CHAPTER 2: THE BODY'S PHYSICAL SYSTEMS
True/False Statements

1. The transmission of messages through the axon ordinarily follows the order from axon, to cell body, to dendrite.

Answer: False
Section Reference: How the Nervous System Works

2. Damage to the myelin sheath tends to produce little noticeable effect in motor functioning.

Answer: False
Section Reference: How the Nervous System Works

3. The thalamus is known as the chief relay station in the brain because it directs sensory information to various parts of the brain and motor information to the skeletal muscles.

Answer: True
Section Reference: The Central Nervous System

4. Insufficient production of insulin results in diabetes mellitus.

Answer: True
Section Reference: Other Glands

5. In the digestive system, enzymes are active only in the small intestine.

Answer: False
Section Reference: Food's Journey Through the Digestive Tract

6. The basal metabolic rate is the number of calories burned when our bodies are at rest and is higher in males than females.

Answer: False
Section Reference: Using Nutrients in Metabolism

7. The chemical processes in metabolism require oxygen.

Answer: True
Section Reference: The Respiratory System

8. Blood pressure is a phenomenon that results from the fact that the circulatory system is a closed system.

Answer: True
Section Reference: Blood Pressure)

9. Organ transplants fail because the immune system identifies the transplanted tissue as an antigen.

Answer: True
Section Reference: Antigens

10. The thalamus is the maturation site for white blood (T) cells.

Answer: False
Section Reference: Soldiers of the Immune System

Matching

11. Match one of the following with descriptions given in questions one to five.
    a. frontal lobe
    b. temporal lobe
    c. parietal lobe
    d. occipital lobe
    e. thalamus

12. Serves as the chief relay station for sensory messages coming in and for motor commands out to the skeletal muscles

Answer: e
Section Reference: The Central Nervous System

13. Involved in hearing and memory

Answer: b
Section Reference: The Central Nervous System

14. Contains the motor cortex

Answer: a
Section Reference: The Central Nervous System

15. The primary visual cortex

Answer: d
Section Reference: The Central Nervous System)

16. Involved in body sensations such as of pain, cold, heat, and touch

Answer: c
Section Reference: The Central Nervous System

Match one of the following with the descriptions given in questions six to ten.
    a. killer T cells

b. memory T cells
c. delayed-hypersensitivity T cells
d. helper T cells
e. suppressor T cells

17. Operate to slow down or stop immunity processes.

Answer: e
Section Reference: Soldiers of the Immune System

18. Directly attack cancerous cells, transplanted tissue and cells invaded by antigens.

Answer: a
Section Reference: Soldiers of the Immune System

19. Report invasions and stimulate lymphocyte production in the spleen and lymph nodes.

Answer: d
Section Reference: Soldiers of the Immune System

20. Produce lymphokines, which stimulates other T-cells to grow.

Answer: c
Section Reference: Soldiers of the Immune System

21. The fact that one usually has mumps only once in life is the result of these cells.

Section Reference: Soldiers of the Immune System

Multiple Choice

22. Which of the following is NOT a part of a neuron?
a) axon
b) dendrite
c) synaptic knob
d) septum

Answer: d
Section Reference: How the Nervous System Works)

23. Specialized nerve cells called _____ are responsible for communication in the nervous system.
a) neurons
b) glial cells
c) transmitter cells
d) C cells

Answer: a
Section Reference: How the Nervous System Works

24. Chemical messengers called neurotransmitters
a) transmit messages along the axon.
b) may inhibit, but not excite a neuron.
c) may either inhibit or excite a neuron.
d) are found only in the dendrite.

Answer: c
How the Nervous System Works)

25. The neurological disease called multiple sclerosis
a) results from the deterioration of the myelin sheath.
b) produces a lack of motor coordination.
c) is caused by neural tangles.
d) both a and b

Answer: d
Section Reference: How the Nervous System Works

26. Which of the following occurs to the brain as we age?

a) New neurons continue to form.
b) Glial cells increase in number.
c) Myelination increases.
d) both b and c

Answer: d
Section Reference: How the Nervous System Works

27. Chronic poor nutrition early in life does which of the following?
a) It has little to no long-lasting effects on motor and intellectual performance.
b) It results in impaired development of myelin, glial cells, and dendrites.
c) It affects adult brain deterioration but not childhood motor and mental functioning.
d) It affects only motor functioning in young children.

Answer: b
Section Reference: How the Nervous System Works

28. Which of the statements below accurately describes the roles of the right and left hemispheres of the brain in most people?
a) They perform essentially the same functions.
b) The left hemisphere controls vision and the right hemisphere controls body balance.
c) The left hemisphere controls language whereas the right controls emotions.
d) In adults the functions of each hemisphere are interchangeable.

Answer: c
Section Reference: The Central Nervous System

29. Following a sharp blow to the back of her head, Shelley developed partial blindness. Which part of her brain was most likely injured?
a) cerebellum
b) frontal lobe
c) parietal lobe
d) occipital lobe

Answer: d
Section Reference: The Central Nervous System

30. Marty's neurologist suspects his obesity might be due to damage in his brain. Which structure does he suspect is damaged?
a) parietal lobe
b) thalamus

c) hypothalamus
d) brain stem

Answer: c
Section Reference: The Central Nervous System)

31. Michael J. Fox and Mohammed Ali are two famous persons with Parkinson's disease. They very likely experience _____ due to damage to their _____.
a) seizures; reticular system
b) trouble breathing; medulla
c) ataxia; cerebellum
d) tremors; midbrain

Answer: d
Section Reference: The Central Nervous System

32. Alice, a childhood victim of polio, requires an artificial breathing device due to damage to her _____.
a) pons
b) medulla
c) hypothalamus
d) midbrain

Answer: b
Section Reference: How the Nervous System Works

33. The _____ nervous system controls the activities of the visceral organs under normal conditions; the _____nervous system mobilizes the body in response to stress.
a) parasympathetic; sympathetic
b) sympathetic; parasympathetic
c) somatic; autonomic
d) autonomic; somatic

Answer: a
Section Reference: How the Nervous System Works

34. Parkinson’s disease is associated with which of the body’s physical systems?
a) endocrine system

b) immune system
c) cardiovascular system
d) respiratory system
e) central nervous system

Answer: e
Section Reference: The Central Nervous System

35. This bodily system is responsible for interpreting incoming sensory information, then sending out instructions on how the body should react:
a) Renal system
b) Cardiovascular system
c) Endocrine system
d) Central Nervous system
e) Digestive system

Answer: d
Section Reference: How the Nervous System Works

36. Results of studies on biofeedback treatment for paralysis due to stroke indicate
a) psychotherapy is a more effective intervention than biofeedback.
b) biofeedback works only if conducted daily.
c) as few as two biofeedback sessions per week improved muscle function in a 6 week trial.
d) surgery combined with biofeedback is necessary for successful treatment.

Answer: c
Section Reference: Biofeedback Treatment for Paralysis)

37. Teddy is afraid of needles and injections. Whenever the nurse attempts to give him an injection, he screams and flails his arms and legs wildly. His heart rate increases, and he begins to sweat profusely, which indicates activation of the
a) cerebral cortex.
b) sympathetic nervous system.
c) parasympathetic nervous system.
d) pituitary gland.

Answer: b
Section Reference: The Peripheral Nervous System

38. The endocrine system is to _____ communication as the nervous system is to _____ communication.
a) chemical; mechanical
b) cellular; systemic
c) chemical; electrochemical
d) local; global

Answer: c
Section Reference: The Endocrine System

39. The "master gland" of the endocrine system, the pituitary gland:
a) controls the secretion of other glands.
b) releases hormones into the blood.
c) releases ACTH, which affects emergency reactions.
d) all of the above

Answer: d
Section Reference: The Endocrine and Nervous Systems Working Together)

40. Which pituitary hormone is released during an emergency?
a) ACTH (adrenocorticotropic hormone)
b) cortisol
c) epinephrine
d) norepinephrine

Answer: a
Section Reference: The Endocrine and Nervous Systems Working Together

41. When you leap out of the path of a speeding car, the adrenal hormone _____ is released, causing an increase in respiration and heart rate.
a) insulin
b) ACTH
c) epinephrine
d) thyroxine

Answer: c
Section Reference: Adrenal Glands

42. Dwarfism and intellectual deficiency are often the result of

a) hypothyroidism.
b) high levels of cortisol in the blood.
c) a diseased pancreas.
d) excessive secretion of adrenal hormones.

Answer: a
Section Reference: Other Glands

43. A co-worker has recently behaved in a restless and irritable manner and seems confused. A possible physical cause for such behaviour is
a) a diseased thymus gland.
b) excessive thyroid secretion.
c) too little thyroid secretion.
d) none of the above

Answer: b
Section Reference: Other Glands

44. The actual digestive process begins in the
a) liver.
b) esophagus with the secretion of certain enzymes.
c) duodenum.
d) mouth.

Answer: d
Section Reference: Food's Journey Through the Digestive Tract

45. Research on sex differences in the organ systems and glands indicates that
a) differences between males and females are learned and not physiological.
b) females do not exhibit the symptoms of Graves' disease.
c) males actually secrete more hormones under stress than females do.
d) there are no statistically significant differences in these systems.

Answer: c
Section Reference: Our Physiological Individuality

46. The major gastric juices produced in the stomach are
a) pepto and bismol.
b) hydrochloric acid and peristalase.

c) hydrochloric acid and pepsin.
d) insulin and bile.

Answer: c
Section Reference: Food's Journey Through the Digestive Tract)

47. In the small intestine, which does NOT occur?
a) The food mixture becomes alkaline.
b) Enzymes are received from the pancreas.
c) Most ingested materials the body uses are absorbed into the bloodstream.
d) Storage of feces takes place.

Answer: d
Section Reference: Food's Journey Through the Digestive Tract

48. Most of the ingested substances our bodies use are absorbed into the bloodstream through the lining of the
a) colon.
b) stomach.
c) esophagus.
d) small intestine.

Answer: d
Section Reference: Food's Journey Through the Digestive Tract

49. Which of the following is <u>not</u> typically a disease of the liver?
a) ulcers
b) cirrhosis
c) hepatitis
d) anemia

Answer: a
Section Reference: Food's Journey Through the Digestive Tract

50. Which of the following diseases of the liver is not transmitted by sexual contact?
a) hepatitis A
b) hepatitis B
c) hepatitis C
d) All the above diseases are transmitted by sexual contact.

Answer: a
Section Reference: Food's Journey Through the Digestive Tract

51. Serum hepatitis, or hepatitis B, is often transmitted through
a) stress or poor diet.
b) transfusion of infected blood or using contaminated needles.
c) handling or eating contaminated food.
d) kissing and fondling.

Answer: b
Section Reference: Food's Journey Through the Digestive Tract

52. The basal metabolic rate is
a) not affected by the size of the body.
b) exactly the same regardless of gender.
c) constant across the life span.
d) none of the above

Answer: d
Section Reference: Using Nutrients in Metabolism

53. Lower basal metabolic rates are associated with
a) males more than females.
b) those who live in cold climates.
c) individuals under stress.
d) increasing age.

Answer: d
Section Reference: Using Nutrients in Metabolism)

54. Bearing in mind the factors that affect metabolism, the best advice for an individual desiring to lose weight would be
a) to eat more food so as to stimulate your digestive system and therefore increase your BMR.
b) eat less.
c) exercise more to raise metabolism above basal rate.
d) both b and c.

Answer: d
Section Reference: Using Nutrients in Metabolism

55. The act of breathing (respiration) does which of the following?
a) Supplies the body with oxygen.
b) Supplies a necessary component for metabolism.
c) Helps us get rid of a specific waste product.
d) all of the above

Answer: d
Section Reference: The Respiratory System

56. Select the correct sequence of the passage of air in the respiratory system.
a) trachea, bronchial tubes, bronchioles, alveoli
b) trachea, bronchial tubes, alveoli, bronchioles
c) trachea, bronchioles, bronchial tubes, alveoli
d) bronchial tubes, trachea, bronchioles, alveoli

Answer: a
Section Reference: The Respiratory Tract

57. Breathing rate is controlled by the
a) lungs.
b) medulla.
c) bronchioles.
d) hypothalamus.

Answer: b
Section Reference: Respiratory Function and Disorders

58. Which bodily action(s) do not serve to protect the respiratory system?
a) sneezing
b) hiccuping
c) coughing
d) mucociliary escalation and swallowing

Answer: b
Section Reference: Respiratory Function and Disorders

59. Which of the following is not a disease or disorder of the respiratory system?
a) cystic fibrosis

b) hypertension
c) pneumoconiosis
d) asthma

Answer: b
Section Reference: Respiratory Function and Disorders

60. The oxygenation of blood takes place in the
a) atriums
b) ventricles
c) lungs
d) aorta

Answer: c
Section Reference: The Heart and Blood Vessels

61. Which bodily organs cleanse the blood of impurities?
a) kidneys and liver
b) liver and gall bladder
c) gall bladder and lungs
d) right atrium and right ventricle
Answer: a
Section Reference: The Heart and Blood Vessels)

62. Taking into account the laws of fluid dynamics, which of the conditions below would not typically result in increased blood pressure?
a) decreasing blood vessel elasticity
b) thinner blood vessels
c) thinner blood
d) all of these would result in increased blood pressure

Answer: c
Section Reference: Blood Pressure

63. Which of the following results in an immediate decrease in blood pressure?
a) exercise
b) standing up quickly
c) cold weather
d) emotional arousal

Answer: b
Section reference: Blood Pressure

64. After a recent physical, your physician tells you that your blood pressure is 120/80. You are
a) hypertensive.
b) normotensive (normal).
c) hypotensive.
d) just nervous because you're at the doctor's office.

Answer: b
Section Reference: Blood Pressure

65. Which of the following is not a risk factor for hypertension?
a) race
b) gender
c) age
d) all of these are risk factors

Answer: d
Section Reference: Blood Pressure

66. Which of the following statements about red blood cells is not true?
a) They are formed in the bone marrow.
b) Their primary function is to fight infection.
c) They are carriers of hemoglobin.
d) They live for about 3 months.

Answer: b
Section Reference: Blood Composition

67. Which of the following is true regarding leukocytes?
a) They contain hemoglobin.
b) They assist in the clotting process.
c) Their primary function is to help fight infection.
d) They are actually red blood cells damaged by anemia.

Answer: c
Section Reference: Blood Composition

68. The most abundant lipid in the body is a material formed of glycerol and fatty acid called
a) triglyceride.
b) cholesterol.
c) thrombosis.
d) glycid.

Answer: a
Section Reference: Blood Composition

69. John stepped on a nail a few days ago and has developed a bacterial infection that his immune system is fighting. The bacteria in his body that triggered an immune response are called
a) allergens.
b) enzymes.
c) white blood cells.
d) antigens.

Answer: d
Section Reference: Antigens

70. Which of the following are not antigens?
a) viruses
b) bacteria
c) leukocytes
d) protozoa

Answer: c
Section Reference: Antigens

71. The "home base" organ for white blood cells is the
a) lymph nodes.
b) heart.
c) spleen.
d) thymus.

Answer: c
Section Reference: The Organs of the Immune System

72. Macrophages and neutrophils are
a) specialized T cells.
b) involved in cell-mediated immunity.
c) lymphocytes.
d) involved in non-specific immunity.

Answer: d
Section Reference: Soldiers of the Immune System

73. Which of the following statements regarding AIDS is not true?
a) It does not kill directly.
b) Although millions of people have the disease worldwide, most of the deaths have occurred in North America.
c) It is caused by a virus.
d) It affects T cells.

Answer: b
Section Reference: When Immune Functions are Absent

74. The key distinction between phagocytes and lymphocytes is
a) phagocytes are involved in nonspecific immunity and lymphocytes in specific immunity.
b) phagocytes are red blood cells.
c) lymphocytes do not attack specific antigens.
d) phagocytes cannot be replenished.

Answer: a
Section Reference: Soldiers of the Immune System

75. The "t" in T cells refers to their site of maturation, the _____.
a) thymus
b) thyroid
c) tongue
d) tonsils

Answer: a
Section Reference: Soldiers of the Immune System

76. One of your body's first lines of defense against infection is

a) good hygiene.
b) antiseptics.
c) antibiotics.
d) your skin.

Answer: d
Section Reference: Defending the Body with an Immune Response

77. Antibody-mediated immunity differs from cell-mediated immunity
a) in no significant way.
b) because of its use of T cells.
c) because antibody-mediated immunity attacks antibodies within the body's cells.
d) because antibody-mediated immunity attacks antigens in bodily fluids rather than infected body cells.

Answer: d
Section Reference: Soldiers of the Immune System

78. Evidence indicates that stress and illness are related because stress
a) suppresses the respiratory system.
b) suppresses the immune system.
c) leads to increased damage to the hypothalamus.
d) increases our basal metabolism rate which makes us age faster.

Answer: b
Section Reference: Less-Than-Optimal Defences

79. Kiecolt-Glaser and her colleagues found that killer T cell activity
a) was unrelated to stress.
b) was directly related to the presence of antigens.
c) was low in highly stressed individuals.
d) was higher in highly stressed individuals.

Answer: c
Section Reference: Less-Than-Optimal Defences

80. Studies have shown immunosuppression in which of the following conditions?
a) Following stressful final exams.
b) Immediately after the death of a spouse.

c) Among women unsatisfied in their marriage.
d) all of the above

Answer: d
Section Reference: Less-Than-Optimal Defences

81. A condition in which one's immune response is directed at parts of the body it should protect is referred to as a(n)
a) immune disease.
b) rheumatic disease.
c) autoimmune disease.
d) none of the above

Answer: c
Section Reference: Less-Than-Optimal Defences

Short Answer Questions

82. Compare and contrast the communication systems in the endocrine system versus the nervous system.

83. Discuss the issue of individual variability in internal systems between people. Provide evidence to support your answer.

84. Compare and contrast cell-mediated immunity and antibody-mediated immunity.

Essay Questions

85. Derek has just been bitten by a dog. Explain what is happening within two of the systems of his body as a result.

86. This chapter describes a number of diseases or disorders that can occur in the six systems reviewed. What linkages exist between the discussion in this chapter and the discussion of common definitions of health and illness in Chapter 1?

87. Sun has high blood pressure. Discuss the mechanical, psychological, environmental, and demographic factors that may be an influence on her condition.