

## Chapter 2 The Biology of Mind and Behavior: The Brain in Action

### Multiple-Choice Questions

**Key: Answer, Page, Type, Level**

#### Type

*A=Applied*

*C=Conceptual*

*F=Factual*

#### Level

*(1)=Easy; (2)=Moderate; (3)=Difficult*

**p=page**

1. The physical characteristics of the brain give rise to \_\_\_\_\_ contents and processes.

a) sensory

*Incorrect. The brain is responsible for processing sensory events, but it does not give rise to them.*

b) intellectual

c) mental

*Correct. The brain can be thought of as a mental organ that gives rise to mental contents and processes.*

d) iterative

**ANS: C, p. 43, C, (3)**

Section: Brain Circuits: Making Connections

2. The function of the \_\_\_\_\_ is to carry information to and from all parts of the body.

a) soma

*Incorrect. The primary responsibility of the soma is to maintain the life of the neuron.*

b) synapse

c) nervous system

*Correct. Sending information to and from all parts of the body is the primary function of the nervous system.*

d) endorphins

**ANS: C, p. 43, F, (3)**

Section: Brain Circuits: Making Connections

**% correct 91 a= 2 b= 4 c= 91 d=33 r = .32**

**% correct 100 a= 0 b= 0 c= 100 d= 0 r = .00**

3. A(n) \_\_\_\_\_ is a specialized cell that receives, processes, and sends information.

a) axon

b) dendrite

c) neuron

d) synapse

**ANS: C, p. 43, F, (1)**

Section: Brain Circuits: Making Connections

4. A specialized cell that makes up the nervous system that receives and sends messages within that system is called a \_\_\_\_\_.

a) glial cell

*Incorrect. Glial cells serve as a structure for neurons.*

b) neuron

*Correct. A neuron is a specialized cell that makes up the nervous system that receives and sends messages within that system.*

c) cell body

d) myelin sheath

**ANS: B, p. 43, F, (1),**

Section: Brain Circuits: Making Connections

**% correct 96 a= 4 b= 96 c= 0 d= 0 r = .19**

5. What term is used to describe a specialized cell that makes up the nervous system and receives and sends messages within that system?

a) neuron

*Correct. A neuron is a specialized cell that makes up the nervous system and receives and sends messages within that system.*

b) glial cell

*Incorrect. Glial cells serve as a structure for neurons.*

c) myelin sheath

d) dendritic spine

**ANS: A, p. 43, F, (1)**

Section: Brain Circuits: Making Connections

**% correct 96 a= 96 b= 3 c= 1 d= 0 r = .25**

6. Which of the following are the three basic types of neurons?

a) reflexes, sensory neurons, motor neurons

*Incorrect. Reflexes are not a type of neuron.*

b) sensory neurons, motor neurons, stem cells

c) motor neurons, stem cells, reflexes

d) interneurons, sensory neurons, motor neurons

*Correct. All of these are neurons.*

**ANS: D, p. 43, F, (1)**

Section: Brain Circuits: Making Connections

**% correct 89 a= 3 b= 7 c= 0 d= 89 r = .36**

7. The three types of neurons are \_\_\_\_\_.

a) sensory neurons, excitation neurons, and intraneurons

b) receptor neurons, excitation neurons, and intraneurons

c) cell bodies, cell membranes, and ions

d) sensory neurons, motor neurons, and interneurons

**ANS: D, p. 43, F, (1)**

Section: Brain Circuits: Making Connections

8. Neurons that carry information from the senses to the spinal cord are called \_\_\_\_\_.

- a) motor neurons
- b) interneurons

*Incorrect. Interneurons connect sensory neurons to the motor neurons.*

- c) sensory neurons

*Correct. Sensory neurons carry information from the senses to the spinal cord.*

- d) reflexes

**ANS: C, p. 43, F, (1)**

Section: Brain Circuits: Making Connections

**% correct 75 a= 19 b= 5 c= 75 d= 0 r = .32**

9. LaKeisha stepped on a piece of glass and quickly pulled her foot away from that sharp object. Which of the following are responsible for sending a message to the muscles in LaKeisha's foot, resulting in her pulling her foot away from the piece of glass?

- a) motor neurons

*Correct. Motor neurons carry messages from the central nervous system to the muscles of the body.*

- b) interneurons

*Incorrect. Interneurons connect the sensory neurons to the motor neurons.*

- c) sensory neurons

- d) reflexes

**ANS: A, p. 43, A, (3)**

Section: Brain Circuits: Making Connections

**% correct 58 a= 58 b= 2 c= 18 d= 521 r = .27**

10. Mary put her hand on a hot stove. Which neuron is responsible for sending a pain message up her spinal column, where it would then enter into the main area of the cord?

- a) motor neuron
- b) interneuron

*Incorrect. Sensory neurons carry information from the senses to the spinal cord.*

- c) sensory neuron

*Correct. Sensory neurons carry information from the senses to the spinal cord.*

- d) reflex

**ANS: C, p. 43, A, (2)**

Section: Brain Circuits: Making Connections

**% correct 90 a= 5 b= 3 c= 90 d= 1 r = .27**

11. Dendrite is to axon as \_\_\_\_\_.

- a) send is to receive

*Incorrect. This is the opposite of the correct answer.*

- b) send is to regulate

- c) receive is to send

*Correct. Dendrites are treelike parts of the neuron that are designed to receive messages. The axon sends messages to other neurons.*

d) receive is to release

**ANS: C, p. 44, C, (2)**

Section: Brain Circuits: Making Connections

12. \_\_\_\_\_ receive messages from other neurons and \_\_\_\_\_ send messages to other neurons.

a) Axons; dendrites

*Incorrect. Axons send messages, and dendrites receive messages.*

b) Axon; soma

c) Soma; glial cells

d) Dendrites; axons

*Correct. Dendrites receive messages, and axons send messages to other cells.*

**ANS: D, p. 44 C, (2)**

Section: Brain Circuits: Making Connections

**% correct 71 a= 23 b= 3 c= 4 d= 71 r = .39**

13. The branchlike structures that receive messages from other neurons are called \_\_\_\_\_.

a) axons

*Incorrect. Axons send but do not receive messages.*

b) nerve bundles

c) dendrites

*Correct. Dendrites receive messages from other neurons.*

d) synapses

**ANS: C, p. 44, F, (1)**

Section: Brain Circuits: Making Connections

**% correct 84 a= 10 b= 2 c= 84 d= 4 r = .39**

**% correct 93 a=0 b= 0 c= 93 d= 7 r = .19**

14. The function of the neuron's axon is to \_\_\_\_\_.

a) carry messages to other cells

*Correct. The function of the axon is to carry messages to other cells.*

b) regulate the neuron's life processes

c) receive messages from neighboring neurons

*Incorrect. Dendrites, not axons, receive messages.*

d) insulate against leakage of electrical impulses

**ANS: A, p. 44, F, (2)**

Section: Brain Circuits: Making Connections

**% correct 67 a= 67 b= 2 c= 35 d= 53 r = .41**

15. Which of the following best represents the order in which a neuron receives and transmits information?

a) dendrites, cell body, axon, terminal buttons

*Correct. The dendrite receives a message, the cell body processes it, the axon takes a message to the terminal buttons, and the terminal buttons release neurotransmitters.*

- b) terminal buttons, dendrites, cell body, axon
- c) cell body, dendrites, terminal buttons, axon

*Incorrect. Every part of this answer is out of the correct order.*

- d) axon, cell body, dendrites, terminal buttons

**ANS: A, p. 44, C, (2)**

Section: Brain Circuits: Making Connections

16. What is the term used to describe the branches located at the end of the axon?

- a) terminal buttons
- b) synaptic vesicles
- c) synapses
- d) receptor sites

**ANS: A, p. 44, F, (2)**

Section: Brain Circuits: Making Connections

17. What do we call the state of a neuron when it is not firing a neural impulse?

- a) action potential

*Incorrect. Action potential is the state a neuron is in when firing a neural impulse.*

- b) resting potential

*Correct. Resting potential is the state a neuron is in when not firing a neural impulse.*

- c) myelination signal
- d) transmission impulse

**ANS: B, p. 44, F, (1)**

Section: Brain Circuits: Making Connections

**% correct 84 a= 11 b= 84 c= 1 d=4 r = .18**

18. The state during which a neuron contains more negatively charged ions inside the cell than outside the cell and is not firing is referred to as the\_\_\_\_\_.

- a) action potential

*Incorrect. Action potential is the state a neuron is in when firing.*

- b) quiet potential
- c) synaptic potential
- d) resting potential

*Correct. Resting potential is the state a neuron is in when a cell is not firing a neural impulse.*

**ANS: D, pp. 44–45, F, (2)**

Section: Brain Circuits: Making Connections

**% correct 85 a= 4 b= 4 c= 7 d= 85 r = .19**

19. The charge that a neuron at rest maintains is due to the presence of a high number of \_\_\_\_\_ charged ions inside the neuron's membrane.

- a) actively
- b) passively
- c) negatively

*Correct. Negatively charged ions inside of the neurons membrane is what gives rise to a negative resting potential.*

d) positively

*Incorrect. It is during the action potential the positively charged ions flow into the neuron and outnumber the negatively charged ions.*

**ANS: C, pp. 44–45, C, (2)**

Section: Brain Circuits: Making Connections

20. “All or none” is the principle stating that \_\_\_\_\_.

a) a neuron either fires or does not fire

*Correct. A neuron either fires or does not fire.*

b) a neuron fires at full strength or not at all

*Incorrect. Neurons can fire at different strengths.*

c) all the dendrites must be receiving messages telling the neuron to fire or it will not fire at all

d) all somas must be receiving messages telling the neuron to fire or it will not fire at all

**ANS: A, p. 45, C, (2)**

Section: Brain Circuits: Making Connections

**% correct 54 a= 54 b= 31 c= 10 d= 5 r = .37**

**% correct 41 a= 41 b= 52 c= 4 d= 3 r = .29**

21. When a neuron fires, it fires in a(n) \_\_\_\_\_ fashion, because there is no such thing as “partial” firing.

a) all-or-none

*Correct. This is the term used to describe how neurons fire according to the book.*

b) rapid fire

c) accidental patterned

d) quick succession

*Incorrect. This is not the term referred to by the book.*

**ANS: A, p. 45, C, (2)**

Section: Brain Circuits: Making Connections

22. The term “fire” when referring to neural transmission indicates that a neuron \_\_\_\_\_.

a) has become less positive in charge

b) has received, in its dendrites, appropriate inputs from other neurons

*Correct. A neuron fires after the dendrites receive enough stimulation to trigger the cell body to generate an action potential.*

c) is unable to transmit information to another neuron

d) has become more negative in charge

*Incorrect. In fact, the firing state of the neuron occurs when it generates a positive charge rather than a negative charge.*

**ANS: B, p. 45, C, (2)**

Section: Brain Circuits: Making Connections

23. What is the function of myelin?

- a) to serve as a structure for neurons

*Incorrect. This is the function of glial cells, not myelin.*

- b) to monitor neural activity
- c) to speed up the neural impulse

*Correct. Myelin speeds up the neural impulse.*

- d) to produce neurotransmitters

**ANS: C, p. 45, F, (2)**

Section: Brain Circuits: Making Connections

**% correct 71 a= 14 b= 7 c= 71 d= 9 r = .33**

24. A fatty substance that is wrapped around the shaft of axons in the nervous system and whose function is to insulate neurons and speed up the neural impulse is called a \_\_\_\_\_.

- a) synaptic vesicle
- b) dendrite
- c) glial cell

*Incorrect. Glial cells do not speed up the neural impulse.*

- d) myelin cell

*Correct. Myelin cells speed up the neural impulse.*

**ANS: D, p. 45, F, (2)**

Section: Brain Circuits: Making Connections

**% correct 79 a= 7 b= 7 c= 7 d= 79 r = .41**

25. Which of the following is true about myelin?

- a) It's a fatty substance.

*Correct. Myelin is made up of a type of tissue called glial cells.*

- b) It is covered by axons.

*Incorrect. Myelin covers axons. It is not covered by axons.*

- c) It inhibits neural communication.
- d) It slows down neuronal operations.

**ANS: A, p. 45, C, (2)**

Section: Brain Circuits: Making Connections

26. The precise location where communication between neurons occurs is the \_\_\_\_\_.

- a) neuromodulator
- b) synapse
- c) terminal button
- d) myelin sheath

**ANS: B, p. 46, F, (2)**

Section: Brain Circuits: Making Connections

27. A chemical found in the synaptic vesicles which, when released, has an effect on the next cell is called a \_\_\_\_\_.

- a) glial cell
- b) neurotransmitter

*Correct. Neurotransmitters are stored in the synaptic vesicles.*

- c) precursor cell
- d) synapse

*Incorrect. The synapse is the space between the synaptic knob of one cell and the dendrites of the next cell.*

**ANS: B, p. 46, F, (1)**

Section: Brain Circuits: Making Connections

**% correct 74 a= 4 b= 74 c= 4 d= 18 r = .34**

28. The saclike structures found inside the synaptic knob containing chemicals are called\_\_\_\_\_.

- a) axon terminals

*Incorrect. The axon terminals are limblike structures.*

- b) synapses
- c) synaptic vesicles

*Correct. Synaptic vesicles are structures within the synaptic knobs.*

- d) receptor sites

**ANS: C, pp. 46–47, F, (1)**

Section: Brain Circuits: Making Connections

**% correct 69 a= 5 b= 8 c= 69 d= 17 r = .53**

29. The action potential causes neurotransmitters to be released into the \_\_\_\_\_.

- a) myelin sheath
- b) axon
- c) synapse

*Correct. Neurotransmitters are released into the synapse.*

- d) synaptic vesicle

*Incorrect. Neurotransmitters are stored in the synaptic vesicle.*

**ANS: C, p. 47, C, (2)**

Section: Brain Circuits: Making Connections

**% correct 59 a= 8 b= 11 c= 59 d= 22 r = .32**

30. Sara has been experiencing a serious memory problem. An interdisciplinary team has ruled out a range of causes and believes that a neurotransmitter is involved. Which neurotransmitter is most likely involved in this problem?

- a) GABA

*Incorrect. GABA has a tranquilizing effect.*

- b) dopamine
- c) serotonin
- d) acetylcholine

*Correct. Acetylcholine is found in a part of the brain responsible for forming new memories.*

**ANS: D, p. 47, A, (2)**

Section: Brain Circuits: Making Connections

**% correct 33 a= 0 b= 26 c=41 d= 33 r = .19**

31. Which neurotransmitter is associated with sleep and mood?

a) GABA

*Incorrect. GABA is associated with helping calm anxiety.*

b) serotonin

*Correct. Serotonin is associated with mood, sleep, and appetite.*

c) dopamine

d) acetylcholine

**ANS: B, p. 47, F (1)**

Section: Brain Circuits: Making Connections

32. Andy has decided to seek medical help for mood disturbances and appetite problems.

Which neurotransmitter is most likely involved in the problems Andy is experiencing?

a) GABA

*Incorrect. GABA is involved in sleep and inhibits movement but is not associated with mood or appetite.*

b) Dopamine

c) Serotonin

*Correct. Serotonin is associated with mood and appetite.*

d) Acetylcholine

**ANS: C, p. 47, A, (1)**

Section: Brain Circuits: Making Connections

33. Endogenous cannabinoids are neurotransmitter substances that \_\_\_\_\_.

a) influence the activity of the receiving neuron

b) affect imprecise locations on neurons

c) work by influencing the activity of a sending neuron

d) influence visual processing of information

**ANS: C, p. 47, F, (2)**

Section: Brain Circuits: Making Connections

34. A receptor is a site that can be found \_\_\_\_\_.

a) on dendrites or cell bodies

b) only on cell bodies

c) only on axons

d) on axons or cell bodies

**ANS: A, p. 47, F, (2)**

Section: Brain Circuits: Making Connections

35. Which structure is like a locked door that only certain neurotransmitter keys can unlock?

a) synapses

*Incorrect. Synapses are microscopic fluid-filled spaces between neurons.*

b) receptor sites

*Correct. Only certain neurotransmitters can fit into receptor sites.*

c) neural chiasm

d) response terminals

**ANS: B, p. 47, C, (2)**

Section: Brain Circuits: Making Connections

36. A(n) \_\_\_\_\_ is a site on the dendrite or cell body where a neurotransmitter molecule attaches itself.

- a) agonist
- b) antagonist
- c) neuromodulator
- d) receptor

**ANS: D, p. 47-48, F, (2)**

Section: Brain Circuits: Making Connections

37. Reuptake refers to \_\_\_\_\_.

- a) an area where neurotransmitters or neuromodulators attach themselves
- b) the process by which the surplus neurotransmitters are reabsorbed back into the sending neuron
- c) a chemical that mimics the effects of a neurotransmitter
- d) a chemical that blocks the effect of a neurotransmitter

**ANS: B, p. 48, F, (2)**

Section: Brain Circuits: Making Connections

38. Isabella is putting mustard on her hot dog. She realizes she has put too much and sucks up some of it back into the squeeze bottle. This process is similar to

- a) the action potential.
- b) receptor site bindings.
- c) binding specificity.

*Incorrect. Binding specificity refers to the fact that receptor sites are designed to receive only one specific neurotransmitter.*

- d) reuptake.

*Correct. Reuptake occurs when excess neurotransmitters are reabsorbed into the sending neuron.*

**ANS: D, p. 48, C, (3)**

Section: Brain Circuits: Making Connections

39. \_\_\_\_\_ neurotransmitters make it more likely that a neuron will send its message to other neurons, whereas \_\_\_\_\_ neurotransmitters make it less likely that a neuron will send its message.

- a) Excitatory; inhibitory

*Correct. Excitatory neurotransmitters turn cells on and inhibitory ones turn cells off.*

- b) Inhibitory; excitatory

*Incorrect. Inhibitory neurotransmitters turn cells off and excitatory ones turn cells on.*

- c) Augmentation; depletion
- d) Depletion; augmentation

**ANS: A, p. 48, C, (2)**

Section: Brain Circuits: Making Connections

**% correct 89 a= 89 b= 8 c= 3 d= 0 r = .48**

40. Agonist is to antagonist as \_\_\_\_\_.

- a) neuromodulator is to neurotransmitter.
- b) reuptake is to receptor.
- c) mimic is to block.

*Correct. Agonists mimic neurotransmitters by stimulating specific receptor sites, and antagonists block receptor sites.*

- d) block is to mimic.

*Incorrect. This is the opposite of the correct answer.*

**ANS: C, p. 49, C, (2)**

Section: Brain Circuits: Making Connections

41. Jill has recently been prescribed L-Dopa to treat her condition. Jill most likely has which of the following?

- a) Parkinson's disease

*Correct. L-Dopa is used to treat Parkinson's disease, which involves a deficit of the neurotransmitter dopamine.*

- b) major depression

*Incorrect. L-Dopa would have no clinical application for major depressive disorder.*

- c) Alzheimer's disease
- d) generalized anxiety disorder

**ANS: A, p. 49, A, (2)**

Section: Brain Circuits: Making Connections

42. Which of the following is the most accurate statement regarding the relationship between neural cells and glial cells?

- a) Neurons and glia influence each other in mutually beneficial ways.

*Correct. As your authors point out, neurons and glia influence each other in complex but mutually beneficial ways.*

- b) Glia exist solely to support neurons. Neurons do not influence glia.

*Incorrect. This is incorrect, because neurons do affect glial cells in beneficial ways.*

- c) Neurons exist solely to support glia. Glia do not influence neurons.
- d) Glia and neurons are both assisted/aided by oligodendrocytes; however, neurons and glia do not have any direct interaction with each other.

**ANS: A, p. 49, C, (3)**

Section: Brain Circuits: Making Connections

43. There are approximately how many glial cells in the brain relative to the number of neurons?

- a) half as many glial cells relative to the number of neurons
- b) approximately the same number of glial cells relative to the number of neurons
- c) about ten times more glial cells relative to the number of neurons
- d) about 100 times more glial cells relative to the number of neurons

**ANS: C, p. 49, F, (1)**

Section: Brain Circuits: Making Connections

44. The brain and spinal cord are two components of the \_\_\_\_\_.

- a) central nervous system

*Correct. The brain and spinal cord are two components of the central nervous system.*

- b) somatic nervous system
- c) peripheral nervous system

*Incorrect. The two components of the peripheral nervous system are the autonomic and somatic nervous systems.*

- d) autonomic nervous system

**ANS: A, pp. 50 & 52, F, (1)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 100 a= 100 b= 0 c= 0 d= 0 r = .00**

45. The central nervous system consists of \_\_\_\_\_.

- a) the parasympathetic and sympathetic divisions

*Incorrect. These are divisions of the autonomic nervous system.*

- b) the brain and spinal cord

*Correct. The brain and spinal cord are the two most basic components of the central nervous system.*

- c) muscles and glands
- d) sense organs and sensory neurons

**ANS: B, pp. 50 & 52, F, (1)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 77 a= 17 b= 77 c= 0 d= 6 r = .24**

46. Involuntary muscles are controlled by the \_\_\_\_\_ nervous system.

- a) somatic

*Incorrect. The somatic nervous system controls voluntary muscles.*

- b) autonomic

*Correct. The autonomic nervous system controls involuntary muscles like the heart, stomach, and intestines.*

- c) sympathetic
- d) parasympathetic

**ANS: B, p. 51, F, (1)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 64 a= 14 b= 64 c= 14 d= 9 r = .27**

47. The peripheral nervous system consists of the \_\_\_\_\_.

- a) brain and the sensory-somatic nervous system
- b) spinal cord and the sensory-somatic system
- c) brain and the autonomic nervous system
- d) autonomic nervous system and the sensory-somatic nervous system

**ANS: D, p. 51, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

48. The autonomic nervous system can be further subdivided into \_\_\_\_\_.

- a) the sympathetic and sensory-somatic systems

- b) the peripheral and semi-peripheral systems
- c) the sympathetic and parasympathetic systems
- d) the sympathetic and peripheral systems

**ANS: C, p. 51, F, (1)**

Section: The Nervous System: An Orchestra With Many Members

49. Which component of the nervous system mobilizes the body in times of stress?

- a) central
- b) somatic
- c) sympathetic
- d) parasympathetic

*Correct. The sympathetic nervous system mobilizes the body in times of stress.*

- d) parasympathetic

*Incorrect. The parasympathetic nervous system restores the body to normal functioning after arousal.*

**ANS: C, p. 51, C, (2)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 60 a= 8 b= 12 c= 60 d= 20 r = .37**

50. As Molly is walking across campus, a car swerves toward her. Her heart races and sweat breaks out as she jumps out of harm's way. This mobilization of energy is due to the action of Molly's \_\_\_\_\_.

- a) somatic nervous system
- b) skeletal nervous system
- c) parasympathetic nervous system
- d) sympathetic nervous system

*Incorrect. The parasympathetic nervous system restores the body to normal functioning after arousal.*

- d) sympathetic nervous system

*Correct. The sympathetic nervous system is responsible for reacting to stressful events and bodily arousal.*

**ANS: D, p. 51, A, (2)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 73 a= 11 b= 0 c= 16 d= 73 r = .48**

**% correct 81 a= 11 b= 0 c= 9 d= 81 r = .51**

51. Which of the following is associated with the sympathetic branch of the autonomic nervous system?

- a) reduced heart rate
- b) contraction of pupils
- c) decreased sweat
- d) decreased salivation

**ANS: D, p. 51, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

52. The autonomic nervous system has two divisions called the \_\_\_\_\_ and the \_\_\_\_\_.

- a) central; peripheral

*Incorrect. The two divisions of the autonomic nervous system are the sympathetic and parasympathetic nervous systems.*

- b) sympathetic; parasympathetic

*Correct. These are the divisions of the autonomic nervous system.*

- c) receptors; effectors
- d) limbic; endocrine

**ANS: B, pp. 51–52, F, (1)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 96 a= 4 b= 96 c= 0 d= 0 r = .19**

53. The division of the nervous system that allows the brain and the spinal cord to communicate with the sensory systems of the eyes, ears, skin, and mouth and allows the brain and spinal cord to control the muscles and glands of the body is called the \_\_\_\_\_.

- a) peripheral nervous system

*Correct. The peripheral nervous system allows the brain and spinal cord to communicate with the sensory systems and control the muscles and glands.*

- b) central nervous system

*Incorrect. The peripheral nervous system enables the central nervous system, which consists of the brain and spinal cord, to communicate with the sensory systems and control the muscles and glands.*

- c) endocrine system
- d) secondary nervous system

**ANS: A, pp. 51–53, C, (1)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 69 a= 69 b= 22 c= 7 d= 1 r = .43**

54. The parasympathetic branch of the autonomic nervous system is responsible for which of the following?

- a) increased heart rate
- b) dilation of pupils
- c) increased salivation
- d) decreased digestion

**ANS: C, p. 52, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

55. Every deliberate action you make, such as pedaling a bike, walking, scratching, or smelling a flower, involves neurons in the \_\_\_\_\_ nervous system.

- a) sympathetic
- b) sensory-somatic

*Correct. The sensory-somatic nervous system controls voluntary muscle movement.*

- c) parasympathetic
- d) autonomic

*Incorrect. The autonomic nervous system consists of nerves that control all of the involuntary muscles, organs, and glands.*

**ANS: B, p. 52, A, (2)**

Section: The Nervous System: An Orchestra With Many Members

56. As she walks out of the living room, Gloriann turns out the light. In this example, Gloriann's \_\_\_\_\_ is active.

- a) sympathetic nervous system
- b) parasympathetic nervous system
- c) autonomic nervous system

*Incorrect. Turning out the light requires voluntary muscle movement.*

- d) somatic nervous system

*Correct. Turning out the light requires voluntary muscle movement.*

**ANS: D, p. 52, A, (2)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 48 a= 8 b= 14 c= 30 d= 48 r = .42**

57. The sensory-somatic nervous system is one branch of the \_\_\_\_\_ nervous system.

- a) sympathetic
- b) parasympathetic
- c) peripheral
- d) central

**ANS: C, p. 52, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

58. Which of the following is a long bundle of neurons that functions as a carrier of messages from the body to the brain and from the brain to the body and is responsible for certain reflexes?

- a) spinal cord

*Correct. The spinal cord carries messages to and from the body to the brain.*

- b) cerebellum
- c) somatic nervous system

*Incorrect. The somatic nervous system carries information from the senses to the central nervous system (CNS) and from the CNS to voluntary muscles of the body.*

- d) amygdala

**ANS: A, p. 52, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 77 a= 77 b= 2 c= 19 d= 2 r = .29**

59. How many pairs of spinal nerves stem from the spinal cord?

- a) 30
- b) 31
- c) 32
- d) 33

**ANS: B, p. 52, F, (3)**

Section: The Nervous System: An Orchestra With Many Members

60. A reflex involves which of the following type(s) of neurons?

- a) sensory, interneurons, and motor
- b) motor

- c) interneurons
- d) sensory

**ANS: A, pp. 52–53, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

61. Why do many reflexes, such as pulling your hand away from a hot iron, happen so quickly?

- a) They involve the neurotransmitter GABA rather than dopamine.
- b) The message involved does not have to go all the way to the brain.

*Correct. The message goes to the central area of the spinal cord and not up to the brain.*

- c) The speed of processing is faster in the frontal lobes than in the occipital lobes.
- d) The path that reflexes follow to the brain is direct and does not involve any neurotransmitters.

*Incorrect. The message involved does not have to go all the way to the brain.*

**ANS: B, pp. 52–53, C, (3)**

Section: The Nervous System: An Orchestra With Many Members

**% correct 70 a= 0 b= 70 c= 0 d= 30 r = .19**

62. If you were to play a very dangerous (and somewhat gruesome) game and saw part of your skull off and look at your now well-ventilated brain in a mirror, the first structure(s) you would see under the skull will be the \_\_\_\_\_.

- a) corpus callosum

*Incorrect. The corpus callosum is a thick band of axons that connects the two cerebral hemispheres.*

- b) meninges

*Correct. There are three different meninges that cover the brain, and they are visible directly under the scalp.*

- c) ventricle
- d) gyrus

**ANS: B, p. 53, A, (2)**

Section: The Nervous System: An Orchestra With Many Members

63. Your occipital lobe is located \_\_\_\_\_.

- a) below the temples
- b) at the back of the brain
- c) immediately behind the forehead
- d) under the corpus callosum

**ANS: B, p. 53, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

64. Which of the following is one of the lobes of the human brain?

- a) cruciate
- b) anterior
- c) occipital
- d) cerebellar

**ANS: C, pp. 53–54, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

65. The two halves of the brain are connected by the \_\_\_\_\_.
- a) cerebral hemisphere
  - b) sulcus
  - c) corpus callosum
  - d) cerebral cortex

**ANS: C, p. 54, F, (1)**

Section: The Nervous System: An Orchestra With Many Members

66. The thick band of neurons that connects the right and left cerebral hemispheres is called the \_\_\_\_\_.
- a) cortex

*Incorrect. The cortex is the outermost part of the brain.*

- b) cerebrum
- c) corpus callosum

*Correct. The corpus callosum connects the right and left cerebral hemispheres.*

- d) cerebellum

**ANS: C, p. 54, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 90 a= 3 b= 1 c= 90 d= 5 r = .51**

**% correct 81 a=0 b= 4 c= 81 d= 15 r = .54**

67. The chief function of the occipital lobe is concerned with \_\_\_\_\_.
- a) motor control
  - b) hearing
  - c) memory
  - d) vision

**ANS: D, p. 55, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

68. Which of the following regions contains the primary centers for processing visual data?

- a) the occipital lobe
- b) the parietal lobe
- c) the temporal lobe
- d) the frontal lobe

**ANS: A, p. 55, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

69. After a head injury a person reports that she is unable to see, although her eyes are uninjured. A doctor would suspect an injury in the \_\_\_\_\_ lobe.

- a) occipital

*Correct. The occipital lobes contain the visual centers of the brain.*

- b) parietal

*Incorrect. The parietal lobes contain the somatosensory cortex, not the visual centers.*

- c) temporal
- d) frontal

**ANS: A, p. 55, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

70. Suzie Q. was rollerblading when a cat jumped right in front of her, causing her to fall. She landed on the back of her head at which point she saw “stars.” Which lobe would have been most affected by this fall given what she saw?

- a) frontal
- b) temporal

*Incorrect. The temporal lobe is not involved in visual processing, so it would not be the best answer to this question.*

- c) parietal
- d) occipital

*Correct. If Susie is having an artificial visual experience, it is due to trauma to her occipital lobe.*

**ANS: D, p. 55, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

71. The temporal lobe is involved in which of the following functions?

- a) processing of touch
- b) expression of language
- c) storing new information into memory
- d) recognizing various visual properties such as motion

**ANS: B, p. 55, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

72. The part of the brain located just behind the temples, containing neurons responsible for the sense of hearing and meaningful speech, is called the \_\_\_\_\_.

- a) temporal lobes

*Correct. The temporal lobes are responsible for the sense of hearing and meaningful speech.*

- b) parietal lobes

*Incorrect. The parietal lobes are not involved with hearing or speech.*

- c) frontal lobes
- d) occipital lobes

**ANS: A, p. 55, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 72 a= 72 b= 15 c= 8 d= 5 r = .51**

73. Bobby B. was rollerblading when a cat jumped right in front of him, causing him to fall. When he fell, he landed on the side of his head. Shortly afterwards, Bobby complained that he could not understand what people were saying to him. Which lobe would have been most affected by this fall given what he experienced?

- a) frontal
- b) temporal

*Correct. The comprehension of language is one of the many tasks handled by the temporal lobe.*

- c) parietal
- d) occipital

*Incorrect. The occipital lobe is really responsible for visual processing, and does not play any role in the comprehension of language.*

**ANS: B, p. 55, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

74. Suppose Al is trying to recall where he left his keys, Hal is listening to his MP3 player, and Sal is looking at a beautiful painting in an art museum. Which individual is using his parietal lobe?

- a) Al

*Correct. The retrieval of memories like this is handled by the parietal lobe.*

- b) Hal

*Incorrect. Auditory processing is handled by the temporal lobe, not the parietal lobe.*

- c) Sal
- d) Hal and Sal are, but Al is not.

**ANS: A, p. 56, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

75. Which sensory system is generally controlled by the parietal lobes?

- a) touch
- b) vision
- c) hearing
- d) smell

**ANS: A, p. 56, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

76. Darla was in an automobile accident that resulted in an injury to her brain. Her sense of touch has been affected. Which part of the brain is the most likely site of the damage?

- a) frontal lobe
- b) temporal lobe

*Incorrect. The temporal lobes are responsible for the sense of hearing and meaningful speech, not touch.*

- c) occipital lobe
- d) parietal lobes

*Correct. The parietal lobes contain the centers for touch, taste, and temperature.*

**ANS: D, p. 56, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

77. The \_\_\_\_\_ is located right behind the central sulcus.

- a) motor strip
- b) frontal lobe
- c) somatosensory strip
- d) forebrain

**ANS: C, p. 56, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

78. Which of the following is generally handled by the frontal lobes of the brain?

- a) your sense of taste
- b) regulation of sleep cycles
- c) producing speech
- d) reasoning

**ANS: D, p. 57, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

79. Which of the following lobes is involved in planning, memory, and personality?

- a) temporal lobes

*Incorrect. This part of the brain is responsible for the sense of hearing and meaningful speech, not planning, memory, or personality.*

- b) parietal lobes
- c) frontal lobes

*Correct. The frontal lobes are involved in planning, memory, and personality.*

- d) occipital lobes

**ANS: C, p. 57, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 70 a= 11 b= 0 c= 70 d= 18 r = .30**

80. Warren is having trouble deciding what he wants to eat for breakfast. Which lobe of his brain is especially active as he makes his selection?

- a) temporal

*Incorrect. This part of the brain is responsible for the sense of hearing and meaningful speech.*

- b) parietal
- c) frontal

*Correct. The frontal lobes are responsible for decision-making skills.*

- d) occipital

**ANS: C, p. 57, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 64 a= 10 b= 21 c= 64 d= 5 r = .42**

81. Joella was rollerblading when a cat jumped right in front of her, causing her to trip and fall. When she fell, she partially landed on the front side of her head near her forehead. Shortly afterwards, Joella exhibited symptoms similar to that of Phineas Gage. Which lobe would have been most affected by this fall?

- a) frontal

*Correct. Phineas Gage suffered extreme trauma to the frontal lobe of his brain, impacting all sorts of functions including his personality.*

- b) temporal

*Incorrect. The famous story of Phineas Gage gave us insight into the functioning of the frontal lobe of the brain.*

- c) parietal
- d) occipital

**ANS: A, p. 57, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

82. Phineas Gage tragically had a tamping iron propelled through his head. Both left and right sides of the prefrontal cortex were severely damaged. As a result of the accident, Phineas Gage \_\_\_\_\_.

- a) died from his injuries
- b) suffered loss of his arms and legs
- c) lost his sense of hearing

*Incorrect. Hearing is handled by the temporal lobe, not the frontal lobe of the brain.*

- d) suffered a change in personality

*Correct. After Phineas Gage's accident, his personality changed dramatically.*

**ANS: D, p. 57, A, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

83. Ito was driving through a rough part of town late at night when a stray bullet hit the front side of his head. Both the left and right sides of his prefrontal cortex were severely damaged. As a result of the accident, Ito most likely \_\_\_\_\_.

- a) died from his injuries
- b) suffered loss of his arms and legs
- c) lost his sense of hearing

*Incorrect. Damage to the temporal lobe would be most likely to lead to auditory impairments.*

- d) suffered a change in personality

*Correct. Personality changes could be a result of damage to the frontal lobes of the brain, as in the famous case of Phineas Gage.*

**ANS: D, p. 57, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

84. Ever since Zack suffered a brain injury by falling from a ladder, his wife has continued to tell the doctor that his personality has changed. He used to be fun loving and carefree, but he is now more critical and yells at his children for seemingly little reason. Zack is likely to have suffered damage to the \_\_\_\_\_ of his cortex.

- a) occipital lobe

*Incorrect. If his vision was affected, this would be accurate.*

- b) parietal lobe
- c) temporal lobe
- d) frontal lobe

*Correct. The frontal lobes are connected to personality and decision making processes.*

**ANS: D, p. 57, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

85. Since Norma is a split-brain patient, we can infer that she likely has a history of \_\_\_\_\_.

- a) mental illness
- b) severe epilepsy

*Correct. One of the very few medical conditions that split brain procedure is used to treat is severe epilepsy.*

- c) anosognosia
- d) frontal lobe damage

*Incorrect. Split brain procedures are not used to treat the frontal lobe damage; in fact, it would make no sense at all to use this procedure for this type of medical problem.*

**ANS: B, p. 57, A, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

86. Pat has decided to undergo surgery to treat her severe epilepsy. Consequently, her doctors will use a surgical procedure during which they will sever her \_\_\_\_\_.

- a) parietal lobe
- b) corpus callosum

*Correct. The corpus callosum is the thick band of axons that connects the left and right cerebral hemispheres. It is what is severed during a split brain procedure to treat severe epilepsy.*

- c) cerebral cortex
- d) subcortical structure

*Incorrect. In order to treat severe epilepsy, the corpus callosum is cut in a split brain procedure. This is a last treatment effort and is only done in the most serious cases.*

**ANS: B, p. 57, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

87. In trying to determine whether the left hemisphere constructs stories to “fill in gaps” in its knowledge, Gazzaniga and LeDoux (1978) used all of the following techniques in their case study except \_\_\_\_\_.

- a) presenting a picture of a snow scene and a chicken’s claw simultaneously to the right hemisphere

*Correct. This was not one of the procedures executed in this research.*

- b) showing several other pictures and choosing which of them was implied by the stimulus
- c) asking the patient what he had seen and why he had made the selections

*Incorrect. This was a very important part of Gazzaniga and LeDoux’s research.*

- d) having the patient use his right hand to select a picture of a chicken, and his left hand to select a picture of a shovel

**ANS: A, p. 58, C, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

88. The study by Gazzaniga and LeDoux (1978) reviewed in your text was conducted to address which of the following general issues?

- a) the role of the frontal lobe in auditory processing
- b) the role of the parietal lobe in visual processing

*Incorrect. This statement would be inaccurate, because the parietal lobe is not involved in visual processing.*

c) the practical effects of the division of the brain into two hemispheres

*Correct. This research was designed to find out exactly what the differential responsibilities of the two cerebral hemispheres are.*

d) the difference between right- and left-handedness in processing spatial information

**ANS: C, p. 58, C, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

89. Traditionally, many have made the analogy that the left brain is to the right brain as \_\_\_\_\_.

a) analytical is to perceptual

*Correct. Though recent research suggests that this analogy may not be completely accurate, it is what most people have believed about the brain for many years.*

b) verbal is to analytical

c) intuitive is to perceptual

*Incorrect. Traditionally, the left brain has been thought of as analytical, and the right has been thought of as perceptual.*

d) intuitive is to analytical

**ANS: A, p. 58, C, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

90. The forebrain includes the \_\_\_\_\_.

a) medulla

b) hippocampus

c) pons

d) reticular activating system

**ANS: B, p. 58, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

91. Subcortical brain structures are primarily located \_\_\_\_\_.

a) directly above cortical brain structures

b) directly behind cortical brain structures

c) deep beneath the cortex

d) within the right hemisphere near cortical brain structures

**ANS: C, p. 58, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

92. The thalamus could be thought of as being analogous to a(n) \_\_\_\_\_.

a) airline hub

*Correct. If you think of an airline hub as being the place where planes go before they depart for their final destination, you will see the analogy to the thalamus.*

b) speedway

c) police station

d) bus stop

*Incorrect. This analogy does not work, because all people at the bus stop get on the same bus that goes to the same place. The thalamus routes sensory information to the correct part of the cerebrum for processing.*

**ANS: A, p. 59, C, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

93. The thalamus is often compared to a(n) \_\_\_\_\_.

a) switching center

*Correct. As your authors note, the thalamus is often compared with a switching center because it routes sensory information to different parts of the cerebral cortex.*

b) fast food menu

*Incorrect. There is really nothing about this answer that could be considered correct.*

c) stop sign

d) bus stop

**ANS: A, p. 59, C, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

94. What part of the brain acts as a relay station for incoming sensory information?

a) hypothalamus

*Incorrect. The hypothalamus regulates sleep, hunger, thirst, and sex.*

b) thalamus

*Correct. The thalamus acts as a relay station.*

c) cerebellum

d) pituitary gland

**ANS: B, p. 59, C, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 48 a= 19 b= 48 c= 25 d= 8 r = .53**

**% correct 48 a= 22 b= 48 c= 22 d= 8 r = .48**

95. The hypothalamus is located \_\_\_\_\_ the thalamus.

a) above

b) under

c) to the right of

d) to the left of

**ANS: B, p. 59, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

96. The hypothalamus controls which of the following functions?

a) balance

b) sleeping

c) governing sexual behavior

d) allowing new information to be stored in memory

**ANS: C, p. 59, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

97. Eating, drinking, sexual behavior, sleeping, and temperature control are most strongly influenced by the \_\_\_\_\_.

a) hippocampus

b) thalamus

*Incorrect. The thalamus acts as a relay station for incoming sensory information and is not involved in eating, drinking, sexual behavior, sleeping, and temperature control.*

c) hypothalamus

*Correct. The hypothalamus regulates sleep, hunger, thirst, and sex.*

d) amygdala

**ANS: C, p. 59, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 50 a= 12 b= 24 c= 50 d= 14 r = .21**

**% correct 59 a= 8 b= 11 c= 59 d= 22 r = .32**

98. The subcortical structure that is key in allowing us to enter new information into the brain's memory banks is called the \_\_\_\_\_.

a) medulla

b) amygdala

c) hippocampus

d) pons

**ANS: C, p. 59, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

99. The \_\_\_\_\_ is the part of the brain responsible for the formation of long-term memories.

a) hippocampus

*Correct. The hippocampus is responsible for the formation of long-term memories.*

b) hypothalamus

*Incorrect. The hypothalamus regulates sleep, hunger, thirst, and sex and is not involved in memory.*

c) fornix

d) amygdala

**ANS: A, pp. 59–60, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 59 a= 59 b= 19 c= 0 d= 22 r = .45**

100. After a blow to the head, John (like the patient "H.M.") had great difficulty learning new facts, indicating potential damage to the \_\_\_\_\_.

a) thalamus

b) hypothalamus

*Incorrect. Some research suggests that the hypothalamus plays a minor role in memory, but the best answer to this question is the hippocampus.*

c) hippocampus

*Correct. The famous case of H.M. demonstrated the memory responsibilities of the hippocampus.*

d) amygdala

**ANS: C, pp. 59–60, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

101. Which of the following is a group of several brain structures located under the

cortex and involved in learning, emotion, memory, and motivation?

- a) limbic system

*Correct. This structure is involved in learning, memory, emotion, and motivation.*

- b) cerebellum
- c) cerebral cortex
- d) cerebrum

*Incorrect. The cerebrum consists of the cerebral hemispheres and connecting structures.*

**ANS: A, pp. 59-60, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 54 a= 54 b= 14 c= 20 d= 12 r = .29**

102. The structures of the limbic system play an important role in \_\_\_\_\_ and \_\_\_\_\_.

- a) heart rate; breathing
- b) breathing; decision making
- c) memory; emotion

*Correct. These structures play a role in memory and emotion.*

- d) spatial tasks; sequential tasks

*Incorrect. The limbic system does not play an important role in these tasks.*

**ANS: C, pp. 59-60 F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 58 a= 28 b= 5 c= 58 d= 8 r = .30**

**% correct 44 a= 26 b= 22 c=44 d= 7 r = .40**

103. The amygdala plays a particularly important role in the emotions of \_\_\_\_\_.

- a) happiness and sadness
- b) anger and fear
- c) surprise and disgust
- d) grief and love

**ANS: B, p. 60, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

104. Stan has been extremely afraid of cats since he was scratched as a 5-year-old. Whenever he sees a cat, he remembers the time he was scratched across his face and starts to feel afraid. If a cat comes towards him, he often runs away immediately as he is afraid of being scratched again. Stan's behaviors and recollection of this trauma is a result of the \_\_\_\_\_ in the limbic system.

- a) hippocampus
- b) thalamus
- c) amygdala

*Correct. This is the part of the brain which controls many fear responses and memories.*

- d) medulla

*Incorrect. The medulla is responsible for critical life functions, such as breathing and circulation.*

**ANS: C, p. 60, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

105. As Joe walks to his car late at night, he hears footsteps behind him. Feeling afraid, Joe grips his keys and quickens his pace. It is likely that Joe's \_\_\_\_\_ has been activated.

a) hypothalamus

*Incorrect. The hypothalamus would be responsible for activating the fight or flight system, but only after the amygdala interpreted a fearful or threatening response.*

b) hippocampus

c) amygdala

*Correct. The amygdala processes the emotions of anger and fear.*

d) cerebellum

**ANS: C, p. 60, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

106. Which of the following subcortical structures plays a role in the formation of a habit?

a) hypothalamus

b) basal ganglia

c) amygdala

d) hippocampus

**ANS: B, p. 60, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

107. The set of neural structures at the base of the brain that transmit and receive information from the spinal cord are collectively referred to as the \_\_\_\_\_.

a) brain stem

b) midbrain

c) hindbrain

d) limbic system

**ANS: A, p. 61, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

108. Which of the following subcortical structures is a part of the brainstem?

a) medulla

b) hypothalamus

c) thalamus

d) hippocampus

**ANS: A, p. 61, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

109. The \_\_\_\_\_ is a structure in the brain stem responsible for life-sustaining functions, such as breathing and heart rate.

a) reticular activating system

b) pons

*Incorrect. The pons plays a role in sleep, dreaming, left–right body coordination, and arousal.*

c) medulla

*Correct. The medulla is responsible for life-sustaining functions.*

d) cerebellum

**ANS: C, p. 61, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 59 a= 3 b= 19 c= 59 d= 18 r = .27**

110. An auto accident rendered Chris's nervous system unable to send messages for him to breathe, so he is on a respirator. Which brain structure was damaged in the accident?

a) pons

*Incorrect. The pons plays a role in sleep, dreaming, left-right body coordination, and arousal.*

b) medulla

*Correct. The medulla is responsible for breathing.*

c) cerebellum

d) reticular formation

**ANS: B, p. 61, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 48 a= 10 b= 48 c= 37 d= 5 r = .22**

111. A college student is having difficulty staying awake during the day and sleeping through the night. Her difficulties are MOST likely due to problems in the \_\_\_\_\_.

a) hippocampus

*Incorrect. The hippocampus is responsible for the formation of long-term memory and does not play a role in keeping people awake and alert.*

b) pons

*Correct. The pons plays a role in sleep, dreaming, and arousal.*

c) medulla

d) cerebellum

**ANS: B, p. 61, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 44 a= 15 b=44 c= 25 d= 16 r = .22**

112. What is the main function of the reticular formation?

a) to control thinking

b) to regulate emotions

c) to control levels of alertness

*Correct. The reticular formation controls levels of alertness.*

d) to coordinate involuntary rapid fine-motor movements

*Incorrect. This is the role of the cerebellum.*

**ANS: C, p. 61, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 37 a= 3 b= 30 c= 37 d= 30 r = .20**

113. If a person is described as "punch-drunk," then it is quite likely that he or she is \_\_\_\_\_.

- a) suffering the effects of chronic alcohol consumption
- b) delirious due to addiction furthered by the nucleus accumbens
- c) suffering from sleep deprivation due to damage to the pons

*Incorrect. As your authors point out, the term punch-drunk often refers to somebody who has received serious and repeated head trauma resulting in damage to the cerebellum.*

- d) an aging prizefighter with damage to the cerebellum

*Correct. Repeated trauma to the brain can cause damage to the cerebellum, which will result in difficulties with motor coordination or balance.*

**ANS: D, p. 61, A, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

114. Jennifer has been diagnosed with spinocerebellar degeneration. The first stage of the disease involves tremors and unsteady gate. In the later stages, she will be unable to stand or walk and will be uncoordinated in her movements. This disease affects the \_\_\_\_\_.

- a) hippocampus
- b) amygdala
- c) cerebellum

*Correct. This is the part of the brain which is affected by this disease based on these symptoms.*

- d) hypothalamus

*Incorrect. These symptoms do not indicate a hypothalamic compromise.*

**ANS: C, p. 61, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

115. If your \_\_\_\_\_ was damaged, you might walk oddly and have trouble standing normally.

- a) pons
- b) medulla

*Incorrect. The tool is responsible for life-sustaining functions like respiration and circulation.*

- c) cerebellum

*Correct. The cerebellum is responsible for balance and fine motor coordination.*

- d) amygdala

**ANS: C, p. 61, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

116. According to the authors, the brain has a total of \_\_\_\_\_ mechanisms that allow the brain to communicate with the body.

- a) two
- b) three
- c) four
- d) five

**ANS: C, p. 61, F, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

117. Endocrine glands \_\_\_\_\_.

- a) secrete hormones directly into the bloodstream

*Correct. Endocrine glands do secrete hormones.*

- b) are chemicals released into the bloodstream

*Incorrect. Glands are not chemicals; they are organs that secrete chemicals.*

- c) are an extensive network of specialized cells

- d) are a thin layer of cells coating the axons

**ANS: A, p. 62, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

**% correct 91 a= 91 b= 5 c= 2 d= 2 r = .56**

118. Joe is very anxious over an upcoming exam. Consequently, his adrenal glands will probably produce \_\_\_\_\_.

- a) more testosterone

- b) less estrogen

*Incorrect. Nothing about Joe's circumstance would result in a change in production of estrogen.*

- c) more cortisol

*Correct. Stressful or tense situations cause the HPA axis to produce more cortisol in the adrenal glands.*

- d) less cortisol

**ANS: C, p. 62, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

119. The idea that the pituitary gland is the “master gland” \_\_\_\_\_.

- a) is completely accurate and appropriate

*Incorrect. The pituitary gland is controlled by the hypothalamus, so to suggest that calling it the master gland is completely accurate is something of a misnomer.*

- b) is completely inaccurate since it doesn't control any other glands or related structures

- c) is true; yet, it is still controlled by the brain

*Correct. The pituitary gland can be thought of as the master of the endocrine system, but it is still controlled by the hypothalamus in the brain.*

d) is a matter of debate because many other researchers refer to the adrenal gland as the “master gland”

**ANS: C, p. 62, C, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

120. Which of the following groups of structures work together to help our bodies fight disease?

- a) hippocampus, hypothalamus, and pituitary gland

- b) hypothalamus, pituitary gland, and adrenal glands

- c) hippocampus, medulla, and pituitary gland

- d) basal ganglia, adrenal glands, and pituitary gland

**ANS: B, p. 62, F, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

121. The hypothalamic-pituitary-adrenal (HPA) axis may be activated by which of the following stimuli?

a) leukocytes

*Incorrect. Leukocytes are white blood cells that do not directly impact the HPA axis.*

b) basophils

c) stimulation of the occipital lobe

d) pain

*Correct. Pain can cause the hypothalamus to send messages to the pituitary gland, thus activating the adrenal glands.*

**ANS: D, p. 62, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

122. Research investigating the role of the brain in processing music suggests that \_\_\_\_\_.

a) there is no single “music center” in the brain

b) the left hemisphere houses the “music center”

c) the “music center” is housed within the right parietal lobe

d) the right hemisphere houses the “music center”

**ANS: A, p. 63, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

123. An example of how music affects events at the level of the group is the finding that \_\_\_\_\_.

a) music activates regions in both hemispheres

b) music can improve one’s mood

c) social factors can influence the type of music an individual prefers

d) playing music can relax people

**ANS: C, p. 63, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

124. Imagine that you are motivated to learn how to play the guitar by listening to others, which in turn results in changes in your brain. This scenario best illustrates which of the following levels of analysis?

a) brain and person

b) person and group

*Incorrect. The person and group are affected by music, but so is the level of the brain.*

c) brain, person, and group

*Correct. As your authors point out, all three levels of analysis are affected by music.*

d) brain, person

**ANS: C, pp. 63–64, C, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

125. Evidence indicating the localization of function in the brain was first seen as a result of \_\_\_\_\_.

a) correlational studies

b) naturalistic observation

- c) surveys
- d) accidents

**ANS: D, p. 65, F, (2)**

Section: Probing the Brain

126. If someone has suffered a stroke, then one can infer that the affected region of brain tissue has \_\_\_\_\_.

- a) failed to receive enough oxygen to sustain the neurons in the region

*Correct. A loss of oxygenated blood to certain parts of the brain is what causes a stroke.*

- b) started leaking cerebrospinal fluid
- c) started to heal itself
- d) temporarily become dormant

*Incorrect. Unfortunately, a stroke often results in brain tissue death that is not temporary.*

**ANS: A, p. 65, C, (3)**

Section: Probing the Brain

127. Electroencephalograph is to electroencephalogram as \_\_\_\_\_.

- a) recording is to machine

*Incorrect. This would be the opposite of the correct answer.*

- b) machine is to tracing

*Correct. Electroencephalograph is a machine. That machine produces a tracing called an electroencephalogram.*

- c) brain is to wave
- d) sleep is to awake

**ANS: B, p. 65, C, (3)**

Section: Probing the Brain

128. Small electrodes are pasted onto Miranda's scalp, and they are connected by wire to a machine that translates the electrical energy from her brain into wavy lines on a moving piece of paper. From this description, it is evident that Miranda's brain is being studied through the use of \_\_\_\_\_.

- a) a CT scan

*Incorrect. CT scans take computer-controlled X rays of the brain.*

- b) functional magnetic resonance imaging
- c) a microelectrode
- d) an electroencephalograph

*Correct. Electroencephalographs record brain wave patterns.*

**ANS: D, p. 65, A, (2)**

Section: Probing the Brain

129. Which of the following is a record produced by a machine designed to record the patterns of electrical activity on the surface of the brain?

- a) deep lesioning
- b) ESB

*Incorrect. ESB is insertion of a thin insulated wire into the brain.*

c) EEG

*Correct. EEG records brain wave patterns.*

d) CT scan

**ANS: C, p. 65, F, (1)**

Section: Probing the Brain

130. A microelectrode would be placed into a human's brain \_\_\_\_\_.

a) only after death

b) only in order to treat mental illness

c) during a single-cell recording

d) while an EEG is administered

**ANS: C, p. 66, F, (2)**

Section: Probing the Brain

131. \_\_\_\_\_, or scanning techniques, yield information concerning brain structure and function.

a) Neuroimaging

*Correct. Neuroimaging techniques allow us to get information about the way the brain is structured and functions.*

b) Electroencephalogram

*Incorrect. An electroencephalogram is a graphical representation of the electrical activity in the brain.*

c) Magnetoencephalography

d) Single-cell recording

**ANS: A, p. 66, C, (2)**

Section: Probing the Brain

132. If Mindy's doctor has taken a three-dimensional image of her brain using X rays, then she has likely had a(n) \_\_\_\_\_.

a) EEG

*Incorrect. An electroencephalogram is a graphical representation of the electrical activity in the brain.*

b) MRI

c) CT

*Correct. CT scans use X rays to create such three-dimensional images.*

d) PET

**ANS: C, p. 66, A, (3)**

Section: Probing the Brain

133. Which of the following allows for the visualization of brain structures?

a) EEG

b) MRI

c) PET

d) fMRI

**ANS: B, pp. 66–67, F, (3)**

Section: Probing the Brain

134. A brain-imaging method called \_\_\_\_\_ takes advantage of the magnetic properties of different atoms to take sharp, three-dimensional images of the brain.

- a) electroencephalography (EEG)
- b) magnetic resonance imaging (MRI)

*Correct. MRI is a brain-imaging method using radio waves and magnetic fields of the body.*

- c) positron emission magnetography (PEM)
- d) computed tomography (CT)

*Incorrect. CT scans use X rays.*

**ANS: B, pp. 66–67, C, (1)**

Section: Probing the Brain

135. Ali is in the hospital about to undergo a brain-imaging process that involves taking many X rays from different angles aided by the use of a computer. What type of imaging technique is being used?

- a) electroencephalography (EEG)
- b) magnetic resonance imaging (MRI)

*Incorrect. MRI is a brain-imaging method using radio waves and magnetic fields of the body.*

- c) positron-emission tomography (PET)
- d) computed tomography (CT)

*Correct. CT scans take computer-controlled X rays of the brain.*

**ANS: D, pp. 66–67, A, (2)**

Section: Probing the Brain

**% correct 37 a= 18 b= 42 c= 4 d= 37 r = .30**

136. Rashad is in the hospital and is about to undergo a brain-imaging process that involves placing him inside a magnetic field so that a computer can create three-dimensional images of his brain. What procedure is he about to undergo?

- a) electroencephalography (EEG)
- b) magnetic resonance imaging (MRI)

*Correct. MRI is a brain-imaging method using radio waves and magnetic fields of the body.*

- c) computed tomography (CT)

*Incorrect. CT scans use X rays.*

- d) positron emission tomography (PET)

**ANS: B, pp. 66–67, A, (2)**

Section: Probing the Brain

**% correct 93 a= 4 b= 93 c= 0 d= 4 r = .29**

137. Which of the following allows for the visualization of brain function?

- a) CT
- b) MRI
- c) PET

*Correct. PET scans allow for the creation of an image that shows brain functions.*

d) EEG

*Incorrect. An electroencephalogram is a graphical representation of the electrical activity in the brain.*

**ANS: C, p. 67, C, (2)**

Section: Probing the Brain

138. Functional magnetic resonance imaging detects where more brain activity is occurring by \_\_\_\_\_.

- a) detecting the amount of oxygen that is being brought to a particular place in the brain
- b) where atoms are pulling apart
- c) tracking the path of radiation
- d) simply having a sharp image of the brain

**ANS: A, p. 67, F, (3)**

Section: Probing the Brain

139. \_\_\_\_\_ is a method in which researchers stimulate the brain by putting a wire coil on a person's head and discharging a large current through the coil, thus creating a magnetic field.

- a) TMS
- b) MRI
- c) fMRI
- d) CT

**ANS: A, p. 68, F, (3)**

Section: Probing the Brain

140. The basic premises of Mendelian inheritance were derived after an Augustinian monk observed the characteristics of \_\_\_\_\_ that he bred.

- a) plants

*Correct. Gregor Mendel devised his theories of heritability based on his observation of plants.*

- b) cats
- c) rabbits

*Incorrect. Mendel's work was a result of observation of plants, not animals.*

- d) horses

**ANS: A, p. 70, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

141. Unlike Mendelian inheritance, complex inheritance \_\_\_\_\_.

- a) primarily helps to explain why birth defects occur
- b) describes the effects of individual elements of inheritance

*Incorrect. This would be a statement more applicable to Mendelian inheritance.*

- c) considers the joint combinations of genes working together

*Correct. Complex inheritance suggests that polygenetic inheritance is the best way to understand heritability.*

- d) is unrelated to your genotype

**ANS: C, p. 70, C, (3)**

Section: Genes, Brain, and Environment: The Brain in the World

142. Pruning is to plasticity as \_\_\_\_\_.

- a) flexible is to inflexible
- b) eliminate is to change

*Correct. Pruning refers to the elimination of neurons, while plasticity refers to the brain's ability to change and adapt to various circumstances.*

- c) brain is to neuron
- d) control is to wasted

*Incorrect. There is nothing about this answer that could be considered correct.*

**ANS: B, p. 71, C, (1)**

Section: Genes, Brain, and Environment: The Brain in the World

143. Plasticity is most evident in which of the following circumstances?

- a) during the elderly years

*Incorrect. As your authors point out, plasticity is higher during childhood than in later years.*

- b) when we learn something new or store new information

*Correct. Learning or store new information would cause the brain to change its structure slightly, which demonstrates plasticity.*

- c) when we are trying to undo previous pruning
- d) when reuptake of excess neurotransmitters is taking place

**ANS: B, p. 71, A, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

144. Jack suffered a brain injury as a result of hitting his head while waterskiing. One of the problems that developed was that Jack could not pronounce certain words correctly for a long period of time. He had extensive speech therapy and can now speak as he did before his accident. This is an example of the brain's \_\_\_\_\_ which allowed the structure and function of his brain cells to change to adjust to the trauma.

- a) adaptology
- b) stagnation
- c) plasticity

*Correct. This allowed Jack's brain to adapt after the trauma.*

- d) reflex arc

*Incorrect. Plasticity accounts for Jack's brain to allow him to speak correctly despite damage.*

**ANS: C, p. 71, A, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

145. If a person were to damage the speech center in the brain, the ideal age for this to happen would be \_\_\_\_\_.

- a) 2

*Correct. Plasticity in the brain is maximized during our childhood years, so damage would most likely be adjusted for when the child was young rather than older.*

- b) 14
- c) 33
- d) 61

*Incorrect. The concept of neural plasticity suggests that damage to the speech centers in our later years would not be adapted to by the brain.*

**ANS: A, p. 71, A, (3)**

Section: Genes, Brain, and Environment: The Brain in the World

146. Which of the following statements is true, according to your authors?

- a) Genes are destiny.
- b) Interactions with the environment rarely alter the structure and function of the brain.
- c) Genes are not simply time bombs that are set at birth and ready to explode at the proper hour.

*Correct. As your authors point out, genes and the environment are separate parts of the same system. Therefore seeing genes as being prewired to go off at a certain time is inaccurate.*

- d) The reason why some people go bald is unrelated to genes that are working throughout your life.

*Incorrect. Nothing that your authors have written supports this statement.*

**ANS: C, p. 71, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

147. To say that both genes and environment are important \_\_\_\_\_.

- a) is completely accurate
- b) is completely inaccurate
- c) is partially correct depending on the given person and situation

*Incorrect. Regardless of which person were talking about, the relationship between genes and environment is the same.*

- d) is true, yet it fails to clarify that they are different aspects of a single system

*Correct. Genes and environment are often thought of as being separate systems, but in fact they are different parts of the same system.*

**ANS: D, p. 72, C, (3)**

Section: Genes, Brain, and Environment: The Brain in the World

148. An evocative interaction can be construed as similar to an active interaction in the sense that both show \_\_\_\_\_.

- a) how genetically influenced characteristics draw out behaviors from others
- b) ways that the genes and environment interact

*Correct. An evocative interaction occurs when genetically influenced characteristics induce other people to behave in particular ways.*

- c) what occurs when a parent's or sibling's tendencies produce an environment received by a child

*Incorrect. In a sense, this would be the opposite of the correct answer. An evocative interaction is when genetics influence other people's behaviors.*

d) the effects of when people choose to put themselves in a specific situation or to avoid others

**ANS: B, p. 72, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

149. The term “heritability” is an unfortunate term in the sense that \_\_\_\_\_.

a) it does not indicate the amount of a characteristic or trait that is inherited

*Correct. This is what your authors present as being the problem with this term.*

b) it tells us nothing about how much of the variability in a characteristic in a population is due to genetics

c) it makes the erroneous assumption that genes and the environment are separate factors

*Incorrect. While this is a problem with the study of heritability, it is not specifically related to the term "heritability."*

d) it is quite limited in the number of characteristics it can inform us about

**ANS: A, p. 73, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

150. The amount of genes shared by dizygotic twins is \_\_\_\_\_ as monozygotic twins and \_\_\_\_\_ siblings, respectively.

a) half as much; half as much as

b) twice as much; equal to

c) twice as much; half as much as

d) half as much; equal to

**ANS: D, p. 73, F, (1)**

Section: Genes, Brain, and Environment: The Brain in the World

151. Darwin’s famous term “survival of the fittest” really centers on those who are \_\_\_\_\_.

a) genetically superior

b) successfully reproducing

*Correct. While many people believe that survival of the fittest refers to the strongest animals, Darwin used the term to refer to those who have the greatest reproductive success.*

c) most intelligent

d) physically strongest

*Incorrect. This interpretation of Darwin's work is common, but incorrect.*

**ANS: B, p. 74–75, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

152. The general idea behind the evolution of species \_\_\_\_\_.

a) has not been identified yet

b) is that genes that lead an organism to have offspring, who have still more offspring

*Correct. Evolution of the species suggests that the more children or offspring we have, the better our chance of our genes surviving in the future generations.*

c) is that the physiology of all species is constantly changing

d) is that only those who are the strongest will survive

*Incorrect. This interpretation of Darwin's work is common, but incorrect.*

**ANS: B, p. 74–75, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

### **True/False Questions**

1. Most of the neurons in the brain are referred to as “interneurons.”

**ANS: T, p. 43, F, (1)**

Section: Brain Circuits: Making Connections

2. There are four types of neurons.

**ANS: F, p. 43, F, (1)**

Section: Brain Circuits: Making Connections

3. Because Greg’s hands shake, his limbs often seem frozen in position, and he moves sluggishly with a stooped posture and shuffling walk, he likely has Parkinson’s disease.

**ANS: T, p. 49, A, (2)**

Section: Brain Circuits: Making Connections

4. Your central nervous system consists of three basic structures.

**ANS: F, p. 50 & 52, F, (2)**

Section: The Nervous System: An Orchestra With Many Members

5. The central nervous system is only concerned with getting information into and out of the brain.

**ANS: F, p. 52, C, (2)**

Section: The Nervous System: An Orchestra With Many Members

6. Because Jane has a toothache, she tries to make a conscious effort to stay away from hard foods. This would be an example of a reflex.

**ANS: F, pp. 52–53, A, (2)**

Section: The Nervous System: An Orchestra With Many Members

7. Because the point of reflexes is to get things done in a hurry, the sensory neurons are directly connected to motor neurons.

**ANS: F, pp. 52–53, C, (3)**

Section: The Nervous System: An Orchestra With Many Members

8. The somatosensory strip is located in the parietal lobe.

**ANS: T, p. 56, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

9. Moving your finger activates the somatosensory strip.

**ANS: F, pp. 56–57, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

10. The thalamus is considered a subcortical structure.

**ANS: T, pp. 58–59, F, (1)**

Section: Spotlight on the Brain: How It Divides and Conquers

11. A person with Parkinson’s disease will most likely have an abnormal amygdala.

**ANS: F, p. 60, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

12. Experiencing a traumatic event will likely result in the release of cortisol.

**ANS: T, p. 62, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

13. The adrenal gland is part of the “HPA” axis.

**ANS: T, p. 62, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

14. Events at different levels of analysis interact when it comes to making music.

**ANS: T, p. 63, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

15. Studying brain damage was originally the result of accidents.

**ANS: T, p. 65, F, (1)**

Section: Probing the Brain

16. Damage to the brain often results in a region of impaired tissue called a sulcus.

**ANS: F, p. 65, F, (2)**

Section: Probing the Brain

17. Microelectrodes are used in the technique referred to as single-cell recording.

**ANS: T, p. 66, F, (1)**

Section: Probing the Brain

18. A MRI would allow one to assess brain function.

**ANS: F, pp. 66–67, F, (2)**

Section: Probing the Brain

19. The sum total of your particular set of genes is called your phenotype.

**ANS: F, p. 70, F, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

20. The best description of current theory on the relationship between genes and the environment is that they are two completely independent systems.

**ANS: F, p. 72, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

**Short Answer Questions (9)**

1. List the three types of neurons. Which is most abundant in the brain?

**Answer: Sensory, motor, and interneurons. Interneurons outnumber the other two types.**

**p. 43, F, (2)**

Section: Brain Circuits: Making Connections

2. List in order of reception to release of chemicals four major parts of the neuron.

**Answer: dendrites, cell body, axon, terminal buttons**

**p. 44, A, (2)**

Section: Brain Circuits: Making Connections

3. List the major divisions of the nervous system followed by further subdivisions of each major division. You should end up with a total of six parts.

**pp. 50–52, A, (2)**

**Answer: The nervous system is divided into the central and peripheral nervous systems. The peripheral nervous system is further divided into the sensory-somatic and autonomic nervous systems. The autonomic nervous system is then divided into the parasympathetic and sympathetic divisions.**

Section: The Nervous System: An Orchestra With Many Members

4. If Sam is blind, then he likely has damage to which lobe? Where would that lobe be located?

**Answer: The occipital lobe is responsible for visual processing, and it is located in the back of the brain under the parietal lobe.**

**p. 55, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

5. Briefly state where the frontal lobe is located and its basic functions.

**Answer: The frontal lobe is located toward the front region of the brain and is involved in the following: speech, search for specific memories, reasoning, emotions, and control of motor movement.**

**p. 57, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

6. If Margaret is identified as a split-brain patient, then what condition does she have, and what procedure will have been done?

**Answer: Margaret probably has untreatable epilepsy and thus, her corpus callosum has been severed.**

**p. 57, A, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

7. In terms of the neuroendocrine system, how might the body cope with the extra energy demands of stress?

**Answer: The outer layer of the adrenal glands will produce cortisol, which will ultimately break down protein and fat into sugar, which provides energy to the body.**

**p. 62, C, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

8. Name two hormones that are of particular interest to psychologists and state which gland they are related to and some of the tasks that these hormones perform.

**Answer: The student in this case could cite any two of the hormones listed on page 62 of the textbook, including testosterone and/or estrogen (both of which are listed as being related to the developmental of primary and secondary sexual characteristics) and cortisol (which is listed as being related to stress or traumatic threats). Though the question does not specifically call for it, extra credit might be awarded if the student identifies which gland releases which hormone.**

**p. 62, C, (3)**

Section: Spotlight on the Brain: How It Divides and Conquers

9. Describe three ways in which music affects events at the level of the person based on research reviewed in your text.

**Answer: reduce arousal, calm people who have experienced trauma, and energize older people, improve mood of people who have had brain damage; relax people, which in turn can improve their feelings of well-being**

**p. 63, F, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

10. Briefly compare and contrast MRI with fMRI.

**Answer: Both are neuroimaging techniques. MRI reveals information pertaining to the structure of the brain, whereas an fMRI reveals information pertaining to the function of the brain.**

**pp. 66–67, A, (3)**

Section: Probing the Brain

### Essay Questions

1. Maria is walking on the sidewalk when out of nowhere a car swerves in her direction. Maria's pupils dilate, her heart rate accelerates, and she begins to sweat profusely as she frantically moves away from the car unscathed without fully knowing what has just happened. Bystanders of the event reported that she clearly feared for her life judging by her reaction to the incident. Explain how the various divisions of the nervous system played a role in Maria's reaction.

**Answer: The peripheral nervous system is involved mainly because it is responsible for sending information to and receiving information from the central nervous system. Maria received visual input which started a chain of events once the input reached the brain, or the central nervous system. The sympathetic division of the autonomic nervous is involved in that Maria reacted in a "fight-or-flight" manner.**

**To move out of the way, the sensory-somatic nervous system would have been engaged due to its function in controlling motor movement.**

**pp. 50–52, A, (2)**

Section: The Nervous System: An Orchestra With Many Members

2. Explain how picking up a pencil requires the use of all four lobes of the cerebral cortex.

**Answer: One must first locate the pencil by sight, calling on the occipital lobe. The temporal lobe allows the person to recognize that the object in question is actually a pencil. The parietal lobe allows the person to judge the distance between his/her hand and the pencil. The parietal lobe also houses the somatosensory strip which registers touch, allowing the person to grasp the pencil. The frontal lobe houses the motor cortex, which would be involved in moving one's hand toward the pencil.**

**pp. 55–57, A, (2)**

Section: Spotlight on the Brain: How It Divides and Conquers

3. If you suffered a blow to the head, why might a doctor order both a MRI and fMRI? What does each technique entail? What kind of information does each yield?

**Answer: Suffering a blow to the head might result in both structural and functional damage in the brain. Both techniques might lead to an accurate assessment of such potential damage. An MRI allows for the visualization of brain structure via magnetic properties of atoms. An fMRI allows for the visualization of brain function by determining the amount of oxygen used in various regions of the brain.**

**pp. 66–67, A, (2)**

Section: Probing the Brain

4. Discuss the two core ideas of Mendelian inheritance.

**Answer: Mendelian inheritance examines the transmission of characteristics by individual elements of inheritance, each acting separately. The two core ideas are: 1) for each trait, an offspring inherits an “element” from each parent; and 2) in some cases, one of the elements dominates the other, and that is the one whose effect is apparent. If an element is not dominant, it is recessive. The effect of a recessive element is evident only when the offspring receives two copies of it, one from each parent.**

**p. 70, C, (2)**

Section: Genes, Brain, and Environment: The Brain in the World

5. Define pruning and plasticity. Then, compare and contrast how pruning and plasticity can change the brain as one experiences the world.

**Answer: Pruning is a process whereby certain neural connections are eliminated because certain brain circuits will disappear if they are not used in one's given environment. Plasticity refers to the brain's ability to be molded by experience. It is most evident under the following conditions: during infancy and childhood, when the body changes, when we learn (or store) something new, and as compensation after brain damage.**

**p. 71, C, (3)**

Section: Genes, Brain, and Environment: The Brain in the World

6. Discuss three ways that your genes and environment may influence each other.

**Answer: Passive interaction occurs when the parents' or sibling's genetically-shaped tendencies produce an environment that is passively received by the child. Evocative (or reactive) interaction occurs when genetically-influenced characteristics draw out behaviors from other people. Active interaction occurs when people choose, partly based on genetic tendencies, to put themselves in specific situations and to avoid others.**

**p. 72, A, (2)**

Section: Genes, Brain, and Environment: The Brain in the World