Test Bank for Mastering the World of Psychology A Scientist Practitioner Approach 6th Edition by Wood

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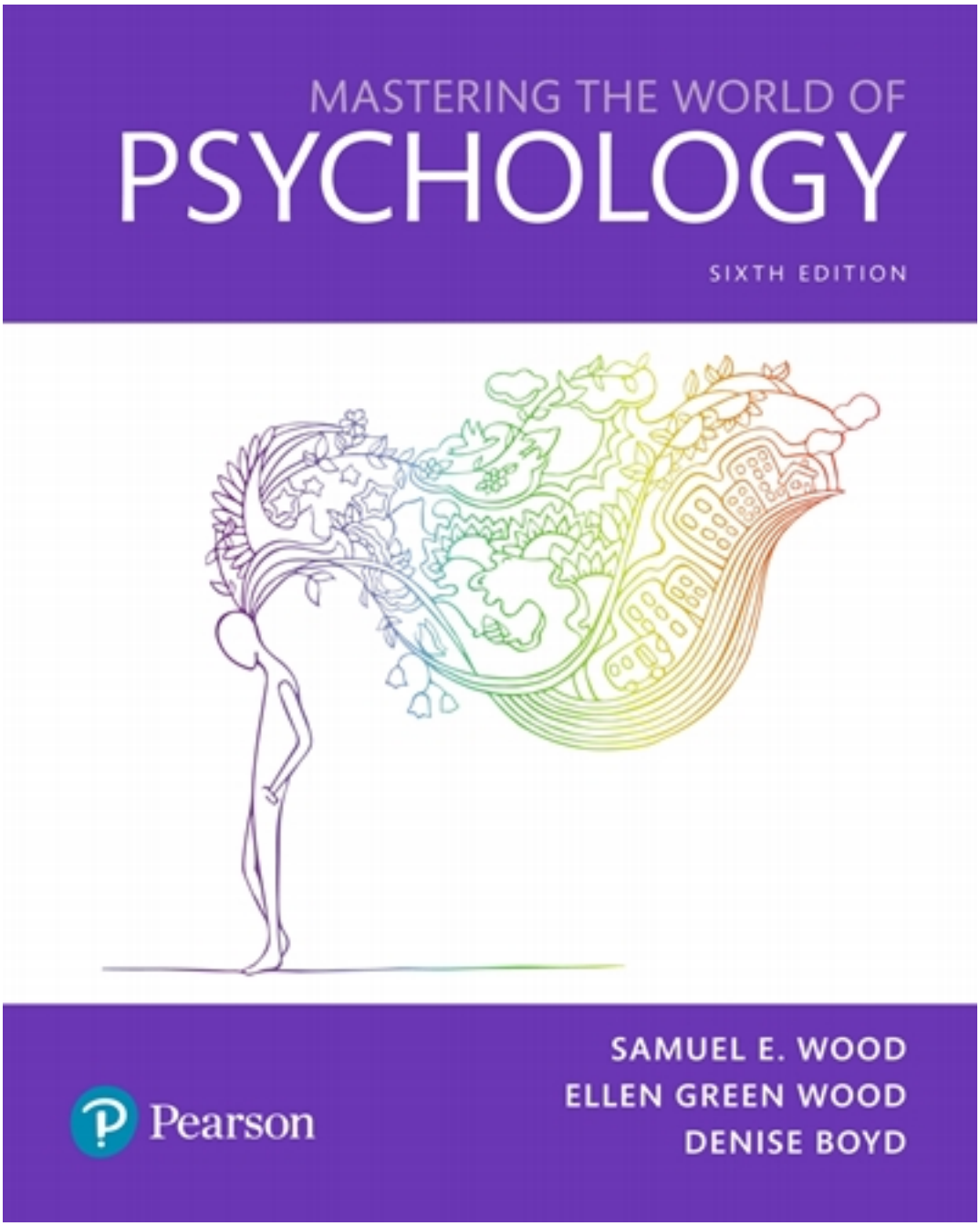

Test Bank

Test Bank for Wood 6e
Chapter 2: Biology and Behavior

Multiple Choice

1. EEG stands for _____
a) Electrical Encoded Graph.
b) encoded encephalogram.
c) electroencephalogram.
d) electro energy gram.
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

2. Which of the following imaging techniques would be best for studying the activity of one single neuron?
a) CT scan
b) PET scan
c) microelectrodes
d) magnetoencephalography
Answer: c
Skill Level: Evaluate
Difficulty: Easy
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

3. The _____ can monitor the activity of a single neuron, or _____ activity within it.
a) microelectrode; stimulate
b) EEG; inhibit
c) microwire; stimulate
d) PET scan; stop
Answer: a
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

4. A record of brain-wave activity is called a (an) _____
a) PET scan.
b) CAT scan.
c) EMG.
d) EEG.

Answer: d
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

5. When wanting a record of electrical activity in the brain in the form of brain waves, a (an) _____ machine would be used.
a) electroencephalogram
b) microelectrode
c) computerized X-ray
d) electrowave spectral imager
Answer: a
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

6. Dr. Solomon wants a record of the electrical activity in her patient's brain during an epileptic seizure. She would schedule the patient for a _____ appointment.
a) magnetic resonance imaging
b) electroencephalograph
c) positron-emission tomography
d) microelectrode testing
Answer: b
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

7. Eight-year-old Daria was having some disturbances in her sleep, so her parents took her to a children's hospital to undergo various tests. She recalls sleeping in the hospital room with a bunch of wires stuck to her scalp. What technique was used in Daria's sleep study?
a) EEG
b) MEG
c) PET
d) SPECT
Answer: a
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

8. Dr. Pardue wants to identify the precise neuronal origin of her patient's epileptic seizures. She will be using a (an) _____ to determine this.
a) iEEG
b) fMRI
c) iPET
d) EEG
Answer: a
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.1.1: Describe what the electroencephalogram (EEG) reveals about the brain
Topic: Discovering the Mysteries of the Nervous System

9. _____ is a brain-scanning technique that uses a rotating, computerized X-ray tube to produce cross-sectional images of the structures of the brain.
a) Positron-emission tomography
b) Computerized axial tomography
c) Functional magnetic resonance imaging
d) Magnetic resonance imaging
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

10. Which of the following uses X-rays to detect various abnormalities of the brain including injury sites, tumors, and evidence of recent strokes?
a) Intracranial EEG
b) Magnetic resonance imaging
c) Computerized axial tomography
d) Electroencephalogram
Answer: c
Skill Level: Evaluate
Difficulty: Easy
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

11. The _____ is a diagnostic scanning technique that produces high-resolution images of the structures of the brain.
a) MRI
b) EEG
c) PET
d) X-ray
Answer: a
Skill Level: Understand
Difficulty: Easy

Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

12. The _____ maps patterns of blood flow, oxygen use, and glucose consumption in the brain.
a) CT scan, computer axial tomography,
b) MRI, magnetic resonance imaging,
c) EEG, electroencephalogram,
d) PET scan, positron-emission tomography,
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

13. The neuroimaging technique SQUID stands for _____
a) super-activated quartz iridium detector.
b) standardized quick-indicating designator.
c) slow-wave quantified injury detector.
d) superconducting quantum interference device.
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

14. The CT scan would be a good choice to look for which of the following?
a) A tumor in the brain
b) Abnormal brain activity
c) A sleep disorder
d) Individual neuron bundles
Answer: a
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

15. Diffusion tensor imaging would be the best choice to examine _____
a) individual neuron bundles.
b) a tumor in the brain.
c) a sleep disorder.
d) glucose uptake in the brain.
Answer: a
Skill Level: Analyze

Difficulty: Difficult
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

16. Conrad brought his mother to the hospital when he noticed she couldn't move one side of her body and had great difficulty speaking. The physician informed Conrad that his mother may have had a stroke. He wanted to confirm this speculation by using an imaging device that utilized X-rays. Which of the following was used on Conrad's mother?
a) MRI
b) CT scan
c) EEG
d) fMRI
Answer: b
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

17. Lucinda needs to find the location of her patient's tumor, but she does not want to expose the patient to X-rays. Which of the following imaging technologies would be best suited for this task?
a) A microelectrode
b) A CT scan
c) A MRI
d) An EEG
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

18. Jessica is a researcher who studies the effects of drug use in humans. She wants to understand the action of particular drugs on the brain. Which of the following imaging techniques will allow her to engage in this type of research?
a) CT scan
b) MRI
c) PET
d) DTI
Answer: c
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

19. _____ are specialized cells that conduct impulses through the nervous system.
a) Gametes
b) Neurons
c) Dendrites
d) Axons
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

20. The body of the cell that carries out the life-sustaining functions of the neuron and contains its nucleus is called the _____
a) soma.
b) dendrite.
c) axon.
d) bud.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

21. The function of the neuron's axon is to _____
a) carry messages to other cells.
b) regulate the neuron's life processes.
c) receive messages from neighboring neurons.
d) insulate against leakage of electrical impulses.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Item Analysis: % correct 67 a = 67 b = 2 c = 35 6 = 53 r = .41
Topic: The Neurons and the Neurotransmitters

22. _____ receive messages from other neurons and _____ send messages to other neurons.
a) Axons; dendrites
b) Axons; soma
c) Soma; glial cells
d) Dendrites; axons
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Item Analysis: % correct 67 a = 67 b = 2 c = 35 6 = 53 r = .41
Topic: The Neurons and the Neurotransmitters

23. The part of a neuron that extends, tail-like, from the soma, and releases neurotransmitters into the synapse is the _____
a) dendrite.
b) glial cell.
c) axon.
d) terminal bud.
Answer: c
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

24. Looking like leafless branches of a tree, the _____ are the primary receivers of signals from other neurons, although the _____ also receives signals directly.
a) axon; dendrites
b) dendrites; soma
c) soma; dendrites
d) dendrites; axon
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

25. If the dendrites of a neuron were not able to perform their function, _____
a) the myelin would shrink.
b) no signals would be transmitted from the neuron.
c) no signals would be received from the neuron.
d) some neural signals would still be received by the neuron.
Answer: d
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

26. If the axon of a neuron were not able to perform its function, _____
a) the neuron would receive no signals.
b) the neuron would send no signals.
c) the neuron would not reproduce.
d) the neuron signals would become erratic.
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

27. Examining the end of an axon, we would see that _____

a) it has many branches, each of which ends in an axon terminal.
b) it has only one terminal.
c) it touches a dendrite or soma of another neuron.
d) it terminates in a myelin sheath.
Answer: a
Skill Level: Understand
Difficulty: Difficult
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

28. Nodes of _____ are gaps in the _____ that coats some axons.
a) myelin; glia
b) Ranvier; myelin
c) membrane; sheath
d) axons; synaptic fluid
Answer: b
Skill Level: Understand
Difficulty: Difficult
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

29. Tony suffers from a disease in which myelin is progressively lost. Tony's axons will increasingly lack _____
a) neurotransmitters.
b) signals.
c) insulation.
d) fluid.
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

30. The tiny gap between an axon's terminals and the dendrites or soma of another neuron is called the _____
a) node of Ranvier.
b) myelin gap.
c) synaptic cleft.
d) neural space.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

31. A presynaptic neuron is the one that is _____ a signal to another neuron.

a) receiving
b) sending
c) coding
d) inhibiting
Answer: b
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

32. When a neuron is at rest, it carries a _____ electrical potential (charge).
a) slightly positive
b) slightly negative
c) neutral
d) massively negative
Answer: b
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

33. The sudden reversal of a neuron's resting potential is called a(n) _____ potential and initiates the _____ of a neuron.
a) firing; action
b) signaling; firing
c) action; firing
d) positive; discharge
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

34. Immediately after firing, a neuron cannot fire for 1 to 2 milliseconds. This is called the _____ period.
a) discharged
b) resting
c) refractory
d) potential
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

35. A neuron has received a signal, causing ion channels to open in the cell membrane, letting positively charged ions flow in. This has caused the membrane potential to change suddenly from –70 to +50 millivolts. This will cause a (an) _____ to occur.
a) resting state
b) action potential
c) negative charge
d) positive charge
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

36. When a neuron carries the electrical potential of _____ millivolts, it is in the state called _____
a) –70; resting potential.
b) +50; refractory period.
c) –50; resting potential.
d) –30; refractory period.
Answer: a
Skill Level: Understand
Difficulty: Difficult
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

37. The strength of the brain's response to a weak or strong stimulus is a result of _____
a) how many and how fast neurons fire.
b) the all or none rule.
c) how many millivolts the neuron has.
d) whether action potential occurs.
Answer: a
Skill Level: Analyze
Difficulty: Difficult
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

38. The most important factor in speeding action potential on its way is the fatty, white coating wrapped around most axons. This is called the _____
a) node of Ranvier.
b) myelin sheath.
c) synaptic fluid.
d) sclerotic coating.
Answer: b

Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

39. Multiple sclerosis results in loss of coordination, jerky movement, muscular weakness, and speech disturbance through the deterioration of _____
a) axons.
b) neurons.
c) myelin.
d) neural membranes.
Answer: c
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

40. The myelin sheath and nodes of Ranvier are important because they _____
a) protect the neuron.
b) speed neural impulses.
c) create action potential.
d) prevent refractory periods.
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

41. Which of the following are tiny sacs in the axon terminal that hold chemicals that are released into the synapse?
a) synaptic vesicles
b) synaptic nodes
c) terminal buttons
d) synaptic gaps
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Item Analysis: % correct 65 a = 65 b = 22 c = 10 d = 3 r = .36
Topic: The Neurons and the Neurotransmitters

42. A chemical found in the sacs within an axon terminal which, when released, has an effect on a nearby neuron is called a _____
a) glial cell.

b) neurotransmitter.
c) precursor cell.
d) synapse.
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Item Analysis: % correct 74 a = 4 b = 74 c = 4 d = 18 r = .34
Topic: The Neurons and the Neurotransmitters

43. When a(n) _____ arrives at the axon terminal, it causes the release of neurotransmitters.
a) precursor
b) receptor
c) action potential
d) node of Ranvier
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

44. Neurotransmitters have distinct molecular shapes; so do the _____ they bind to.
a) myelin sheaths
b) presynaptic neurons
c) vesicles
d) receptors
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

45. Excitatory neurotransmitters influence the receiving neuron to _____, whereas inhibitory neurotransmitters influence the receiving neuron to _____
a) fire; not fire.
b) not fire; fire.
c) move; not move.
d) not move; move.
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

46. Reuptake refers to the process by which neurotransmitters in the synaptic cleft are _____
a) sent back into receptors again.
b) moved back into their axon terminal.
c) broken apart.
d) absorbed by the receiving neuron.
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

47. Running to class, _____ is causing muscle fibers in your leg to contract so you can move, and it will stimulate the neurons you need for learning new information.
a) serotonin
b) dopamine
c) endorphin
d) acetylcholine
Answer: d.
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

48. You just accomplished a goal and rewarded yourself with a delicious treat. The pleasant feelings that result from these behaviors are made possible by the release of _____
a) acetylcholine.
b) GABA.
c) dopamine.
d) epinephrine.
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

49. You just took a tumble and your arm really hurts. You are wishing your brain would release a lot of _____ to help relieve the pain.
a) acetylcholine
b) dopamine
c) serotonin
d) endorphins
Answer: d
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the

brain
Topic: The Neurons and the Neurotransmitters

50. Researchers have identified about _____ substances that are made in our body and brain that act as neurotransmitters.
a) 10
b) 1,000
c) 100
d) 20
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

51. Each neuron may have synapses with _____ other neurons.
a) two or three
b) thousands of
c) up to ten
d) no more than 100
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

52. Whether a neuron fires or not depends on _____
a) whether it is an excitatory neuron.
b) the sum of excitatory and inhibitory neurotransmitters it receives.
c) what type of neurotransmitter the neuron makes.
d) whether the neuron is myelinated or not.
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

53. All of the nerves outside your spinal cord and brain make up the _____
a) central nervous system.
b) sympathetic nervous system.
c) sensory nervous system.
d) peripheral nervous system.
Answer: d
Skill Level: Understand

Difficulty: Easy
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

54. Sensory and motor nerves are part of the _____ nervous system.
a) somatic
b) autonomic
c) sympathetic
d) parasympathetic
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

55. You have a great deal of conscious control over the nerves of the _____ nervous system, but not over the nerves of the _____ nervous system.
a) somatic; autonomic.
b) autonomic; somatic.
c) peripheral; autonomic.
d) central nervous system; peripheral nervous system.
Answer: a
Skill Level: Evaluate
Difficulty: Moderate
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

56. The two divisions of the autonomic nervous system are the _____ and the _____
a) somatic; peripheral.
b) sympathetic; parasympathetic.
c) central; peripheral.
d) brain; spinal cord.
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

57. Jerry is having difficulty with the motor nerves in his leg. His problem is in the _____ nervous system.
a) autonomic
b) somatic
c) central

d) muscle
Answer: b *The somatic nervous system controls skeletal muscles.*
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

58. Justin is walking down the street when a loud bang comes from an industrial factory. He drops to the ground, sure it is a drive-by shooting in progress. Justin's _____ nervous system just kicked into high gear.
a) somatic
b) parasympathetic
c) sympathetic
d) peripheral
Answer: c
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

59. Malcolm is studying alone in his room when he hears a loud noise downstairs. His heart rate and respiration speed up. He wonders if a burglar has entered the house. When he looks downstairs, he sees that his cat just knocked over a plant. He begins to relax and his heart rate and breathing slow down. Which part of his nervous system is working to return him to a normal state?
a) Spinal cord
b) Somatic nervous system
c) Parasympathetic nervous system
d) Central nervous system
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

60. Mekala's sympathetic nervous system has been activated. Which of the following is true?
a) Her digestion sped up.
b) Her pupils dilated.
c) Her heart rate slowed down.
d) The blood flow to her internal organs increased.
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system

Topic: The Human Nervous System

61. Michael notices that every time he gets what he calls an “adrenalin rush,” his heart rate and pulse quicken and he feels a surge of energy. He also notices that lately it takes his body longer than normal to return to feeling calm and normal. What might explain Michael’s delay in coming down from his “adrenalin rush”?
a) His sympathetic nervous system might be too slow.
b) Michael’s parasympathetic nervous system may not be activating as quickly as usual.
c) Michael’s somatic nervous system might be interfering.
d) Michael’s parasympathetic nervous system may be overly active.
Answer: b
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

62. Tasha’s sympathetic nervous system is not working. Which of the following would be a likely result?
a) Tasha is experiencing an excess of flight or fight response.
b) Tasha’s digestion will be constantly slowed down.
c) Tasha’s heart will not speed up when she is in an emergency situation.
d) Tasha will develop health problems from chronic stress.
Answer: c
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

63. The central nervous system consists of the _____
a) parasympathetic and sympathetic divisions.
b) brain and spinal cord.
c) muscles and glands.
d) sense organs and sensory neurons.
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Item Analysis:
% correct 77 a = 17 b = 77 c = 0 d = 6 r = .24
% correct 82 a = 16 b = 82 c = 1 d = 2 r = .32
Topic: The Human Nervous System

64. The long bundle of neurons that carries messages to and from the body to the brain and is responsible for fast, life-saving reflexes is called the _____
a) spinal cord.

b) brain.
c) reflex arc.
d) interneuron.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Item Analysis: % correct 89 a = 89 b = 0 c = 2 d = 9 r = .31
Topic: The Human Nervous System

65. Corrado touched a hot radiator and instantly pulled his hand away. The neurons responsible for this protective reflex are the _____
a) brain, spinal cord, and interneurons.
b) sensory, interneurons, and motor neurons.
c) somatic, autonomic, and parasympathetic neurons.
d) automatic, reflexive, and sympathetic neurons.
Answer: b
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

66. 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.
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.
Answer: b
Skill Level: Analyze
Difficulty: Difficult
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Item Analysis: % correct 49 a = 17 b = 49 c = 14 d = 21 r = .51
Topic: The Human Nervous System

67. Heart rate, respiration, blood pressure and other functions vital to maintain life are controlled by the _____
a) hindbrain.
b) cerebellum.
c) midbrain.
d) limbic system.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

68. Tanae was drowsy, but when she heard her child call out, she felt immediately wide awake and alert. A part of her brain that plays a crucial role in her arousal level and attention is the _____
a) medulla.
b) pons.
c) cerebellum.
d) reticular formation.
Answer: d
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

69. Hunter was in a car accident and sustained damage to his cerebellum from a whiplash injury. Which problem would he be most likely to experience after the accident?
a) Trouble speaking
b) Being in a coma
c) Breathing and heart problems
d) Problems coordinating his movements
Answer: d
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

70. Without the _____ in your midbrain, you could not ride a bike without giving each movement conscious thought.
a) substantia nigra
b) thalamus
c) limbic system
d) pons
Answer: a
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

71. Which of the following brain structures is involved in regulating hunger, thirst, temperature, and sexual behavior?
a) Pons
b) Thalamus
c) Amygdala
d) Hypothalamus

Answer: d
Skill Level: Evaluate
Difficulty: Easy
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

72. The _____ is heavily involved in the learning of fear responses.
a) hypothalamus
b) amygdala
c) thalamus
d) pons
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

73. Tram's hippocampus was damaged by encephalitis. Which of the following would be true?
a) Tram would not be able to remember anything.
b) Tram would become angry and aggressive.
c) Tram would have difficulty forming new memories.
d) Tram would have difficulty with her vision.
Answer: c
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

74. The _____ is the part of the brain where cognitive and voluntary motor functions are controlled.
a) hindbrain
b) midbrain
c) limbic system
d) forebrain
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

75. The right and left halves of the cerebrum are called the _____
a) cerebral hemispheres.
b) corpus callosi.

c) cerebral halves.
d) cerebral lobes.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

76. The right and left halves of Shawna's cerebrum can no longer communicate with each other because her _____ was destroyed.
a) Thalamus
b) Cortex
c) Corpus callosum
d) Corpus cerebrum
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

77. The area of the brain primarily responsible for higher mental processes such as thinking and language is the cerebral _____
a) callosum.
b) cortex.
c) cerebellum.
d) white matter.
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

78. Gray matter gets its color from _____ whereas white matter gets its color from _____
a) cell bodies; dendrites.
b) myelinated axons; dendrites.
c) cell bodies; myelinated axons.
d) synaptic clefts; neurotransmitters.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

79. The cerebral cortex contains three types of areas. These are the _____, _____, and _____ areas.
a) sensory, motor, association
b) cerebrum, cerebellum, callosum

c) emotion, thinking, language
d) organ, skin, muscle
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

80. Memories, thought, perception and language are housed in the _____ area of the cerebrum.
a) sensory
b) limbic
c) association
d) dopaminergic
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

81. The cerebral cortex of humans is so large it should not fit in our skull. The only reason it does is because of its _____
a) shrinkage during gestation.
b) convolutions.
c) extension into the spinal cord.
d) absence of fluid.
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

82. Research suggests that the amount of _____ is associated with performance on intelligence tests.
a) white matter
b) brain volume
c) glia
d) gray matter
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

83. The first functional division of the cerebral cortex is _____
a) front, top, side and back.
b) into lobes.
c) left and right sides.

d) cerebrum and limbic areas.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

84. The second functional division of the cerebral cortex involves _____
a) frontal, parietal, temporal, and occipital lobes.
b) sensory, motor and association areas.
c) hindbrain, midbrain, forebrain.
d) hypothalamus, pons, limbic system.
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

85. Lateralization refers to which of the following?
a) The idea that the right side of the brain controls the left side of the body
b) The notion that each hemisphere of the brain specializes in particular functions
c) The procedure in which the corpus callosum is severed
d) The inability to produce speech
Answer: b
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

86. Which of the following statements is true regarding right and left hemisphere functioning?
a) Scientific research supports the claim that “right-brained” people are more creative.
b) Scientific research supports the claim that “left-brained” people are more logical.
c) Each hemisphere does have some specialized functions but they work together.
d) Scientific research suggests that there is no specialized function in either hemisphere.
Answer: c
Skill Level: Evaluate
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

87. Because the corpus callosum connects the left and right hemispheres of the brain, which of the following statements is most accurate?
a) Some people are left-brained and some people are right-brained.

b) Lateralization to the left hemisphere is more pronounced in women.
c) Right-brained activities consume more physical and mental energy than do left-brained activities.
d) People are neither “left-brained” nor “right-brained,” but rather “whole-brained;” we use both hemispheres all the time.
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

88. The right hemisphere controls movement on the _____ side of the body and handles most _____ functions.
a) left; motor
b) right; language
c) right; auditory
d) left; visual-spatial
Answer: d
Skill Level: Understand
Difficulty: Difficult
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

89. The left hemisphere controls movement on the _____ side of the body and handles most _____ functions.
a) left; motor
b) right; language
c) right; auditory
d) left; visual-spatial
Answer: b
Skill Level: Understand
Difficulty: Difficult
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

90. The left hemisphere has regions devoted to _____
a) processing emotional cues.
b) visual-spatial processing.
c) math and logic.
d) creative uses of thought and language.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres

Topic: A Closer Look at the Thinking Part of the Brain

91. People with severe, uncontrollable epilepsy, who have frequent grand mal seizures, have been helped by an operation that _____
a) severs the communication between hemispheres.
b) removes excitatory neurons.
c) severs the substantia nigra and basal ganglia.
d) removes most of the right hemisphere.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

92. If we briefly flashed the image of an orange to the right field of vision of an individual after split-brain surgery, the person will most likely say she or he saw _____
a) nothing.
b) an orange.
c) something but be unable to name it.
d) only something round.
Answer: b
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

93. Lyta sustained damage to her left hemisphere. Which of these areas is she most likely to have difficulty with as a result of left hemisphere damage?
a) Language
b) Control of the left side of her body
c) Interpreting facial expressions
d) Perceiving visual-spatial relationships
Answer: a
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

94. Which of the following represents an example of how damage to right hemisphere language areas might affect your language functions?
a) You might not understand the causal link between “I fell down” and “My knee hurts.”
b) You might not be able to speak.
c) You might not understand any language.
d) You might not be able to read out loud.

Answer: a
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

95. Much of what we know about left and right hemisphere specializations comes from the study of people who had split-brain surgery. This surgery _____
a) splits the lobes of the brain apart.
b) severs the corpus callosum between hemispheres.
c) severs the nerves from the spinal cord to the right hemisphere.
d) severs the substantia nigra between hemispheres.
Answer: b
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

96. Roger Sperry won a Nobel Prize in medicine in 1981 for work which revealed, among other things, that the _____
a) left hemisphere can't recognize objects.
b) right hemisphere can't recognize objects.
c) left hemisphere can recognize, but not name, objects.
d) right hemisphere can recognize, but not name, objects.
Answer: d
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

97. The largest of the brain's lobes, the _____ lobe, is where multiple cognitive functions are performed.
a) temporal
b) prefrontal
c) frontal
d) parietal
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

98. Known for “executive processing,” the _____ is part of the frontal lobe that coordinates many cognitive functions into a unified experience.
a) hippocampus
b) occipital cortex
c) prefrontal cortex
d) processing cortex
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

99. Phineas Gage is a famous example of someone who sustained damage to his prefrontal cortex and lost the ability to _____
a) think.
b) speak.
c) control impulses.
d) coordinate movement.
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

100. As the case of Phineas Gage illustrated, the prefrontal cortex contributes to _____ functioning in addition to cognitive functioning.
a) personality
b) motor
c) visual
d) auditory
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

101. Moving toward the back of the head, the last area of the frontal lobe contains the _____
a) visual cortex.
b) sensory cortex.
c) motor cortex.
d) parietal lobe.
Answer: c
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four

lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

102. Wilder Penfield, a neurosurgeon, developed a map of the _____ cortex by stimulating different areas in conscious patients undergoing neurosurgery.
a) visual
b) sensory
c) motor
d) parietal
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

103. Broca's area is involved in _____
a) understanding words.
b) choosing the correct words to use.
c) the muscle movements required for speech.
d) decision making.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

104. Aphasia is a general term for loss or impairment of the ability to _____
a) coordinate movement.
b) use or understand language.
c) recognize objects.
d) control impulses.
Answer: b
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

105. Directly behind the frontal lobe is the _____ lobe, where sensory information registers in the _____ cortex.
a) postfrontal; sensory
b) preoccipital; visual
c) temporal; auditory
d) parietal; somatosensory
Answer: d

Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

106. At the very back of the cerebrum, the _____ lobe contains the primary _____ cortex.
a) occipital; visual
b) parietal; sensory
c) auditory; temporal
d) limbic; emotional
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

107. Slightly above the ears, the _____ lobes contain the primary _____ cortex, which receives sound input from our ears.
a) auditory; temporal
b) temporal; auditory
c) hearing; sound
d) parietal; sensory
Answer: b
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

108. Speech sounds register first in the primary _____ cortex; they are then sent to _____ area where they are unscrambled into meaningful patterns of words.
a) temporal; Broca's
b) parietal; sensory
c) auditory; Wernicke's
d) sensory; prefrontal
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

109. Visual processing is to the _____ lobes as auditory processing is to the _____ lobes.
a) occipital; temporal
b) parietal; occipital

c) temporal; frontal
d) temporal; parietal
Answer: a
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

110. Marta was in an automobile accident and suffered an injury to her brain, resulting in paralysis of her left arm. What part of Marta's brain was injured?
a) Auditory association area
b) Motor cortex
c) Association areas
d) Somatosensory cortex
Answer: b
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Item Analysis: % correct 82 a = 0 b = 82 c = 5 d = 11 r = .36
Topic: A Closer Look at the Thinking Part of the Brain

111. Bill was admitted to the hospital last week after he fell. When Bill's son visited, he found his father was unable to form words without great difficulty. If Bill's difficulty speaking is due to brain damage, what is the likely location of the damage?
a) Broca's area
b) Gall's area
c) Wernicke's area
d) Korsakoff's area
Answer: a
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Item Analysis: % correct 75 a = 75 b = 2 c = 22 d = 2 r = .35
Topic: A Closer Look at the Thinking Part of the Brain

112. Ever since he suffered a brain injury by falling from a ladder, Zack's wife has continued to tell the doctor that Zack's personality has changed. He used to be fun loving and carefree, but he is now more critical and yells at the children for little reason. Zack is likely to have suffered damage to the _____ of his cortex.
a) occipital lobe
b) parietal lobe
c) prefrontal area
d) postfrontal area
Answer: c
Skill Level: Apply
Difficulty: Moderate

Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

113. 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
c) occipital lobe
d) parietal lobe
Answer: d
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Item Analysis:
% correct 65 a = 20 b = 11 c = 4 d = 65 r = .30
% correct 62 a = 18 b = 16 c = 5 d = 62 r = .32
Topic: A Closer Look at the Thinking Part of the Brain

114. Into our twenties, the brain develops in _____ of growth and _____
a) a steady pattern; learning.
b) an AB model; synaptogenesis.
c) pruning; lateralization.
d) spurts; pruning.
Answer: d
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

115. Differences in _____ may account for differences between children and adults in processing speed, memory, and other functions.
a) myelination
b) ion channels
c) cell membranes;
d) shrouding
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

116. Our brain has an amazing ability to adapt to changed inputs and to brain damage. We call this ability _____
a) plasticity.
b) lateralization.
c) pruning.

d) myelination.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

117. Pruning is _____
a) a process that eliminates unnecessary and redundant synapses.
b) a medical procedure used to remove brain tumors.
c) the death of brain cells due to disease or damage.
d) the shortening of dendrites to make them more efficient.
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

118. In adults over 70, the brain has _____
a) increased in weight.
b) decreased in weight.
c) lost all plasticity.
d) fewer neurotransmitter types.
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

119. Deterioration of the health of the heart and blood vessels poses an increased risk to the brain of damage from _____
a) death.
b) synaptogenesis.
c) too much pruning.
d) stroke.
Answer: d
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

120. Nora has had hearing defects since she was a child. She is now 43 and a new procedure to regenerate hair cells in the auditory canal has helped her to have those hearing defects corrected. What most likely occurred in Nora's brain as a result?
a) Not much; she was too old to have much brain plasticity.
b) Areas of her brain involved in sound perception changed noticeably.
c) Auditory signals were rerouted to the better functioning visual cortex.

d) Broca's area had trouble interpreting all the new sounds.
Answer: b
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

121. Maddy, age six, gets frustrated because she can't judge distance and direction as well as her ten-year-old sister, so she always loses at beanbag toss. Maddy's less accurate spatial perception is most likely due to which of the following?
a) Synaptogenesis
b) Slower processing speed
c) Lack of lateralization
d) Damage to her parietal lobe
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

122. Which of the following helps adults think faster than young children?
a) Myelination
b) An increase in dopamine
c) A decrease in GABA
d) Plasticity
Answer: a
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

123. Though very rare, three-year-old Zora suffered a stroke. After participating in two years of rehabilitation, Zora recovered nearly all of her lost functioning. What might account for this high degree of recovery?
a) A split-brain surgery
b) Plasticity and age
c) Pruning
d) Brain medication
Answer: b
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

124. Typically the brains of men have a _____ proportion of _____ than do the brains of women.
a) lower; white matter

b) higher; gray matter
c) higher; white matter
d) higher; glial cells
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.5.2: Compare how the brains of men and women differ
Topic: Age, Gender, and the Brain

125. Compared to a typical female brain, a typical male brain will have a _____ proportion of white matter in _____
a) higher; the left hemisphere.
b) similar; both hemispheres.
c) lower; the left hemisphere.
d) lower; the right hemisphere.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.5.2: Compare how the brains of men and women differ
Topic: Age, Gender, and the Brain

126. In women's brains, the proportions of white and gray matter are _____ in both hemispheres.
a) different
b) greater than men's
c) less than men's
d) the same
Answer: d
Skill Level: Evaluate
Difficulty: Moderate
Learning Objective: 2.5.2: Compare how the brains of men and women differ
Topic: Age, Gender, and the Brain

127. Compared to a typical male brain, a typical female brain has more gray matter in the area that processes _____
a) visual-spatial relationships.
b) emotional perception.
c) speed of thought.
d) self-image.
Answer: b
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.5.2: Compare how the brains of men and women differ
Topic: Age, Gender, and the Brain

128. Before we know what differences between typical male and typical female brains mean, we need research that looks for links between these brain differences and _____

a) gender.
b) intelligence.
c) behavior.
d) speed of processing.
Answer: c
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.5.2: Compare how the brains of men and women differ
Topic: Age, Gender, and the Brain

129. The endocrine system consists of various _____ that create and release _____
a) glands; hormones.
b) neurons; neurotransmitters.
c) glial cells; hormones.
d) glands; acetylcholine.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

130. The pituitary gland produces _____
a) melatonin.
b) PTH.
c) growth hormone.
d) sex hormones.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

131. The _____, often referred to as the master gland because it activates other glands, is located _____
a) pituitary gland; just above the kidneys.
b) pineal gland; in the lower neck.
c) pituitary gland; near the hypothalamus.
d) pineal gland; just above the kidneys.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

132. Melatonin, a hormone that regulates sleep and wakefulness, is produced by the _____ gland.
a) pineal

b) pituitary
c) parathyroid
d) thymus
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

133. Our metabolism, the rate at which food is converted to energy, is controlled by a hormone released by the _____
a) parathyroid.
b) adrenal glands.
c) pancreas.
d) thyroid.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

134. In order to have the right balance of calcium and magnesium in our bloodstream, we need a functional _____ gland.
a) thyroid
b) parathyroid
c) adrenal
d) thymus
Answer: b
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

135. Despite having a massive infection, Lindsey's white blood cell count remained low. This could be due to a malfunction of her _____
a) thymus.
b) parathyroid.
c) thyroid.
d) thalamus.
Answer: a
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

136. Andrew has Type I diabetes. He wishes his _____ would produce the right amount of _____ so he would not have to have daily injections.

a) adrenal glands; epinephrine
b) pancreas; corticoids
c) pancreas; insulin
d) pituitary; glycogen
Answer: c
Skill Level: Apply
Difficulty: Easy
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

137. _____, produced by the _____ gland(s), plays a role in activating the _____ nervous system.
a) Testosterone; gonads; central
b) Epinephrine; adrenal; sympathetic
c) Epinephrine; adrenal; parasympathetic
d) Progesterone; pituitary; sympathetic
Answer: b
Skill Level: Understand
Difficulty: Difficult
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

138. Activated by the _____, gonads release _____
a) thymus; estrogen.
b) pineal gland; testosterone.
c) pituitary; corticoids.
d) pituitary; sex hormones.
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

139. Arnie was just nearly hit by a car. His adrenal gland just dumped _____ into his bloodstream.
a) glucogon
b) thymosin
c) corticoids
d) emergogen
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

140. Samuel still felt enraged hours after he was cut off on the highway, and he wanted to hit somebody. This may be because his _____ glands are still signaling his brain, maintaining this response to the earlier threat.
a) thymus
b) sex
c) pineal
d) adrenal
Answer: d
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

141. _____ are segments of DNA located on _____
a) Genes; chromosomes.
b) Chromosomes; genes.
c) Autosomes; genes.
d) Genotypes; chromosomes.
Answer: a
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

142. Except for sperm and egg cells, the nuclei of normal body cells contain _____ chromosomes.
a) 23
b) 46
c) 21
d) 69
Answer: b
Skill Level: Understand
Difficulty: Easy
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

143. The Human Genome Project's goal is to identify the _____ of all genes and their locations on the _____
a) mutations; nuclei.
b) makeup; genotype.
c) source; chromosomes.
d) function; chromosomes.
Answer: d
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

144. Matched pairs of chromosomes, both carrying genetic information for particular traits, are called _____
a) dominant-recessive.
b) sex chromosomes.
c) autosomes.
d) polygenic.
Answer: c
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

145. Arlo carries a gene for tallness, but he is fully-grown and only 5 feet tall. Tallness is his _____, shortness is his _____
a) phenotype; genotype.
b) polygenic inheritance; genotype.
c) genotype; phenotype.
d) sex-linked gene; expressed gene.
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

146. Einar has a gene for a bone disease, but he does not have the disease. Which of the following could be a reason this may have happened?
a) The gene is sex-linked.
b) The gene is dominant.
c) The gene is recessive.
d) The gene is fragile.
Answer: c
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

147. Some traits are influenced by many genes. This is called _____
a) multifactorial inheritance.
b) dominant-recessive pairing.
c) phenotypal clustering.
d) polygenic inheritance.
Answer: d
Skill Level: Evaluate
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

148. Sex-linked inheritance means which of the following?
a) The gene is on an X or a Y chromosome.
b) The gene is dormant until after puberty.
c) The gene is only inherited by females.
d) The gene is only active in males.
Answer: a
Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

149. Patti is passing on a mutated gene on her X chromosome. Why is her son more likely to express the mutation in his phenotype than her daughter is?
a) Males are more likely to inherit the bad copy of a gene whenever there is one.
b) Males do not have a second X chromosome that might have a good copy of the gene.
c) Estrogen will silence a mutated gene once her daughter experiences puberty.
d) Her daughter's Y chromosome will probably have a good copy of that gene to offset the bad one.
Answer: b
Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

150. Twin studies and studies of adopted children allow behavioral geneticists to research the _____
a) polygenic nature of inheritance.
b) relative contributions of genes and environment.
c) ways genes always win over environment.
d) ways environment always wins over genes.
Answer: b
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

Completion (Fill-in-the-Blank)

1. The branch-like structures that take in information are the _____, whereas the long, tail-like structures that transmit information down the length of the neuron are _____.
Answer: dendrites; axons
Difficulty: Easy
Skill Level: Analyze
Learning Objective: 2.2.1: Describe the function of each part of the neuron
Topic: The Neurons and the Neurotransmitters

2. It is not the strength of the neural message that determines how strongly we experience something, but rather the _____ and the _____.
Answer: speed/rate; number/how many impulses or action potentials
Difficulty: Difficult
Skill Level: Analyze
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

3. Neurotransmitters have the ability to bind with receptors located on _____ and _____.
Answer: dendrites; cell bodies or somas
Difficulty: Difficult
Skill Level: Analyze
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

4. _____ is the neurotransmitter known for affecting movement and causing muscle contractions in humans.
Answer: Acetylcholine
Difficulty: Easy
Skill Level: Understand
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

5. The neurotransmitter _____ is suspected to play a role in attention-deficit disorder.
Answer: dopamine
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

6. Imagine you are playing in a championship basketball game. You have just taken a fall while trying to get a rebound and your ankle begins to hurt. Moments later, you notice the pain in your

ankle seems to have subsided. You attribute this pain relief to a release of _____, which is a type of neurotransmitter that relieves pain.
Answer: endorphins
Difficulty: Easy
Skill Level: Apply
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

7. The peripheral nervous system includes all of the nerves not in _____.
Answer: bone or the skull or backbone/spine
Difficulty: Easy
Skill Level: Understand
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

8. The _____ nervous system mobilizes the body's resources in an emergency.
Answer: sympathetic
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

9. All sensory information from the peripheral nervous system reaches the brain through the _____.
Answer: spinal cord
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

10. The _____ handles unconscious functions so critical to life that damage to it is life threatening.
Answer: hindbrain; brain stem; medulla
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

11. After a brain injury, Joelle had difficulty maintaining her posture and coordinating smooth movements. She most likely sustained injury to her _____.
Answer: cerebellum

Difficulty: Moderate
Skill Level: Apply
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

12. The _____ regulates hunger, thirst, sexual behavior, emotional behaviors and sleep/wake c1ycles
Answer: hypothalamus
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

13. Two deficits typically observed in individuals with damage to the hippocampus are _____ and _____.
Answer: difficulty forming new memories; navigation or spatial skills or learning our way around
Difficulty: Difficult
Skill Level: Apply
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

14. The cerebrum is devised primarily of the following brain components: _____, _____, and _____.
Answer: cerebral cortex; corpus callosum; cerebral hemispheres (*or* right hemisphere; left hemisphere; corpus callosum)
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

15. The outermost layer of the brain, called the _____, is mostly responsible for higher mental functions such as language, memory, and thinking.
Answer: cerebral cortex
Difficulty: Easy
Skill Level: Understand
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

16. The human cerebral cortex appears to have many folds or wrinkles called _____; the purpose of these wrinkles is _____.
Answer: convolutions; to allow the large cerebral cortex to fit within the skull
Difficulty: Moderate
Skill Level: Analyze

Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

17. The _____ allows for voluntary body movement and is located within the _____ lobe.
Answer: motor cortex; frontal
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.4.1: List the components of the cerebrum
Topic: A Closer Look at the Thinking Part of the Brain

18. Danielle knows exactly what she wants to say, but is having great difficulty saying it. The few times she has spoken since her car accident, friends and family have reported that her speech is very slow, labored, and poorly articulated due to her brain injury. Danielle likely suffers from _____.
Answer: Broca's aphasia or damage to Broca's area
Difficulty: Difficult
Skill Level: Apply
Learning Objective: 2.4.2: Compare the specialized functions of the left and right cerebral hemispheres
Topic: A Closer Look at the Thinking Part of the Brain

19. Jordan can reach into his backpack and find his set of keys without looking. His ability to identify this stimulus solely by touch is afforded to him by his _____ lobe.
Answer: parietal
Difficulty: Difficult
Skill Level: Apply
Learning Objective: 2.4.3: Describe the functions that are associated with each of the four lobes of the cerebral cortex
Topic: A Closer Look at the Thinking Part of the Brain

20. The brain's ability to adapt and/or reorganize as a result of an injury is called _____.
Answer: plasticity
Difficulty: Easy
Skill Level: Analyze
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

21. A _____ results when an artery is blocked and the blood supply to a particular area of the brain is cut off.
Answer: stroke
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

22. While driving, you notice that the car in front of you has come to a screeching halt. You, in turn, slam on the breaks. During this time, your sympathetic nervous system is activated due to your _____ glands' production of the neurotransmitters _____ and _____.
Answer: adrenal; epinephrine; norepinephrine
Difficulty: Difficult
Skill Level: Apply
Learning Objective: 2.6.1: Describe the functions of the glands of the endocrine system
Topic: Beyond the Nervous System

23. Except for the _____ and _____, the nuclei of normal human body cells contain _____ pair(s) of chromosomes.
Answer: egg cell; sperm cell; 23
Difficulty: Moderate
Skill Level: Understand
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

24. When a trait is influenced by both genes AND the environment, it is said to have a _____ pattern of inheritance.
Answer: multifactorial
Difficulty: Moderate
Skill Level: Analyze
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

25. Behavioral geneticists study twins and adopted people in order to help us understand the interaction of _____.
Answer: genes and environment or nature and nurture
Difficulty: Difficult
Skill Level: Analyze
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

Essay Questions

1. Explain at least three of the following techniques used to study the brain: EEG, CT scan, MRI, PET scan, fMRI. What is the significance of these brain-imaging techniques?

Answer:

- **EEG.** Electrodes placed on the scalp allow for the measurement of brain waves. Beta waves suggest mental and/or physical activity. Alpha waves suggest relaxation. Delta waves suggest sleep. Computerizing these waves allows for the study of various disorders such as Alzheimer's disease, epilepsy, and so on.
- **CT scan:** Rotating X-rays produce cross-sectional images of the various brain structures. This allows for the detecting of tumors, brain injuries, and so on.
- **MRI:** This scanning technique offers detailed images of the brain. It allows for the discovery of various brain abnormalities without exposing people to harmful X-rays.
- **PET scan:** This imaging technique shows brain activity in various locations. It can offer information such as how much oxygen is being used, how much glucose is being consumed, and how various substances affect the brain. This tool affords scientists the ability/potential to unlock some of the brain's mysteries.
- **fMRI:** This imaging technique allows for the study of both the structure AND activity of the brain. It offers more precise information as compared to the PET scan.

Brain-scanning techniques have helped us learn much about brain anatomy, structures, and activity. They have allowed scientists to not only study the abnormal, but also what is normal or expected. Once scientists know what should be happening in the brain, they will be better able to detect when things are going awry. Overall, these techniques have played a large role, and will continue to do so, in the development of treatments.

Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

2. Explain in detail how information is sent from one neuron to the next.

Answer: The information, once received from the dendrite or cell body, travels down the length of the neuron via the axon. The axon then splits into the axon terminals, which house the synaptic vesicles. The vesicles merge with the membrane and then release neurotransmitters into the synapse, or the junction between the two neurons. Some of the neurotransmitters will fit into the receptor sites on the dendrites or cell bodies of a nearby neuron. If they do, that particular neurotransmitter binds with that receptor site. After binding occurs, the information carried by the neurotransmitter is sent to the next neuron. When neurotransmitters do not find receptor sites, they are often broken down, reabsorbed, and recycled for the next time around. They may also have not had a chance to bind if reuptake occurred.

Skill Level: Understand
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous

system
Topic: The Neurons and the Neurotransmitters

3. Aiden was hit by a drunk driver and sustained a severe injury to his left frontal lobe. What should Aiden and his family expect now? What difference, if any, might Aiden's age make on the situation?

Answer: If Aiden is an adult, his impairments may be numerous. Because research suggests that the frontal lobe houses the motor cortex, we can speculate that voluntary muscle movement on his right side will be affected. He may lose the ability to move, or he may have much impairment in moving the right side of his body. Second, research tells us that Broca's area is in the left frontal lobe, so Aiden will either have difficulty producing speech or not be able to produce speech at all. (This is called Broca's aphasia.) Finally, the frontal lobe houses the frontal association areas. Many abilities come from this region of the brain, such as impulse control, thinking, planning, motivation, and emotional responses. Thus, it is likely that Aiden will have impairments in those areas. For example, Aiden could become more impulsive and not think of the consequences of his behaviors. He may not think ahead due to his problems with planning. His thinking abilities may be greatly impaired. He may demonstrate a lack of motivation. Maybe most important is that Aiden will likely not be the same person he was before the accident. His family may see drastic changes in emotional behavior or personality.

If Aiden happens to be a very young child, the picture may not be as grim. Very young children have a higher degree of brain plasticity in which parts of their brain can take over for injured sites. In that case, Aiden will likely have some impairment, but not to the degree an adult would.

Skill Level: Apply
Difficulty: Difficult
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

4. Discuss the difference between phenotype and genotype and why the phenotype may be different from the genotype in an individual.

Answer: The genotype is the actual genetic makeup, the genes on an individual's chromosomes. The phenotype comprises the actual traits the person has. Genotype remains stable, but environmental factors can influence whether a gene is active or expressed.

There may be a dominant-recessive pattern. In a dominant-recessive pairing, the dominant gene will stop the recessive gene from being expressed in the phenotype. Multifactorial inheritance (or the influence of the environment) may mean genetic potential is not reached. Someone with genes for tallness, for example, may experience malnutrition so they don't achieve their potential height.

Skill Level: Analyze
Difficulty: Difficult
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

5. Describe the two different types of twins and explain their significance to the field of psychology.

Answer: Identical twins occur when one egg is fertilized by one sperm. After fertilization, the egg splits into two, thereby creating two eggs with the same genetic material. Fraternal twins happen when two eggs are released at the same time and the eggs are fertilized by different sperm.

Fraternal twins are no more genetically similar than any sibling pairs from the same biological mother and father.

Behavioral geneticists are those in the field of psychology who dedicate their careers to studying the effects of heredity and environment on behavior. Twin studies help behavioral geneticists unravel environmental versus genetic influences on traits and characteristics. This is especially true in the case of monozygotic twins reared together and apart. Because they share 100 percent of the same DNA, researchers can begin to figure out which traits are inherited or learned from the environment.

Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.6.2: Explain the effect of heredity on physical and psychological traits
Topic: Beyond the Nervous System

Critical Thinking Questions

1. Discuss on what basis you would decide between doing an MRI or an fMRI imaging study on a patient.
Answer: An MRI would be useful only for determining changes in structure. The fMRI would be necessary to show both structures and activity.
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.1.2: Summarize how researchers use imaging techniques to study the nervous system
Topic: Discovering the Mysteries of the Nervous System

2. Can neurons fire at a constant rate all of the time? Why or why not?
Answer: No. Immediately after a neuron fires, it enters the refractory period. This is a short break or a resting time that lasts about one to two milliseconds.
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

3. In terms of neural firing, how can we tell the difference between a strong stimulus (such as a stray dog running toward you) and a weak stimulus (such as seeing a butterfly)?
Answer: The strong stimulus will cause more neurons to fire at the same time, whereas the weak stimulus will cause only a few neurons to fire at the same time. In addition, a strong stimulus will cause those neurons to fire at a very fast rate (several hundred times per second), whereas the weak stimulus will cause the neurons to fire at a much slower rate.
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

4. How do neurons receive information after the neurotransmitters are in the synapse?
Answer: Though dendrites are the primary receivers of signals carried by neurotransmitters, the membranes of cell bodies also have this ability. Both dendrites and cell bodies have receptor sites that allow the neurotransmitter to fit in (or bind) to the appropriate receptor sites. This binding allows the neuron to receive, or take in, the message/information that is being transmitted.
Skill Level: Analyze
Difficulty: Easy
Learning Objective: 2.2.2: Explain how neurons transmit messages through the nervous system
Topic: The Neurons and the Neurotransmitters

5. Explain how neurotransmitter levels are maintained.

Answer: The cell body continues to manufacture them; they may be broken down into component parts and recycled to be used again; the process of reuptake places them back in the axon terminal, ready for immediate use again.
Skill Level: Understand
Difficulty: Difficult
Learning Objective: 2.2.3: Describe how neurotransmitters send and receive messages in the brain
Topic: The Neurons and the Neurotransmitters

6. What might result if an individual's sympathetic nervous system is overactive?
Answer: An overactive sympathetic nervous system would likely result in an extended stay in the "fight-or-flight" mode. It may also result in repeated fight-or-flight responses. The body would experience increased heart rate, increased pulse rate, increased respiratory rate, decreased digestion, and so on. This could lead to chronic anxiety or perhaps even cardiac problems.
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.3.1: Describe the functions of the structures within the peripheral nervous system
Topic: The Human Nervous System

7. What will likely result from an injury to the limbic system?
Answer: The limbic system includes both the amygdala and the hippocampus. As a whole, the limbic system is involved in expression of emotions, memory, and motivation. Thus, injury to this site will likely involve impairments in emotional expression, memory, and motivation.
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system
Topic: The Human Nervous System

8. Discuss the changes that might take place with damage to the prefrontal lobes.
Answer: Multiple functions may be impaired or lost, including cognition and executive processing.
Judgment may be impaired. It may become difficult to inhibit one's impulses, manage emotions, or anticipate the consequences of what you do. Instead of cognitive tasks seeming like a unified whole, they may seem fragmentary and disconnected. There may be personality changes and behavior changes. This question may also be answered with examples of such changes.
Skill Level: Apply
Difficulty: Moderate
Learning Objective: 2.3.2: Describe the functions of the structures within the central nervous system

9. In terms of brain development, what might account for the differences in processing speed and level of thinking between children and adults?
Answer: The brain continues to develop through young adulthood. The frontal lobes do not become fully myelinated until about age 12. The frontal lobes also undergo growth spurts (due to synaptogenesis) well into adulthood. With more brain matter, more synapses, and full

myelination, level of thinking and processing speed (in addition to many other skills) substantially increase from childhood to adulthood.
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain

10. What is the significance of brain plasticity?
Answer: Plasticity is the brain's ability to reorganize in light of any change in the brain. This plasticity allows for a range of events to occur, from learning a new skill all the way to relearning how to speak after a stroke. Plasticity allows the brain to adapt to changes in input or damage.
Skill Level: Analyze
Difficulty: Moderate
Learning Objective: 2.5.1: Summarize how the brain changes across the life span
Topic: Age, Gender, and the Brain