM: Remember

18. Which cells release antibodies into the bloodstream to fight infection?
    a. helper T-cells
    b. T-cells
    c. A-cells
    d. B-cells

    ANS: D PTS: 1 REF: Page 84 BLM: Remember

19. Which of the following poses a formidable obstacle to a successful organ transplant?
    a. antibodies
    b. T-cells
    c. B-cells
    d. phagocytes

    ANS: B PTS: 1 REF: Page 84 BLM: Remember

20. What is the name of the disease in which the body's helper T-cells are attacked and destroyed?
    a. cystic fibrosis
    b. AIDS
    c. muscular dystrophy
    d. diabetes

    ANS: B PTS: 1 REF: Page 84 BLM: Higher order

21. Which of the following hormones is thought to be a "hunger hormone?"
    a. secretin
    b. gastrin
    c. grehlin
    d. glucagon

    ANS: C PTS: 1 REF: Page 85 BLM: Remember

22. What is the major role of the process known as peristalsis?
    a. making chyme
    b. pushing food through the digestive tract
    c. helping nutrients pass into the lymph system
    d. reabsorbing water

    ANS: B PTS: 1 REF: Page 86 BLM: Remember

23. Human taste buds have an inborn aversion for which of the following food items?
    a. pears
    b. pudding
    c. broccoli
    d. fruit juice

    ANS: C PTS: 1 REF: Page 86 BLM: Higher order

24. Which of the following functions does the pancreas perform?
    a. It manufactures enzymes to digest all energy yielding nutrients.
    b. It adds acid and fluid to the large intestine.
    c. It reabsorbs water and minerals.
    d. It conducts bile to the small intestine.

    ANS: A PTS: 1 REF: Page 87 BLM: Remember

25. What is the primary task of the colon during digestion and absorption of food?
    a. reabsorption of water
    b. neutralizing stomach acid
    c. absorption of vitamins
    d. breakdown of proteins

    ANS: A PTS: 1 REF: Page 88 BLM: Remember

26. What is the major site of digestion and absorption of nutrients?
    a. mouth
    b. small intestine
    c. large intestine
    d. stomach

    ANS: B PTS: 1 REF: Page 88 BLM: Remember

27. What is the name of the muscle that is responsible for controlling the release of partly digested food into the small intestine?
    a. esophageal sphincter
    b. intestinal valve
    c. pyloric valve
    d. colon valve

    ANS: C PTS: 1 REF: Page 88 BLM: Remember

28. In what part of the body does chemical digestion begin?
    a. stomach
    b. mouth
    c. liver
    d. small intestine

    ANS: B PTS: 1 REF: Page 89 BLM: Remember

29. The stomach's main function is the digestion of what nutrient or nonnutrient?
    a. carbohydrate
    b. fat
    c. fibre
    d. protein

    ANS: D PTS: 1 REF: Page 90 BLM: Remember

30. You have just consumed a meal very high in fat. As a result, hormones cause the release of what substance?
    a. bile
    b. hydrochloric acid
    c. mucus
    d. bicarbonate

    ANS: A PTS: 1 REF: Page 90 BLM: Higher order

31. Which of the following compounds is released in an effort to neutralize the acidic contents of the stomach before entering the small intestine?
    a. bile
    b. chyme
    c. gastric juice
    d. bicarbonate

    ANS: D PTS: 1 REF: Page 90-91 BLM: Remember

32. The lymphatic vessels are initially responsible for transporting which of the following products of digestion?
    a. fat
    b. protein
    c. minerals
    d. carbohydrate

    ANS: A PTS: 1 REF: Page 95 BLM: Remember

33. As a person becomes malnourished, the absorptive surface of the small intestine responds in which of the following ways?
    a. It expands in length.
    b. It becomes more efficient at its job.
    c. It decreases in size.
    d. It remains unchanged.

    ANS: C PTS: 1 REF: Page 95 BLM: Higher order

34. What is the common name for the burning sensation in the chest area caused by backflow of stomach acid into the esophagus?
    a. hernia
    b. hiccups
    c. ulcer
    d. heartburn

    ANS: D PTS: 1 REF: Page 95 BLM: Higher order

35. Which of the following advice about reducing intestinal gas is the most accurate?
    a. Rinse canned beans before consuming them.
    b. Chew gum between meals.
    c. Suck on hard candies after eating a fatty meal.
    d. Increase consumption of carbonated beverages.

    ANS: A PTS: 1 REF: Page 96 BLM: Higher order

36. What should you do to alleviate heartburn?
    a. Drink liquids during meals.
    b. Wear tight fitting clothing.
    c. Eat smaller meals.
    d. Lie down after meals.

    ANS: C PTS: 1 REF: Page 95–96 BLM: Higher order

37. Which of the following recommendations would assist most with the long-term alleviation of constipation?
    a. Take a laxative.
    b. Drink enough water.
    c. Limit physical activity.
    d. Consume foods with starch.

    ANS: B PTS: 1 REF: Page 98 BLM: Higher order

38. How long does it take for the liver's glycogen supply to be depleted if it is not replenished by food?
    a. 1–3 hours
    b. 3–6 hours
    c. 4–8 hours
    d. 6–9 hours

    ANS: B PTS: 1 REF: Page 99 BLM: Remember

39. Which of the following foods do you need to consume in intervals throughout the day?
    a. fat-containing foods
    b. mineral-rich foods
    c. vitamin-rich foods
    d. carbohydrate-containing foods

    ANS: D PTS: 1 REF: Page 99 BLM: Remember

40. The body is able to store potentially large amounts of which nutrient?
    a. fat
    b. water
    c. protein
    d. glycogen

    ANS: A PTS: 1 REF: Page 99 BLM: Remember

41. What are the recommended limits for the consumption of alcohol for the average-sized healthy woman?
    a. 3 drinks per day
    b. 4 drinks on any occasion
    c. 10 drinks per week
    d. 15 drinks per month

    ANS: C PTS: 1 REF: Page 102 BLM: Remember

42. What is the percentage of alcohol in 90 proof liquor?
    a. 10%
    b. 45%
    c. 63%
    d. 90%

    ANS: B PTS: 1 REF: Page 103 BLM: Higher order

43. Which of the following is considered one alcoholic drink?
    a. 50 mL (2 oz) shotglass of vodka
    b. 142 mL (5 oz) glass of wine
    c. 250 mL (4 oz) can of beer
    d. 500 mL (8 oz) bottle of wine cooler

    ANS: B PTS: 1 REF: Page 104 BLM: Remember

44. Which of the following situations is most likely to make a person intoxicated almost immediately when drinking alcoholic beverages?
    a. The drinks are mixed with very little water.
    b. Carbohydrate snacks are consumed at the same time.
    c. Drinks are consumed quickly.
    d. The stomach is empty.

    ANS: D PTS: 1 REF: Page 104 BLM: Higher order

45. Which of the following organs makes most of the body's alcohol-processing machinery?
    a. brain
    b. stomach
    c. pancreas
    d. liver

    ANS: D PTS: 1 REF: Page 105 BLM: Remember

46. How does alcohol affect body functions?
    a. It strengthens the body's defenses against infection.
    b. It slows down the synthesis of fatty acids.
    c. It alters amino acid metabolism.
    d. It decreases urine output.

    ANS: C PTS: 1 REF: Page 106 BLM: Remember

47. Which of the following actions will restore sobriety in someone who has been drinking alcohol?
    a. drinking coffee
    b. eating food
    c. walking
    d. passing of time

    ANS: D PTS: 1 REF: Page 107 BLM: Higher order

48. What vitamin is the most dramatically affected by excess alcohol in the body?
    a. vitamin A
    b. folate
    c. thiamine
    d. vitamin B_6

    ANS: B PTS: 1 REF: Page 108 BLM: Remember

49. What medical condition could be suspected for an individual that reports regularly consuming large amounts of alcohol, has inadequate food intake, and shows signs of poor muscle coordination, paralysis of the eye muscles, and damaged nerves?
    a. Wernicke-Korsakoff syndrome
    b. osteoporosis
    c. heart disease
    d. stomach ulcer

    ANS: A PTS: 1 REF: Page 108 BLM: Higher order

TRUE/FALSE

1. Cells form tissues that perform specialized tasks. Tissues are grouped together to form whole organs.

   ANS: T PTS: 1 REF: Page 77

2. Body fluids provide tissues with a continuous supply of energy, oxygen, and nutrients, including water.

   ANS: T PTS: 1 REF: Page 78

3. Timing of meals is important because the digestive tract is unable to digest food at certain times.

   ANS: F PTS: 1 REF: Page 88

4. The body's saliva is strongly acidic.

   ANS: F PTS: 1 REF: Page 90

5. Almost all food protein is digested and absorbed.

   ANS: T PTS: 1 REF: Page 90

6. The body stores some nutrients in much smaller quantities than other nutrients.

   ANS: T PTS: 1 REF: Page 99

MATCHING

Match the digestive organs with their appropriate functions.

a. manufacturers bile to help digest fats
b. releases bile into the small intestine
c. opens to allow elimination
d. churns, mixes, and grinds food to liquid mass
e. reabsorbs water and minerals
f. stores bile until needed
g. passes food to the stomach
h. makes enzymes to aid in the digestion of carbohydrate, protein, and fat
i. chews and mixes food with saliva
j. stores waste prior to elimination
k. contracts rhythmically to move food content along

1. stomach _____
2. gallbladder _____
3. small intestine _____
4. mouth _____
5. rectum _____
6. esophagus _____
7. anus _____
8. liver _____
9. pancreas _____
10. large intestine _____

1. ANS: D PTS: 1
2. ANS: F PTS: 1
3. ANS: K PTS: 1
4. ANS: I PTS: 1
5. ANS: J PTS: 1
6. ANS: G PTS: 1
7. ANS: C PTS: 1
8. ANS: A PTS: 1
9. ANS: H PTS: 1
10. ANS: E PTS: 1 REF: Page 87

SHORT ANSWER

1. Describe how hormones affect nutrition.

   ANS:
   Each hormone acts as a messenger that stimulates various organs to take appropriate actions. Hormones regulate hunger and affect appetite. They carry messages to regulate the digestive system. Hormones also regulate the body's reaction to stress, suppressing hunger, and the digestion and absorption of nutrients.

   PTS: 1 REF: Page 82

2. Describe what instinctively occurs within the body during the stress response and the number one health consequence for people living in modern civilization.

   ANS:
   The stress response is the body's hormone- and nerve-mediated reaction to danger. When danger is detected, nerves release neurotransmitters, and glands supply the compounds epinephrine and norepinephrine. In the modern world, stress is seldom physical, but the body reacts the same way. Modern society's number one enemy is heart disease. Years of fat and other constituents accumulating in the arteries and stresses that strain the heart often lead to heart attacks, especially when a body accustomed to chronic underexertion experiences sudden high blood pressure.

   PTS: 1 REF: Page 83-84

3. Briefly describe the actions of the body’s phagocytes and lymphocytes.

   ANS:
   Phagocytes are white blood cells that can ingest and destroy antigens. When a phagocyte recognizes a foreign particle, the phagocyte forms a pocket in its own outer membrane, engulfing the invader. Then the phagocytes may attack the invader with oxidative chemicals in an "oxidative burst" or may otherwise digest or destroy them. Phagocytes also leave a chemical trail that helps other immune cells to join the defence against infection. Lymphocytes are white blood cells that participate in the immune response. They are known as T-cells and B-cells. Killer T-cells recognize chemical messages from phagocytes and "read" and "remember" the identity of an invader from the messages. They then seek out and destroy all foreign particles with the same identity. B-cells respond rapidly to infection by dividing and releasing invader-fighting proteins – antibodies – into the bloodstream. Antibodies travel to the site of the infection and stick to the surface of the foreign particles, killing or inactivating them. Like T-cells, the B-cells also retain a chemical memory of each invader, and if the encounter recurs, the response is swift.

   PTS: 1 REF: Page 84

4. Differentiate between the mechanical and chemical aspects of digestion.

   ANS:
   Mechanical digestion begins in the mouth. From there, the digestive tract continues to move food through its various processing chambers. The mechanical actions include chewing, mixing by the stomach, adding fluid, and moving the tract's contents by peristalsis. After digestion and absorption, then wastes are excreted. Chemical digestion begins in the mouth, where food is mixed with an enzyme in saliva that acts on carbohydrates. Digestion continues in the stomach, where stomach enzymes and acid break down protein. Digestion then continues in the small intestine; there the liver and gallbladder contribute bile that emulsifies fat, and the pancreas and small intestine donate enzymes that continue digestion so that absorption can occur. Bacteria in the colon break down certain fibres.

   PTS: 1 REF: Page 86-91

5. Explain how the lining of the digestive tract is able to remain intact despite begin in contact with powerful digestive juices and enzymes.

   ANS:
   Specialized cells secrete a thick, viscous substance known as mucus. The mucus coats and protects the stomach and the rest of the digestive tract lining from exposure to digestive juices.

   PTS: 1 REF: Page 90

6. How would you respond to the statement, “people should not consume fruit and meat at the same meal?”

   ANS:
   This is not a valid argument. Proponents of “food-combining” diets claim that the digestive tract cannot perform certain digestive tasks at the same time, but this is a gross underestimation of the tract's capabilities. The digestive system adjusts to whatever mixture of foods is presented to it. The truth is that all foods, regardless of identity, are broken down by enzymes into the basic molecules that make them up.

   PTS: 1 REF: Page 91

7. Describe what happens to digestion and absorption in cases of severe undernutrition.

   ANS:
   The digestive system's millions of specialized cells are themselves exquisitely sensitive to an undersupply of energy, nutrients, or dietary fibre. In cases of severe undernutrition of energy and nutrients, the absorptive surface of the small intestine shrinks. The surface may be reduced to a tenth of its normal area, preventing it from absorbing what few nutrients a limited food supply may provide. Without sufficient fibre to provide an undigested bulk for the tract's muscles to push against, the muscles become weak from lack of exercise. Malnutrition that impairs digestion is self-perpetuating because impaired digestion makes malnutrition worse. In fact, the digestive system's needs are few, but important.

   PTS: 1 REF: Page 95

8. Explain how hiccups develop.

   ANS:
   Hiccups are spasms of both the vocal cords and the diaphragm, causing periodic, audible, short, inhaled coughs. They can be caused by irritation of the diaphragm, indigestion, or other causes. Eating or drinking too fast can cause hiccups. Hiccups usually resolve in a few minutes, but can have serious effects if prolonged.

   PTS: 1 REF: Page 95

9. What is chronic constipation and how does it impact an individual's long-term health?

   ANS:
   Constipation, infrequent and difficult bowel movements, is considered chronic when an individual experiences less than three bowel movements each week. Chronic constipation is associated with a more-than-doubled risk of colon cancer.

   PTS: 1 REF: Page 96

10. Explain the effects of antacids in managing heartburn.

    ANS:
    Antacids are designed to only temporarily relieve pain caused by heartburn. Antacids neutralize stomach acid for a while. As a result of reducing stomach acidity, the stomach responds by producing more acid in an attempt to restore the normal acid conditions.

    PTS: 1 REF: Page 96

11. Explain why sources of carbohydrate should be consumed at intervals throughout the day.

    ANS:
    Some nutrients are stored in the body in much larger quantities than others. For example, certain vitamins are stored without limit, even if they reach toxic levels within the body. Other nutrients are stored in only small amounts, regardless of the amount taken in, and these can readily be depleted. You needn't eat fat at every meal because fat is stored abundantly. However, you normally do need to have a source of carbohydrate at intervals throughout the day because the liver stores less than one day's supply of glycogen.

    PTS: 1 REF: Page 99

12. Who should not drink alcoholic beverages at all?

    ANS:
    Children/adolescents; anyone with an empty stomach; people who cannot restrict their drinking to moderate levels; women who are or may become pregnant or who are breast-feeding; people who plan to drive, operate machinery, or take part in other activities that require attention, skill, or coordination to remain safe; people taking medications that can interact with alcohol; people with certain medical conditions; and no one should drink when they are alone.

    PTS: 1 REF: Page 103

13. What advice would you give to someone interested in improving appetite with alcohol?

    ANS:
    Alcoholic beverages affect the appetite. Usually they reduce it, making people unaware that they are hungry. But in people who are tense and unable to eat, or in the elderly who have lost interest in food, a small dose of wine taken 20 minutes before meals may improve appetite. For undernourished people and for people with severely depressed appetites, wine may facilitate eating even when psychotherapy fails to do so. However, alcohol is still a toxin, and should be used in moderation.

    PTS: 1 REF: Page 109