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1. The three types of neurons are:
   A) excitatory, inhibitory, and myelinated.
   B) sensory, motor, and interneurons.
   C) interneurons, glial cells, and motor cells.
   D) glial cells, myelinated cells, and unmyelinated cells.

2. In general, neural messages are received by the _____ and transmitted by the _____.
   A) cell body; dendrites
   B) axons; nucleus
   C) dendrites; axon
   D) axon; dendrites

3. What happens during a refractory period?
   A) The neuron becomes polarized for the first time.
   B) The neuron reestablishes the negative-inside/positive-outside condition.
   C) Neurotransmitters are blocked by dendrites.
   D) Dopamine reaches its peak levels.

4. When neurotransmitters communicate an inhibitory message to the postsynaptic neuron:
   A) reuptake is inhibited.
   B) the presynaptic neuron is less likely to activate.
   C) the action potential is canceled out.
   D) the postsynaptic neuron is less likely to activate.

5. Michael takes medication that increases _____ levels to help control symptoms of Parkinson's disease.
   A) endorphin
   B) serotonin
   C) GABA
   D) dopamine

6. According to your textbook, _____ is associated with increased endorphin levels.
   A) nicotine addiction
   B) heavy consumption of alcohol
   C) muscle rigidity during aerobic exercises
   D) the pain-relieving effect of acupuncture

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7. The venom of a black widow spider bite causes _____ to be released continuously by motor neurons causing severe muscle spasms.
   A) acetylcholine
   B) dopamine
   C) GABA
   D) serotonin

8. _____ represent bundles of axons that are _____ to see with the unaided eye.
   A) Nerves; mostly large enough
   B) Interneurons; too small
   C) Neurons; mostly large enough
   D) Chemical messengers; too small

9. Janeen and Marty were strolling down a wooded path in a city park when a man holding a knife suddenly jumped out of the shrubbery. Rather than fight, Janeen and Marty decided to flee and took off, running in the opposite direction. This quick reaction reflects the fight-or-flight response, which is triggered by the _____ nervous system, which stimulates the_____ to produce _____.
   A) somatic; adrenal medulla; dopamine and serotonin
   B) parasympathetic; adrenal cortex; melatonin and androgen
   C) sympathetic; adrenal medulla; epinephrine and norepinephrine
   D) central; hypothalamus; GABA and dopamine

10. The _____ is the main link between the nervous system and the endocrine system.
   A) cerebellum
   B) hypothalamus
   C) pineal gland
   D) amygdala

11. The _____ is involved in regulating blood sugar levels and in hunger.
   A) pituitary gland
   B) pancreas
   C) pineal gland
   D) thyroid gland

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12. Although _____ has been shown to be a pseudoscience, it helped introduce the idea that functions were _____ in the brain.
    A) phrenology; lateralized
    B) neuroscience; plastic or flexible
    C) neuroscience; lateralized
    D) phrenology; localized

13. The development of new neurons in the brain is called:
    A) neurogenesis.
    B) structural plasticity.
    C) neuroplasticity.
    D) functional plasticity.

14. According to research presented in your text, stress, exercise, and environmental complexity can affect the rate of _____ in the brains of monkeys, rodents, and birds.
    A) neuroplasticity
    B) cortical localization
    C) myelination
    D) neurogenesis

15. The brainstem is made up of several structures, which include the:
    A) thalamus, hypothalamus, hippocampus, and amygdala.
    B) medulla, pons, cerebellum, reticular formation, and midbrain, including the substantia nigra.
    C) temporal lobe, parietal lobe, the occipital lobe, and frontal lobe.
    D) corpus callosum, cerebral cortex, and the structures that make up the limbic system.

16. The _____ is the largest region of the brain.
    A) midbrain
    B) hindbrain
    C) forebrain
    D) pons

17. Samuel suffered damage to his temporal lobe during an operation to remove tumors from his brain. He is likely to have problems with his:
    A) vision.
    B) ability to smell and taste.
    C) hearing.
    D) ability to process somatosensory information.

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18. Processing somatosensory information is to the _____ lobe as seeing is to the _____ lobe.
    A) parietal; temporal
    B) frontal; parietal
    C) temporal; occipital
    D) parietal; occipital

19. The _____ is the part of the limbic system that is involved in emotional responses and memories with a strong emotional component.
    A) amygdala
    B) thalamus
    C) hypothalamus
    D) medulla

20. According to the box Critical Thinking: "His" and "Her" Brains, research indicates that:
    A) brain structures and functions in men and women are essentially the same.
    B) men and women are much more different than they are similar.
    C) women are less effective at problem solving and decision making.
    D) men are much more emotional than previously believed.

21. Broca is to _____ as Wernicke is to _____.
    A) expressive aphasia; receptive aphasia
    B) the left cerebral hemisphere; the right cerebral hemisphere
    C) structural plasticity; functional plasticity
    D) receptive aphasia; expressive aphasia

22. Most left-handed people are:
    A) right-hemisphere dominant for language, the opposite pattern as right-handed people.
    B) left-hemisphere dominant for language, like most right-handed people.
    C) bilateral, using both hemispheres equally for virtually all tasks, including speech and language tasks.
    D) right-hemisphere dominant for language in their childhood but become increasingly left-hemisphere dominant by early adulthood.

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Answer Key

1. B
2. C
3. B
4. D
5. D
6. D
7. A
8. A
9. C
10. B
11. B
12. D
13. A
14. D
15. B
16. C
17. C
18. D
19. A
20. B
21. A
22. B

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1. What is biological psychology and why is this area of study important?

2. How do sensory neurons, motor neurons, and interneurons differ?

3. What are the three basic components of a neuron, and what function does each component perform?

4. Describe the functions of glial cells, as well as the microglia, astrocytes, oligodendrocytes, and Schwann cells.

5. What does it mean to say that a neuron is polarized?

6. What is the refractory period, and what takes place during that period?

7. Describe the sequence of events that occurs when one neuron communicates with another neuron.

8. Select two neurotransmitters and describe their influence on behavior.

9. What are endorphins and what are their functions?

10. Li is an avid runner. Despite her busy lifestyle, Li runs at least 50 miles a week, even in the winter months. When asked why running is such a high priority, Li explains that she loves experiencing a "runner's high." Explain what this concept means.

11. Explain with examples how a drug can act as an antagonist.

12. Define and give an example of an agonist drug.

13. Compare and contrast the effects of agonist and antagonist drugs.

14. Define and give an example of an antagonist drug.

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15. Julian is 50 years old. He played football for over 20 years, starting in middle school. After college, he played semi-pro football until he injured his knee, which required multiple surgeries to repair. Over the course of his football career, Julian sustained repeated concussions. Julian's family has noticed that he has become increasingly anxious and depressed over the past few years. Although he was never impulsive before, Julian now gambles and goes on spending sprees—sometimes buying items that he will never use. He has difficulty remembering important dates, complains that he can't concentrate, and he becomes angry when distracted as he struggles to sustain his attention for more than a few minutes. According to the In Focus Box: Traumatic Brain Injury: From Concussions to Chronic Traumatic Encephalopathy, what condition does Julian likely have? Will his doctor be able to diagnose the condition at his next physical? Why or why not?

16. What are spinal reflexes? Are they important?

17. Briefly describe the functions of the different subdivisions of the peripheral nervous system.

18. What are the functions of the sympathetic nervous system and the parasympathetic nervous system?

19. How does information transmission in the endocrine system differ from that in the nervous system?

20. Explain how the hypothalamus, endocrine system, and nervous system are linked. How does the hypothalamus contribute to the functioning of the endocrine glands?

21. Describe phrenology and explain the contribution it has made to the understanding of the brain.

22. Describe the goals of the Human Connectome Project, the diffusion spectrum imaging technique, and the challenges faced by the Project.

23. Explain the difference between structural plasticity and functional plasticity. Give an example of each.

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24. Assume that you are going to learn a challenging new skill, such as juggling or a complicated video game. According to research presented in your textbook, how long does it take for learning to transfer into structural changes in the brain?

25. What are the key structures of the hindbrain and what roles do they play?

26. What are the key structures of the midbrain and what roles do they play?

27. Identify the four lobes of each cerebral hemisphere and summarize the function associated with each lobe.

28. What is the somatosensory cortex? How is it organized?

29. What is the primary motor cortex? What is the degree of representation on the primary motor cortex?

30. What are the key structures of the limbic system?

31. What is the hypothalamus? What roles does it play?

32. Describe the differences in male and female brains and discuss what conclusions can be drawn from research on gender differences and the brain.

33. What contributions did Pierre Paul Broca and Karl Wernicke make to the understanding of the brain?

34. What is meant by the phrase lateralization of function?

35. Distinguish between cortical localization and lateralization of function and give an example of each.

36. Who was Roger Sperry and what contributions did he make to the understanding of the human brain?

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37. Byron is left handed. His parents have told Byron that his handedness means he is right-hemisphere-dominant. Are Byron's parents correct?

38. Compare the effects on rats of being raised in an enriched versus an impoverished environment.

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Answer Key

1. The answer should include the following information: Biological psychology is the scientific study of the biological bases of behavior and mental processes. It is one of the scientific disciplines that make important contributions to neuroscience—the scientific study of the nervous system.
2. The answer should include the following information: 1) Sensory neurons receive information from the environment via specialized receptors cells that detect light, sound, touch, taste, and smell. These cells provide an input to the central nervous system and convey information to neurons and then ultimately the brain. 2) Motor neurons represent the output of the central nervous system conveying information to muscles and glands. 3) Interneurons are the most numerous cells in the central nervous system allowing the communication of information among neurons in the brain.
3. The answer should include the following information: The three basic components of a neuron include the cell body, the dendrites, and the axon. The cell body, also called the soma, contains structures manufacture proteins and process nutrients, providing the energy the neuron needs to function. The soma also contains the nucleus of the cell, which in turn contains the neuron's genetic material—twisted strands of DNA called chromosomes. The dendrites receive messages from other neurons or specialized cells. Dendrites branch extensively producing a tree-like appearance. Some neurons have thousands of dendrites. Finally, the axon is a single elongated tube that extends from the cell body of most neurons. The axon may branch at the tip to form multiple terminals with other cells. Thus, axons convey information from the neuron to other cells such as neurons, glands, or muscles.
4. The answer should include the following information: Glial cells are the most abundant cell type in the brain, outnumbering neurons by about 10 to 1. Glial cells provide structural support for neurons throughout the nervous system. There are several different kinds of glial cells. First, microglia are the cells that remove waste products as well as dead or damaged neurons from the nervous system. Second, astrocytes provide connections between neurons and blood vessels and are also involved in brain development and the communication of information among neurons. Two other types of glial cells, oligodendrocytes in the brain and Schwann cells in the rest of the nervous system, form the myelin sheath**,** a white fatty covering that is wrapped around the axons of some, but not all, neurons.
5. The answer should include the following information: 1) A difference in the electrical charge between the inside and the outside of the axon represents the resting membrane potential of a neuron. This membrane potential is created by a greater concentration of negative ions inside the neuron compared to the exterior fluid surrounding the axon. The negative electrical charge is about -70 millivolts. 2) In this polarized, negative-inside/positive-outside condition, there are different concentrations of two particular ions: sodium and potassium. While the neuron is in resting potential, the fluid surrounding the axon contains a larger concentration of sodium ions than does the fluid within the axon. The fluid within the axon contains a larger concentration of potassium ions than is found in the fluid outside the axon.
6. The answer should include the following information: After conducting an action potential, the neuron enters a refractory period, a period of time in which the neuron is

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unresponsive to stimulation. While this period may only be for a thousandth of a second or less, the neuron cannot fire because it is in the process of repolarizing. This process involves reestablishing the negative-inside/positive-outside condition so that the neuron is able to fire again. Repolarization is a progressive process that occurs at each segment down the axon much like depolarization.

7. The answer should include the following information: Activation of a presynaptic neuron will generate an action potential that travels to the end of the axon. The action potential will travel to the axon terminals and stimulate the release of neurotransmitters from synaptic vesicles. The action potential causes the synaptic vesicles to "dock" on the axon terminal membrane and release the neurotransmitters into the synaptic gap or space between the neurons. Thus, communication between/among neurons involves electrochemical conduction such that the electrical signal (action potential) is converted into a chemical signal. The neurotransmitters cross the synaptic gap and attach to receptor sites on the dendrites of the receiving or post-synaptic neuron. This synaptic transmission process only takes a few millionths of a second, stimulating an electrical potential in the postsynaptic cell. After making contact with the postsynaptic receptors, the neurotransmitter molecules detach from the receptor and are reabsorbed by the presynaptic neuron so they can be recycled and used again. This process is called reuptake and occurs for neurotransmitters that bond to a receptor as well as those that failed to do so. Neurotransmitter molecules that are not reabsorbed or that remain attached to the receptor site are broken down or destroyed by enzymes.
8. The answer should include the following information (Students only need to pick two of the neurotransmitters described below.): Acetylcholine is involved in learning, memory and muscle contractions. Deficits in this neurotransmitter have been linked to Alzheimer's disease. Dopamine is associated with movement, thought processes, and rewarding sensations. Deficiencies in this neurotransmitter have been linked to Parkinson's disease, schizophrenia, and drug addiction. Serotonin is known to be involved in emotional states, sleep and sensory perception. Alterations in serotonin have been reported in depression. Norepinephrine is linked to physical arousal, learning, memory, and regulation of sleep. Alterations in this neurotransmitter are associated with depression and stress. Glutamate is an excitatory neurotransmitter. Levels are altered in patients that experience seizures as well as in Alzheimer's disease. GABA is an inhibitory neurotransmitter. Levels are altered in anxiety disorders.
Endorphins are involved in pain perception, positive emotions, and opioid addiction.
9. The answer should include the following information: Endorphins are an important class of neurotransmitter that are chemically similar to morphine, heroin, and other opioid drugs (although they are more potent). Endorphins are released in stressful circumstances, following trauma, and during painful stimulation. They have been implicated in the pain-reducing effects of acupuncture and are also associated with positive mood.
10. The answer should include the following information: "Runner's high" is the rush of euphoria that many people experience after intense aerobic exercise, especially running or cycling. In a study, after two hours of endurance running, PET scans showed high levels of natural endorphin production in brain regions involved in positive emotions. The scans also show that endorphin activity is positively correlated with subjective experience: The more intense the euphoria experienced by the individual runner, the

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higher the level of endorphin activity in the brain.

11. The answer should include the following information: A drug can act as an antagonist by blocking the effect of neurotransmitters. A drug may fit into receptor sites and prevent neurotransmitters from binding. Curare blocks acetylcholine receptor sites causing paralysis. It does this by blocking acetylcholine from binding to receptors on the muscle. Naloxone works similarly on endorphin receptors. Naloxone blocks the effects of heroin, oxycodone, or other opioid drugs.
12. The answer should include the following information: An agonist is a drug or other chemical that is chemically similar to a specific neurotransmitter and binds to the receptor to produce the same effect. Nicotine is an example of an acetylcholine agonist that binds to the cholinergic receptor acting as a stimulant for skeletal muscles and causing the heart to beat more rapidly.
13. The answer should include the following information: Drugs may increase or decrease the amounts of neurotransmitters released by neurons. The venom of a black widow spider bite is an example of an agonistic effect since it causes acetylcholine to be released continuously by motor neurons thus causing severe muscle spasms. Another type of agonistic effect may be to alter the length of time a neurotransmitter remains in the synaptic gap, either increasing or decreasing the amount available to the postsynaptic receptor. Blocking the reuptake of the neurotransmitters by a sending neuron will prolong the effects of a neurotransmitter resulting in an agonistic effect. Selective serotonin reuptake inhibitors (SSRI's) are an example of this effect. Cocaine acts similarly to block the reuptake of dopamine, an agonistic effect. Antagonists such as curare block the acetylcholine receptor sites causing paralysis by blocking acetylcholine from binding to receptors on the muscle. Similarly, naloxone binds to endorphin receptors and blocks the ability of drugs like heroin, oxycodone, or other opioid drugs from binding to these receptors.
14. The answer should include the following information: An antagonist is a chemical that blocks a receptors site on a cell. An example of an antagonist is the drug naloxone. It is an opioid antagonist that blocks endorphin receptors thereby reversing the effects of heroin, oxycodone, or other opioid drugs.
15. The answer should include the following information: Julian most likely has a serious brain disease called chronic traumatic encephalopathy (CTE). This condition, which is often caused by repeated concussions, is a progressive, degenerative brain disease that leads to dementia and death. Unfortunately, Julian's doctor will not be able to diagnose it, as CTE can only be diagnosed after death.
16. The answer should include the following information: Spinal reflexes are simple, automatic behaviors that occur without any brain involvement. An example of this reflex is the withdrawal reflex which occurs when a person touches a hot or sharp object. The reflex involves rapid communication among sensory neurons, interneurons in the spinal cord, and motor neurons that signal the muscles to react. These reflexes are crucial for survival since additional time to respond to a stimulus that involved the brain might cause serious injury.
17. The answer should include the following information: There are two primary subdivisions of the peripheral nervous system: the somatic nervous system and the autonomic nervous system. The somatic nervous system plays an important role in communication throughout the entire body by relaying sensory information received by

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sensory receptors in the periphery along sensory nerves to the central nervous system. This system also carries messages from the central nervous system along motor nerves to perform voluntary muscle movements. On the other hand, the autonomic nervous system regulates involuntary functions that require little conscious thought, such as heartbeat, blood pressure, breathing, and digestion.

18. The answer should include the following information: The involuntary functions regulated by the autonomic nervous system are controlled by two different branches of the system: the sympathetic and parasympathetic nervous systems. These systems offer opposing control of many of the same organs in your body. In general, the sympathetic nervous system arouses the body to expend energy (for "fight or flight") while the parasympathetic nervous system is involved in energy conservation. The sympathetic nervous system represents the body's emergency system that allows rapid activation of bodily systems in response to emergencies or threats in the environment. This system stimulates rapid heart rate, breathing, and bronchial dilation in the lungs; digestion and salivation are slowed or stopped, the pupils dilate and oxygen to the muscles and brain increases. On the other hand, the parasympathetic nervous system conserves bodily resources allowing one to "rest and digest." It calms the nervous system down following some type of emergency. The system causes declines in heart rate, breathing, and blood pressure, pupils constrict back to a more normal size, salivation, and digestion begin to increase.
19. The answer should include the following information: The transmission of information in the endocrine system is slow when compared to the nervous system. The system relies on the circulation of hormones to deliver chemical messages to a target organ. While neurons may transmit information on the order of milliseconds, the endocrine system may take a few seconds or longer to send a chemical message to a target organ.
20. The answer should include the following information: The hypothalamus serves as the main link between the endocrine system and the nervous system. The hypothalamus directly regulates the release of hormones by the pituitary gland, a pea-sized gland just under the brain. The pituitary hormones, in turn, regulate the production of other hormones by many of the glands in the endocrine system. Under the control of the hypothalamus, the pituitary gland controls hormone production in other endocrine glands. Oxytocin is another important hormone that is produced by the hypothalamus and released into the bloodstream by the pituitary gland. Oxytocin is related to breast-feeding and promotes bonding between reproductive partners and between parent and infant. In some instances, oxytocin may promote aggression or antisocial behavior.
21. The answer should include the following information: Phrenology was born in Germany in the mid-1800s from the mind of a physician, Franz Gall. Gall thought that the size and shape of the cortex were important variables after studying the anatomy of human and animal brains. He believed that variations in terms of size and shape of the cortex would be reflected on the skull as bumps. He visited prisons, hospitals, and schools to examine this perceived association between personal characteristics and any distinctive bulges or bumps on the person's skull. Over time, Gall developed elaborate maps showing the location of these personality characteristics (which he termed "faculties") that he believed were reflected in a person's skull. Although pseudoscientific in nature, phrenology stimulated the notion of localization of function. The idea here was that specific psychological and mental functions might be localized to specific brain regions.

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Nowadays, we use brain imaging techniques like PET scans and functional MRI to show that some cognitive and perceptual functions are associated with specific areas of the brain.

22. The answer should include the following information: The goal of the Human Connectome Project is to map the neural connections among the 100 billion neurons in the human brain. The project uses brain-imaging scans from hundreds of participants and combines the data into a three-dimensional map to determine connections among these neurons. These scans involve the use of a technique called diffusion spectrum imaging that tracks the movement of water molecules in brain tissue. This information allows neuroscientists to make three-dimensional images of these neural pathways or tracts that connect different areas of the brain. These tracts consist of myelinated axon bundles. These data are complex and require high power computers as well as large amounts of computer memory to process and store the information.
23. The answer should include the following information: The word neuroplasticity represents the notion that the brain is able to change function and structure in response to experience. There are two forms of plasticity. The first is called functional plasticity. This type of plasticity refers to the brain's ability to recover from brain damage by shifting these functions to undamaged areas of the brain. This process may require "relearning" common behaviors like walking, speaking, or reading. If the recovery process is successful, undamaged areas of the brain will allow recovery of these functions. The second type of plasticity is referred to as structural plasticity. This process involves physical changes in the structure of the brain following learning, environmental stimulation, and active engagement in activities. Even minor changes in the environment or one's behavior can induce structural changes in the brain.
24. The answer should include the following information: In a recent study (2012), researchers were able to detect tiny structural changes in the hippocampus after participants spent just two hours playing a new video game that involved spatial learning and memory. Therefore, you may experience slight changes in the brain after as few as two hours spent learning a challenging new skill. Other research demonstrates measurable structural changes after three months of practicing a new skill.
25. The answer should include the following information: There are three primary structures in the hindbrain: the medulla, the pons, and the cerebellum. The medulla is found directly above the spinal cord at the very base of the brain. Ascending sensory pathways and descending motor pathways cross over to the opposite side of the body at this level of the brain. The medulla also plays a fundamental role in essential life functions such as breathing, heart rate, and blood pressure. Additionally, the medulla controls important reflexes such as sneezing, coughing, swallowing, and vomiting. Damage to the medulla is likely to cause death. The pons is located above the medulla; it is a swelling of tissue that contains pathways to and from the cerebellum. This area is also important for the regulation of respiration. The cerebellum is essential for the maintenance of balance, muscle tone, and coordinated muscle movements. It is also involved in learning automatic movements and motor skills such as writing. If the cerebellum is damaged, typical movements such as walking will become jerky and uncoordinated. In the center of the medulla and the pons is located a diffuse network of neurons known as the reticular formation. This network of neurons, sometimes also called the reticular activating system, contains groups of specialized neurons that

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regulate attention and sleep.

26. The answer should include the following information: The midbrain is an important relay station that contains centers involved in the processing of auditory and visual sensory information. Auditory sensations from the left and right ears are processed through the midbrain, helping you orient toward the direction of a sound. The midbrain is also involved in processing visual information, including eye movements, helping you visually locate objects and track their movements. After passing through the midbrain level, auditory information and visual information are relayed to sensory processing centers farther up in the forebrain region. A midbrain area called the substantia nigra is involved in motor control and contains a large concentration of dopamine-producing neurons. Substantia nigra means "dark substance," and as the name suggests, this area is darkly pigmented. The substantia nigra is part of a larger neural pathway that helps prepare other brain regions to initiate organized movements or actions. In the section on neurotransmitters, the book noted that Parkinson's disease involves symptoms of abnormal movement, including difficulty initiating or starting a particular movement. Many of those movement-related symptoms are associated with the degeneration of dopamine-producing neurons in the substantia nigra.
27. The answer should include the following information: The cerebral hemisphere can be roughly divided into four regions, or lobes: these lobes are referred to as the temporal, occipital, parietal, and frontal lobes. The lobes are associated with specific functions. At the back of the brain, the occipital lobe contains the primary visual cortex and processes visual information. Near the temples, the temporal lobe contains the primary auditory cortex. This area is responsible for receiving and processing auditory information. At the top of the brain, the parietal lobe processes information from the body or somatosensory information. These sensations include touch, pressure, information from receptors in the muscles and joints, as well as temperature information. At the foremost area of the lobe is the somatosensory cortex. This band of tissue receives information from touch receptors in the skin. The hands and the face receive proportionally more representation in the cortex while other areas receive less. Finally, the frontal lobe is the largest lobe of the brain and is involved in planning, initiating, and executing voluntary movements. Like the somatosensory cortex, the primary motor cortex is a strip of tissue at the back of the frontal lobe, just in front of the somatosensory cortex. This area also has unequal representation. There are more neurons dedicated to movement of the face and hands than other areas of the body.
28. The answer should include the following information: The somatosensory cortex is a band of tissue at the front portion of the parietal lobe that receives input from touch receptors throughout of the body. While the entire body is represented, each part of the body's representation is not equivalent. Those body parts, like the hands and the face, that are more responsive to touch, are overrepresented in the somatosensory cortex. Other areas like your legs or arms have less representation
29. The answer should include the following information: The primary motor cortex is a band of tissue on the frontal lobe. The degree of representation on the primary motor cortex for a particular body part reflects the diversity and precision of its potential movements. Almost one-third of the primary motor cortex is devoted to the hands and another third is devoted to facial muscles. The disproportionate representation of these two body areas on the primary motor cortex is reflected in the human capacity to

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produce an extremely wide range of hand movements and facial expressions.

30. The answer should include the following information: The key structures of the limbic system include the following: hippocampus, amygdala, the thalamus, and the hypothalamus. The hippocampus is found in the temporal lobe. It plays an important role in the formation of new memories. The amygdala is important for processing emotional information such as fear and anger. The thalamus is an important relay station for all motor information and sensory information, with the exception of smell that passes through the cerebral cortex. This nucleus is also thought to be important for regulating levels of awareness, attention, motivation, and emotional aspects of sensations. Finally, the hypothalamus is involved in many different functions regulating the autonomic nervous system, including heart rate as well as blood pressure. It is also involved in the regulation of behaviors related to survival, like eating, drinking, frequency of sexual activity, fear, and aggression. It is also important for the regulation of sleep–wake cycles and other circadian rhythms of the body.
31. The answer should include the following information: The hypothalamus is involved in many different functions regulating the autonomic nervous system and heart rate as well as blood pressure. It is also involved in the regulation of behaviors related to survival, like eating, drinking, frequency of sexual activity, fear, and aggression. It is also important for the regulation of sleep–wake cycles and other circadian rhythms of the body.
32. The answer should include the following information: In general, male's brains tend to be larger than female's brains, but this is probably because their skull is also larger. Females tend to have a higher proportion of gray matter compared to males. Additionally, gray and white matter tend to be equally distributed in females whereas males tend to have more gray matter in the left hemisphere when compared to their right. The male brain also appears to be more asymmetrical and more lateralized than the female brain. There also appears to be more focused activation of specific brain regions in the right hemisphere for visual and spatial tasks in males. There is also evidence that contradicts some of these results.
33. The answer should include the following information: In the 1860s, Pierre Paul Broca, a French surgeon and neuroanatomist, treated patients with difficulty speaking but had no trouble with comprehension of spoken or written language. Autopsies of the patients showed consistent brain damage to the lower left frontal lobe. This area became known as Broca's Area. Similarly, Karl Wernicke, a German neurologist, reported that damage to another area in the left hemisphere produced difficulty understanding spoken or written communications. These patients could speak quickly and easily; however, their speech was consisted of meaningless words and/or nonsense syllables. Autopsies of these patients' brains showed consistent damage to the left temporal lobe. This area became known as Wernicke's area. These clinical cases provided compelling evidence that language and speech functions are localized to the left cerebral hemisphere. Similar lesions in the right hemisphere have no impact on language and speech.
34. The answer should include the following information: Lateralization of function refers to the idea that one hemisphere exerts more control over or is more involved in processing specific types of information. For example, Broca's and Wernicke's work suggested lateralization of speech function in virtually all right-handed and most left-handed research participants.

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35. The answer should include the following information: Cortical localization is the idea that there are regions of the brain that are specialized to perform specific functions. Evidence suggests that areas of the brain are specialized for the reception and production of language. This evidence also suggests another phenomenon—that of lateralization of function. In other words, not only is information processing localized in the brain, there is also lateralization of these functions such that language is processed in the left hemisphere.
36. The answer should include the following information: Roger Sperry**,** a psychologist and neuroscientist, along with his colleagues examined the abilities of split-brain patients to perceive words and images briefly displayed on a computer screen. A word or picture was shown to the left or right of the midpoint of the screen. Visual information to the right of the midpoint projects to the person's left hemisphere while similar presentation to the left of the midpoint results in information projected to the right hemisphere. Participants could then pick from several objects that were hidden behind the screen; they could feel the objects, but not see them. The image of a banana projected to the left of the midpoint could not be verbally identified since it went to the right, nonverbal hemisphere. If allowed to select from the objects behind the screen with their left hand, split-brain subjects would correctly select a banana since the left hand is controlled by the right hemisphere. This is the hemisphere that originally saw the image of the banana. These experiments by Sperry and colleagues reconfirmed the specialized nature of the left hemisphere in processing language that had originally been reported by Broca and Wernicke in the 1800s.
37. The answer should include the following information: No, Byron's parents are not correct. It is a myth that left-handers have a fundamentally different brain organization from right- handers. About 75 percent of left-handers are left-hemisphere dominant for language, just like right-handers. The remaining 25 percent are either right-hemisphere dominant for language or bilateral, using both hemispheres for speech and language functions.
38. The answer should include the following information: Extensive research has shown that enrichment has a positive effect on the brain; these environmental changes increase the number and length of dendrites and dendritic branches, as well as enlarge neurons and increase the number of glial cells. Synaptic connections between brain neurons are also enhanced. Conversely, impoverished environments have been shown to decrease synaptic connections. Enrichment has been reported to increase the number of synapses in the cortex by as much as 20 percent in young rats. Similar environmental changes have been shown to have a positive impact on older rat's brains as well. Further, enrichment has been shown to increase neurogenesis. The number of new neurons as well as the survival time of these cells has been positively impacted by enrichment. On the other hand, social isolation and stressful environments negatively impact neurogenesis. Overall, the changes observed in a brain exposed to an enriched environment result in increased processing and communication among neurons enhancing performance on learning and memory tasks.

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1. A neuroscientist would be MOST likely to study which of the following topics?
   A) how conflict affects marital happiness
   B) which psychological test would best predict job success
   C) the age at which children start losing their baby teeth
   D) brain development during adolescence

2. The branch of science that is concerned with the study of the nervous system, especially the brain, is called:
   A) nescience.
   B) neuroscience.
   C) myology.
   D) histology.

3. The branch of psychology that is focused on understanding the internal physical events and processes that correspond with our mental processes and behavior is called _____.
   A) biological psychology
   B) histological psychology
   C) mycological psychology
   D) forensic psychology

4. Psychologists are greatly interested in the biological basis of behavior. Which of the following questions reflects this interest?
   A) Why do people choose specific careers?
   B) Why do you get hungry?
   C) Why do some people use social media, while others dislike it?
   D) Why do people from different cultures have different values?

5. Neurons are:
   A) found in primates and humans, but not in other animals.
   B) cells that are highly specialized to receive and transmit information from one part of the body to another.
   C) found only in the spinal cord and bone marrow.
   D) highly specialized cells that produce myelin.

6. There are roughly _____ neurons in the human brain.
   A) 500,000
   B) 500 million
   C) 1 billion
   D) 100 billion

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7. Which of the following signal muscles to relax or contract?
   A) sensory neurons
   B) glial cells
   C) motor neurons
   D) epithelial cells

8. Information from specialized cells in the sense organs is conveyed to the brain by:
   A) sensory neurons.
   B) epithelial cells.
   C) motor neurons.
   D) hormones.

9. The three basic types of neurons are:
   A) glial cells, nodes of Ranvier, and myelin.
   B) dendritic neurons, axonal neurons, and body neurons.
   C) excitatory neurons, inhibitory neurons, and interneurons.
   D) sensory neurons, motor neurons, and interneurons.

10. _____ convey information about the environment from the sense organs to the brain, and _____ communicate information to the muscles and glands.
   A) Sensory neurons; glial cells
   B) Excitatory neurons; inhibitory neurons
   C) Sensory neurons; motor neurons
   D) Motor neurons; sensory neurons

11. The type of specialized cell whose main function is to communicate information between neurons is a(n):
   A) interneuron.
   B) glial cell.
   C) motor neuron.
   D) sensory neuron.

12. Most of the neurons in the human nervous system are:
   A) interneurons.
   B) motor neurons.
   C) sensory neurons.
   D) glial cells.

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13. Which of the following statements about the properties of neurons is TRUE?
    A) All neurons are the same size and shape.
    B) The size and shape of neurons vary a great deal, reflecting their specialized function.
    C) Sensory and motor neurons are the same size and shape, and interneurons are long and thin.
    D) Motor neurons outnumber interneurons by almost 10 to 1.

14. Along with neurons, the human nervous system is made up of _____ cells which greatly outnumber neurons by about 10 to 1.
    A) glial
    B) Ranvier
    C) dendritic
    D) polarized

15. Which of the following statements about glial cells is FALSE?
    A) Glial cells glue neurons together.
    B) There are several different kinds of glial cells, each with its own specialized function.
    C) Glial cells outnumber neurons by about 10 to 1.
    D) Glial cells provide structural support for neurons throughout the nervous system.

16. _____ remove waste products from the nervous system, including dead and damaged neurons.
    A) Microglia
    B) Astrocytes
    C) Oligodendrocytes
    D) Schwann cells

17. Which of the following is TRUE of glial cells?
    A) They assist neurons by providing structural support and by removing waste products.
    B) They are neurons that specifically signal muscles to relax or contract.
    C) They are neurons that are specialized for conveying information to the brain from receptor cells in the sense organs and internal organs.
    D) They are a type of neuron whose primary function is to communicate information from one neuron to the next.

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18. _____ provide connections between neurons and blood vessels.
    A) Microglia
    B) Astrocytes
    C) Oligodendrocytes
    D) Schwann cells

19. _____ provide connections between neurons and blood vessels and are involved in brain development and the communication of information among neurons.
    A) Microglia
    B) Astrocytes
    C) Oligodendrocytes
    D) Schwann cells

20. _____ are involved in brain development and the communication of information among neurons.
    A) Microglia
    B) Astrocytes
    C) Oligodendrocytes
    D) Schwann cells

21. The amount of information that a neuron can receive increases with the number of _____ that the neuron has.
    A) axons
    B) cell bodies
    C) glial cells
    D) dendrites and dendrite branches

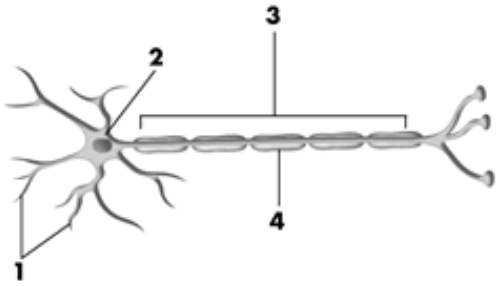
22. Which part of the neuron receives messages from other neurons?
    A) the axon
    B) the microglia
    C) the dendrite
    D) the sodium ion membrane

23. The cell body of a neuron:
    A) provides the energy needed for the neuron to function.
    B) manufactures myelin.
    C) is the long, fluid-filled tube that carries the neuron's message to other body areas.
    D) receives information directly from other neurons.

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24. Which of the following is TRUE about axons?
    A) Neurons that have a myelin sheath do not have an axon.
    B) Axons often have branches near their tips called axon terminals.
    C) Axon terminals receive information from other neurons and from sensory receptor cells.
    D) Unmyelinated axons fire 20 times faster than do axons with myelin sheaths.

25. This drawing shows the typical structures found on a neuron. Pick the alternative that correctly labels the structures in the drawing.



    A) 1 = dendrites, 2 = cell body, 3 = axon, 4 = myelin sheath
    B) 1 = axon terminals, 2 = dendrite, 3 = vesicles, 4 = synapse
    C) 1 = synaptic spines, 2 = glial cell, 3 = ion channels, 4 = node of Ranvier
    D) 1 = synaptic vesicles, 2 = ion channel, 3 = pons, 4 = axon

26. Neurons have all of the following parts, EXCEPT:
    A) association areas.
    B) a cell body and nucleus.
    C) dendrites.
    D) an axon.

27. The multiple short fibers that extend from the neuron's cell body and receive information from other neurons or from sensory receptor cells are called:
    A) dendrites.
    B) the nodes of Ranvier.
    C) synaptic vesicles.
    D) axons.

28. A neuron may have thousands of _____, but can have only one _____.
    A) dendrites; axon
    B) cell bodies; dendrite
    C) axons; dendrite
    D) node of Ranvier; synaptic vesicle

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29. The part of the neuron that carries messages to other cells in the body is the:
    A) dendrite.
    B) axon.
    C) nucleus.
    D) reticular formation.

30. Which statement most accurately describes the length of axons?
    A) Most axons are several feet long.
    B) Most axons are approximately one-tenth of an inch long.
    C) The length of axons can range from a few thousandths of an inch to 3 or 4 feet.
    D) The length of any particular axon changes depending upon whether muscles are stretched or clenched.

31. The nodes of Ranvier are:
    A) a type of neuron that communicates information from one neuron to another.
    B) the synaptic vesicles that contain neurotransmitters.
    C) the ion channels in the membrane of a neuron's axon that open and close during an action potential.
    D) small gaps in the myelin sheaths that cover some axons.

32. The primary function of the myelin sheath is to:
    A) reduce the speed of neurotransmitters crossing the synaptic gap.
    B) insulate the axon and increase the speed at which neurons convey their message.
    C) provide support and nutrition to the dendrites.
    D) inhibit the opening and closing of ion channels on the axon's membrane.

33. Compared to neurons whose axons are not wrapped in myelin, neurons whose axons are wrapped in myelin:
    A) are unable to communicate with other neurons.
    B) can communicate up to 50 times faster.
    C) use much more energy.
    D) do not have an axon.

34. Oligodendrocytes and Schwann cells form the _____, which is/are a fatty covering that is/are wrapped around the axons of some neurons.
    A) dendrites
    B) astrocytes
    C) myelin sheath
    D) microglia

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35. Multiple sclerosis is a disease that involves:
    A) the degeneration of patches of the myelin sheath that causes the transmission of neural messages to be slowed or interrupted.
    B) an abnormal increase in the thickness of the myelin sheath, blocking the release of neurotransmitters.
    C) the gradual decline in the ability of neurons to produce glial cells.
    D) dendrites becoming brittle and breaking.

36. As a general rule, communication within a neuron progresses from the:
    A) axon to the dendrites to the cell body.
    B) dendrites to the cell body to the axon.
    C) dendrites to the axon to the axon terminals and then to the cell body.
    D) cell body to the axon to the nucleus.

37. Information is transmitted along the axon:
    A) by glial cells.
    B) in the form of chemical messengers such as fructose.
    C) in the form of a brief electrical impulse.
    D) by chemical substances called neurotransmitters.

38. The action potential is best defined as:
    A) the amount of serotonin that can cross the axon's membrane.
    B) the +3- to +7-volt capacity of a typical motor neuron.
    C) the ability of a motor neuron to either contract or relax a muscle group.
    D) a brief electrical impulse that transmits information along the axon of a neuron.

39. The analogy used in the book referred to the axon membrane as a gatekeeper. This means that the membrane:
    A) determines whether a glial cell can pass through the axon.
    B) controls the balance of positive and negative ions on the interior and exterior of the axon.
    C) operates in an all-or-none fashion, either opening to allow neurotransmitters to pass or not.
    D) uses the nodes of Ranvier to allow some ions to move out of the axon and neurotransmitters to move into the axon.

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40. The stimulus threshold of the neuron refers to the:
    A) minimum level of stimulation required to activate a particular neuron.
    B) 3-to-1 ratio of positive-to-negative ions required for the neuron to transmit information to the next neuron.
    C) positive electrical charge on the neuron's interior just prior to neuron activation.
    D) minimum level of stimulation required to inhibit a neuron from firing.

41. When a neuron is polarized:
    A) the exterior fluid surrounding the neuron is more negatively charged than the interior of the neuron.
    B) an action potential will travel down the dendrites causing the release of neurotransmitters.
    C) the electrical charge across the neuron's membrane is balanced with the same charge outside as inside.
    D) the interior of the neuron's axon is more negatively charged than the exterior fluid surrounding the axon.

42. When a neuron is in the resting potential state:
    A) it is unable to activate.
    B) it has a negative electrical charge of about 7 volts.
    C) the fluid within the axon has a larger concentration of potassium ions than the fluid surrounding the axon.
    D) the ion channels are open.

43. The electrical charge of a neuron when it is in the resting potential state is about:
    A) +30 millivolts.
    B) –70 millivolts.
    C) +2 volts.
    D) –10 volts.

44. Which of the following is TRUE regarding action potentials?
    A) Partial action potentials result in fewer neurotransmitter molecules being released than whole action potentials.
    B) Action potentials operate under the "all-or-none law," which means that action potentials either move all sodium ions across the membrane or none of the sodium ions across the membrane.
    C) Once an action potential is started, it is self-sustaining and continues to the end of the axon.
    D) Action potentials regenerate themselves during their refractory periods when the axon membrane is depolarized.

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45. An action potential occurs when:
    A) sodium ions enter the axon's interior, causing a brief positive electrical impulse.
    B) potassium ions are electrically transformed into sodium ions.
    C) polarized dendrites stimulate adjoining nodes of Ranvier.
    D) potassium ions enter the dendrites and sodium ions exit the axon, causing depolarization and a brief negative electrical charge.

46. The action potential is produced by the:
    A) movement of neurotransmitters across the ion channels.
    B) opening and closing of the nodes in the myelin sheath.
    C) reuptake of the neurotransmitters into the vesicles.
    D) movement of ions across the membrane of the axon.

47. The all-or-none law refers to the fact that:
    A) the myelin sheath either completely covers an axon or it does not.
    B) the resting potential occurs only when the neuron is completely depolarized.
    C) either the neuron is sufficiently stimulated and an action potential occurs or it is not sufficiently stimulated and the action potential does not occur.
    D) a neurotransmitter is completely reabsorbed by the presynaptic neuron or it is dissolved in the synaptic gap.

48. Which of the following represents the sequence of ion movements that causes an action potential?
    A) Sodium ions move into the axon and then potassium ions move out of the axon.
    B) Sodium ions move out of the axon and then potassium ions move into the dendrite.
    C) Potassium ions move out of the dendrite and then sodium ions move into the axon.
    D) Sodium ions move out of the axon and then potassium ions move into the axon.

49. What is the result of sodium ions moving across the axon's membrane during an action potential?
    A) The inside of the axon changes to a negative electrical charge.
    B) The outside of the axon changes to a positive electrical charge.
    C) The inside of the axon changes to a positive electrical charge.
    D) The nodes of Ranvier close.

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50. What keeps an action potential continuing down an axon?
    A) At each successive segment of the axon, the action potential is regenerated by depolarization and the movement of ions across the axon's membrane.
    B) Neurotransmitters are constantly being released to generate the action potential at each successive segment of the axon.
    C) Action potentials are conducted down the axon just as electricity is conducted through a wire.
    D) Ion channels open and close at the nodes of Ranvier, allowing neurotransmitters to enter into the axon and regenerate an action potential at each node.

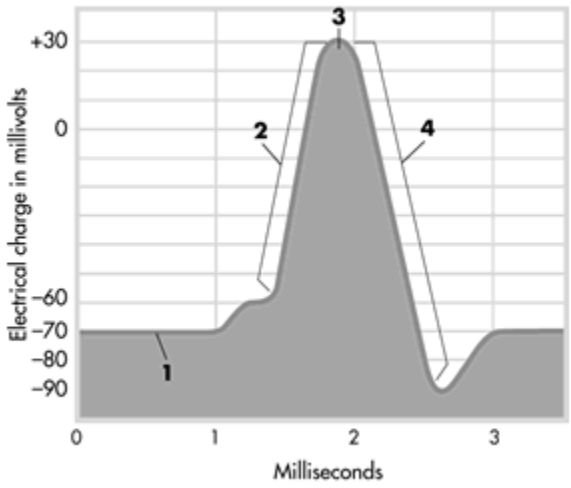
51. What occurs during the refractory period?
    A) The neuron depolarizes.
    B) Neurotransmitters are released by the dendrites.
    C) The charge of the neuron's interior increases to about +60 millivolts.
    D) The neuron reestablishes the negative-inside/positive-outside condition.

52. The fastest neurons in the human body communicate their messages at:
    A) the speed of light, or 186,000 miles per second.
    B) speeds up to 270 miles per hour.
    C) the speed of sound, or about 770 miles per hour.
    D) only about 10 miles per hour.

53. Which two factors affect the speed at which the action potential is conducted along a neuron's axon?
    A) the diameter of the axon and whether the axon is wrapped with a myelin sheath
    B) the number of dendrites and the size of the cell body
    C) the type and number of axons projecting from the neuron
    D) the size of the positive electrical charge just before an action potential occurs and the number of adjacent neurons

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54. The graph shows the changing electrical charge of a neuron when it activates. Pick the alternative that correctly labels the different phases depicted in the graph.



A) 1 = action potential, 2 = stimulus threshold, 3 = refractory period, 4 = resting potential
B) 1 = ions cross membrane, 2 = action potential, 3 = stimulus threshold, 4 = depolarization
C) 1 = depolarization, 2 = action potential, 3 = stimulus threshold, 4 = repolarization
D) 1 = resting potential, 2 = ions cross membrane, 3 = action potential, 4 = refractory period

55. How are action potentials different in a myelinated axon and an unmyelinated axon?
A) Action potentials are slower in myelinated axons because the myelin sheath interferes with the transfer of ions across the membrane.
B) Action potentials "jump" from node to node in myelinated axons rather than progressing down the entire length of the axon.
C) Action potentials have greater electrical charges in myelinated axons.
D) Action potentials in myelinated axons operate according to the "all-or-none law" but action potentials in unmyelinated axons do not.

56. Communication between two neurons occurs at the:
A) nucleus.
B) node of Ranvier.
C) ion channel.
D) synapse.

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57. Presynaptic neuron is to postsynaptic neuron as:
    A) synapse is to neurotransmitters.
    B) receptors are to neurotransmitters.
    C) electrical communication is to chemical communication.
    D) message-sending neuron is to message-receiving neuron.

58. The most common form of communication between neurons is:
    A) chemical.
    B) electrical.
    C) magnetic.
    D) hormonal.

59. Which of the following BEST defines a neurotransmitter?
    A) a chemical messenger that crosses the synaptic gap between neurons
    B) an electrical impulse that crosses the synaptic gap between neurons
    C) a chemical communicator manufactured by glial cells
    D) a microscopic channel through which sodium and potassium ions pass

60. Synaptic vesicles contain:
    A) hormones.
    B) ions.
    C) neurotransmitters.
    D) receptors.

61. In synaptic transmission, the action potential stimulates the release of:
    A) potassium ions by the glial cells.
    B) neurotransmitters by the synaptic vesicles.
    C) myelin by the glial cells.
    D) sodium ions by the dendrites.

62. What happens to the neurotransmitters that fail to attach to a receptor site?
    A) In a process called reuptake, they are reabsorbed by the sending neuron and recycled.
    B) They bind with potassium ions.
    C) They are destroyed by glial cells.
    D) In a process called depolarization, they are neutralized by negative ions.

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63. Which of the following statements is FALSE?
    A) A given neuron can have thousands of synapses with other neurons.
    B) Some neurons can manufacture three or more different types of neurotransmitters.
    C) Synaptic vesicles are released into the synaptic gap, then "dock" with the adjoining neurons.
    D) It only takes a few millionths of a second for neurotransmitters to cross the synaptic gap.

64. Like a key in a lock, the shape of the _____ must fit the _____ to affect the postsynaptic neuron.
    A) dendrite; axon terminal
    B) cell body; axon terminal
    C) neurotransmitter; receptor site
    D) synaptic vesicle; receptor site

65. When neurotransmitters communicate an excitatory message to the postsynaptic neuron:
    A) the postsynaptic neuron is more likely to generate an action potential.
    B) the presynaptic neuron is more likely to generate an action potential.
    C) the action potential is canceled out.
    D) reuptake is inhibited.

66. When a neurotransmitter communicates an inhibitory message to a postsynaptic neuron, the _____ likely to have an action potential.
    A) postsynaptic neuron is more
    B) postsynaptic neuron is less
    C) presynaptic neuron is more
    D) presynaptic neuron is less

67. On average, each neuron in the brain communicates directly with _____ other neurons.
    A) 100
    B) 100 billion
    C) 100 trillion
    D) 1,000

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68. Neurotransmitters:
    A) are chemical messengers that are secreted into the bloodstream primarily by endocrine glands.
    B) are present in extremely small quantities in the brain.
    C) are constantly changing their basic molecular shape as the human brain adapts to new experiences.
    D) compete with sodium and potassium ions for the receptor sites on the surrounding neurons.

69. A particular neurotransmitter:
    A) always communicates either an excitatory or inhibitory effect.
    B) can have different effects, depending upon the receptor site to which it attaches.
    C) can be located in the central nervous system or the peripheral nervous system but not both.
    D) can attach to any available receptor site on adjacent neurons.

70. The neurotransmitter called acetylcholine:
    A) is found in all sensory neurons.
    B) is involved in muscle contractions and memory.
    C) causes hallucinations when present in excessive amounts.
    D) is chemically identical to heroin.

71. Acetylcholine is:
    A) found in sensory neurons but not motor neurons.
    B) involved in movement and memory.
    C) manufactured by glial cells.
    D) dramatically decreased in the brains of people with Parkinson's disease.

72. Which of the following neurotransmitters is involved in physical arousal, learning, memory, and regulation of sleep?
    A) acetylcholine
    B) dopamine
    C) serotonin
    D) norepinephrine

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73. For the past year, 30-year-old Kendra has experienced difficulty falling and staying asleep, and she frequently complains that she has difficulty remembering certain things, such as where she put her keys or an upcoming dentist or doctor's appointment. Kendra says she's stressed and was recently diagnosed with depression. Kendra probably has a deficiency in the neurotransmitter:
    A) pectin.
    B) norepinephrine.
    C) pepsin.
    D) glutamate.

74. The neurotransmitter _____ is responsible for sending excitatory messages and is related to seizures and Alzheimer's disease.
    A) dopamine
    B) norepinephrine
    C) GABA
    D) glutamate

75. Kadeem has been diagnosed with generalized anxiety disorder and obsessive compulsive disorder. Which of the following neurotransmitters is associated with these anxiety disorders?
    A) pepsin
    B) glucose
    C) GABA
    D) microglia

76. All motor neurons have:
    A) acetylcholine.
    B) dopamine.
    C) serotonin.
    D) L-dopa.

77. Which of the following neurotransmitters is implicated in Alzheimer's disease?
    A) pepsin
    B) axilla
    C) acetylcholine
    D) cervicis

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78. Rachel had injections of Botox in an attempt to eliminate facial wrinkles. Botox contains minute amounts of botulin, an extremely lethal substance produced by bacteria, and works by blocking the release of a specific neurotransmitter from motor neurons, causing muscle paralysis. This neurotransmitter, found in all motor neurons, is called:
A) dopamine.
B) serotonin.
C) acetylcholine.
D) GABA.

79. Too little dopamine in the brain is associated with symptoms of:
A) schizophrenia.
B) Parkinson's disease.
C) anxiety.
D) Alzheimer's disease.

80. Evidence suggests that the addictiveness of some drugs, including cocaine and nicotine, is related to increases in the activity of which of the following neurotransmitters?
A) dopamine
B) pepsinogen
C) acetylene
D) propene

81. Parkinson's disease is caused by the degeneration of neurons that produce:
A) lysine.
B) propene.
C) dopamine.
D) chlorine.

82. _____ is to Alzheimer's disease as _____ is to Parkinson's disease.
A) Dopamine; serotonin
B) Acetylcholine; dopamine
C) Serotonin; norepinephrine
D) Norepinephrine; serotonin

83. The drug called L-dopa:
A) is used to treat people suffering from schizophrenia.
B) blocks pain signals.
C) is found in all sensory neurons.
D) converts to dopamine in the brain.

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84. Former heavyweight boxer Muhammad Ali suffers from symptoms that are very similar to Parkinson's disease. He sometimes experiences muscle tremors and has difficulty initiating movements or speech. To help reduce these symptoms, Ali takes a drug called:
    A) naloxone.
    B) atropine.
    C) L-dopa.
    D) morphine.

85. Like other people afflicted with _____, actor Michael J. Fox takes a medication that increases _____ levels to help control symptoms of the disease.
    A) Alzheimer's disease; GABA
    B) major depressive disorder; serotonin
    C) obsessive-compulsive disorder; GABA
    D) Parkinson's disease; dopamine

86. Over the course of several months and for no apparent reason, Jennifer became progressively more despondent, withdrawn, and listless. Her doctor accurately diagnosed the problem as major depressive disorder and started Jennifer on an antidepressant drug called Prozac. Three weeks later, Jennifer showed much improvement. Like some other antidepressant drugs, Prozac works by _____ the availability of _____ in the brain.
    A) increasing; serotonin
    B) decreasing; dopamine
    C) increasing; endorphins
    D) decreasing; acetylcholine

87. Which of the following drugs is chemically similar to the endorphins?
    A) curare
    B) morphine
    C) L-dopa
    D) botox

88. Which of the following is one of the phenomena mentioned in the text that is associated with increased endorphin levels?
    A) addiction to nicotine
    B) muscle spasms during aerobic exercise
    C) the pain-relieving effects of acupuncture
    D) the relaxation produced by drinking alcohol

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89. After surgery, physicians may prescribe a medication to relieve pain. Such a medication would most likely mimic the effects of:
    A) pepsin.
    B) endorphins.
    C) serotonin.
    D) GABA.

90. Miguel jogs about 5 miles a day. At roughly the three-mile point, Miguel usually experiences a rush of positive feelings due to _____ levels of _____.
    A) decreased; norepinephrine
    B) increased; insulin
    C) increased; endorphins
    D) decreased; GABA

91. The rush of euphoria that many people experience after sustained exercise, especially cardio-based activity, is called:
    A) neurogenesis.
    B) the "synaptic rush."
    C) the "split-brain" high.
    D) the "runner's high."

92. Randy exercises more than most people and continues to train even when he has a cold or an injury. His friends joke that Randy seems addicted to exercise. Randy's compulsive exercising:
    A) may be due to the involvement of his brain's opioid system and the production of endorphins.
    B) is a definite indicator of decreased levels of dopamine and increased risk of Parkinson's disease.
    C) may be due to the involvement of his limbic system and the production of acetylcholine by his adrenal glands.
    D) is a definite indicator of the overproduction of dopamine and an increased risk of schizophrenia.

93. Researchers using PET scans to study the opioid system in long-distance runners are likely to find increased brain levels of _____ following a long run.
    A) pepsin
    B) endorphins
    C) prolactin
    D) insulin

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94. How does cocaine achieve its effects?
    A) It mimics dopamine.
    B) It interferes with the reuptake of dopamine.
    C) It mimics serotonin.
    D) It blocks the reuptake of endorphins.

95. Which of the following drugs mimics the neurotransmitter acetylcholine?
    A) Prozac
    B) L-dopa
    C) nicotine
    D) morphine

96. During a rest stop while hiking, Phil was bitten by a black widow spider. Shortly after being bitten he started having breathing difficulties and then experienced muscle spasms. The symptoms he experienced occurred because the black widow spider's venom:
    A) blocked acetylcholine receptor sites on motor neurons.
    B) blocked the release of serotonin from sending neurons.
    C) shut down the functioning of the substantia nigra in Phil's brain.
    D) caused acetylcholine to be continuously released by the motor neurons.

97. Which of the following is NOT one of the ways discussed in the text that drugs can interfere with synaptic transmission?
    A) by blocking a receptor site and preventing the neurotransmitter from acting
    B) by mimicking a particular neurotransmitter and producing the same effect
    C) by increasing the length of time a neurotransmitter remains in the synaptic gap, strengthening its effects
    D) by bonding with the neurotransmitter and changing its molecular weight and shape

98. An _____ is a drug or other chemical that binds to a receptor site and triggers a response in the cell.
    A) antagonist
    B) endorphin
    C) agonist
    D) opiate

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99. An agonist is a drug or other chemical that:
    A) blocks a receptor site and inhibits or prevents a response in the receiving cell.
    B) binds to a receptor site and triggers a response in the cell.
    C) is released in response to stress or trauma and reduces the perception of pain.
    D) blocks the reuptake of serotonin, increasing its effect.

100. Nicotine binds to acetylcholine receptor sites, stimulating skeletal muscles and causing the heart to beat more rapidly. Thus, nicotine is a(n):
    A) endorphin.
    B) SSRI.
    C) agonist.
    D) antagonist.

101. Prozac and cocaine are very different drugs, but they achieve their effects through the same mechanism of action. What is that mechanism?
    A) Both drugs block GABA.
    B) Both drugs mimic GABA.
    C) Both drugs interfere with the reuptake of certain neurotransmitters.
    D) Both drugs occupy the receptor sites for opiates.

102. Some native peoples of South America use the drug curare to poison the tips of their hunting arrows. When an animal is struck by the arrow it goes limp and quickly suffocates. Why?
    A) Serotonin floods into the synaptic gap.
    B) Dopamine reuptake is blocked.
    C) Acetylcholine receptor sites are blocked.
    D) Endorphin receptor sites are destroyed.

103. An _____ is a drug or other chemical that blocks a receptor site and inhibits or prevents a response in the receiving cell.
    A) antagonist
    B) endorphin
    C) agonist
    D) opiate

104. An antagonist is a drug or other chemical that:
    A) blocks a receptor site and inhibits or prevents a response in the receiving cell.
    B) binds to a receptor site and triggers a response in the cell.
    C) is released in response to stress or trauma and reduces the perception of pain.
    D) blocks the reuptake of serotonin, increasing its effect.

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105. The drug curare blocks acetylcholine receptor sites, causing virtually instantaneous paralysis. Thus, curare is a(n):
A) endorphin.
B) SSRI.
C) agonist.
D) antagonist.

106. The drug naloxone acts as an _____ at opioid receptor sites and eliminates the effects of both endorphins and opiates.
A) endorphin
B) SSRI
C) agonist
D) antagonist

107. Because it is an opioid _____, naloxone prevents or reverses the effects of opioid drugs and can be used to treat an overdose of heroin or similar drugs.
A) endorphin
B) SSRI
C) agonist
D) antagonist

108. The two main divisions of the nervous system are the _____ and the _____.
A) peripheral nervous system; central nervous system
B) central nervous system; autonomic nervous system
C) brain; spinal cord
D) autonomic nervous system; somatic nervous system

109. In combination, the brain and spinal cord make up the _____nervous system.
A) peripheral
B) autonomic
C) central
D) somatic

110. Nerves are made up of:
A) bundles of axons.
B) dendritic fibers.
C) bundles of cell bodies.
D) glial cells.

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111. Surrounding and protecting the brain and the spinal cord are three layers of membranous tissues called the:
A) neural stem cells.
B) meninges.
C) ventricles.
D) neurons.

112. What is a function of cerebrospinal fluid?
A) It protects the central nervous system from being jarred.
B) It promotes the release of hormones in the brain.
C) It can function as a neurotransmitter in times of severe stress.
D) It is the communication link between the central nervous system and the peripheral nervous system.

113. There are four hollow cavities in the brain called _____, which are filled with cerebrospinal fluid and whose inner surfaces are lined with _____, specialized cells that generate neurons in the developing brain.
A) neural pathways; neurogenetic cells
B) ventricles; neural stem cells
C) synaptic vesicles; myelin
D) axon terminals; GABA

114. The most common type of brain injury is _____.
A) a concussion
B) whiplash
C) an aneurism
D) chronic traumatic encephalopathy

115. According to the In Focus box: Traumatic Injury: From Concussions to Chronic Traumatic Encephalopathy, professional athletes, particularly football and hockey players, are at risk for:
A) early-onset schizophrenia.
B) permanent amnesia.
C) chronic traumatic encephalopathy.
D) imbalances in neurotransmitters, such as dopamine.

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116. When Elisa goes to the doctor for her annual physical, the doctor taps directly below her kneecap, which causes her leg to jerk forward. Elisa's doctor is testing her:
A) overall central nervous system.
B) somatic nervous system.
C) bone health.
D) spinal reflexes.

117. Professor Romero discovered that the overhead projector in her classroom had a short in the wiring system. When she touched the metal edge of the projector, she got an electric shock and instantly jerked her hand back. This instantaneous reaction is an example of:
A) aphasia.
B) hemispheric specialization.
C) the brain's structural plasticity.
D) a spinal reflex.

118. In the _____system, information is communicated along nerves.
A) central nervous
B) peripheral nervous
C) limbic
D) endocrine

119. Thomas was distracted as he was cooking and he inadvertently touched a very hot dish. Instantaneously he jerked his hand back, a reflexive action that was processed:
A) in his spinal cord.
B) simultaneously in his spinal cord and brain.
C) first in his brain, then a moment later in his spinal cord.
D) with no involvement of the central nervous system.

120. The peripheral nervous system is made up of:
A) the brain.
B) the brain and the spinal cord.
C) all the nerves lying outside the central nervous system.
D) motor neurons.

121. The two main subdivisions of the peripheral nervous system are the _____ nervous system and the _____ nervous system.
A) sympathetic; parasympathetic
B) somatic; autonomic
C) autonomic; sympathetic
D) parasympathetic; somatic

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122. As you are taking a test, you inadvertently drop your pencil, reach down, pick it up, and put it back on the desk. This voluntary action involved motor signals that were communicated out to your muscles via the _____ nervous system.
A) autonomic
B) sympathetic
C) parasympathetic
D) somatic

123. As you are walking on a beach, you pick up an odd-looking seashell that has a very rough texture. As you rub your fingers over the shell, the sensory messages are communicated via the _____ nervous system to the central nervous system.
A) somatic
B) autonomic
C) sympathetic
D) parasympathetic

124. While taking this test, you have probably paid little attention to ongoing body functions, such as breathing, heartbeat, and digestion. Such involuntary bodily functions are governed by the:
A) somatic nervous system.
B) cerebrospinal fluid.
C) spinal reflexes.
D) autonomic nervous system.

125. Paul was awakened by a thumping noise in the middle of the night. Frightened, he jumped out of bed to investigate. Hearing a muffled meow, Paul realized that his cat was shut in the closet and was pushing against the door. Breathing a sigh of relief, Paul let the cat out of the closet and went back to bed. Which subdivision of the nervous system helped calm down and restore Paul's body functioning back to normal?
A) parasympathetic
B) endocrine
C) sympathetic
D) somatic

126. The heightened physical arousal that characterizes the fight-or-flight response involves the _____ branch of the nervous system.
A) spinal
B) somatic
C) sympathetic
D) parasympathetic

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127. In general, the sympathetic nervous system _____, while the parasympathetic nervous system _____.
    A) arouses and mobilizes; maintains and conserves
    B) transmits sensory information; transmits motor information
    C) maintains and conserves; arouses and mobilizes
    D) transmits motor information; transmits sensory information

128. Maria heard a strange banging noise just outside her bedroom window in the middle of the night. She froze in fear and her heart began to pound. Maria's heightened physical arousal involved the activation of which subdivision of the nervous system?
    A) endocrine
    B) parasympathetic
    C) sympathetic
    D) reticular

129. The endocrine system involves communication by chemical messengers called _____, which circulate through the _____.
    A) hormones; bloodstream
    B) neurotransmitters; spinal cord
    C) hormones; cerebrospinal fluid
    D) endorphins; nervous system

130. How does communication in the endocrine system differ from communication in the nervous system?
    A) Communication in the nervous system is slower than communication in the endocrine system.
    B) Communication in the endocrine system is slower than communication in the nervous system.
    C) Endocrine system cells can receive messages but cannot transmit messages.
    D) While both inhibitory and excitatory messages can be transmitted by cells in the nervous system, endocrine system cells can only transmit excitatory messages.

131. The main link between the nervous system and the endocrine system is the:
    A) adrenal cortex.
    B) hypothalamus.
    C) pineal gland.
    D) pancreas.

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132. Which gland produces melatonin, a hormone that helps to regulate our sleep–wake cycle?
A) the pineal gland
B) the pituitary gland
C) the pancreas
D) the thyroid gland

133. The _____ is produces melatonin which helps regulate sleep–wake cycles, and the _____ regulates blood sugar levels and is involved in hunger.
A) thyroid gland; pituitary gland
B) pineal gland; pancreas
C) adrenal gland; pineal gland
D) pancreas; thyroid gland

134. Which gland directly regulates the production of hormones in other endocrine glands?
A) the adrenal gland
B) the thyroid gland
C) the pituitary gland
D) the pancreas

135. Prolactin is a hormone _____ produced by the _____.
A) neurotransmitters; synaptic vesicles
B) hormones; pituitary gland
C) neurotransmitters; adrenal glands
D) hormones; adrenal glands

136. The adrenal glands produce hormones that are involved in:
A) reproduction.
B) stress response.
C) temperature regulation.
D) sleep.

137. The adrenal glands consist of the adrenal cortex, which is the _____ gland, and the adrenal medulla, which is the _____ gland.
A) inner; outer
B) outer; inner
C) functional; vestigial
D) secreting; communication

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138. Your adrenal cortex and adrenal medulla produce hormones that are involved in your _____ response.
A) sexual
B) intellectual
C) stress
D) sleep

139. Another word for epinephrine is:
A) adrenaline.
B) progesterone.
C) glutamate.
D) testosterone.

140. The physical arousal that accompanies the fight-or-flight response involves the activation of which of the following endocrine glands?
A) the testes in males and the ovaries in females
B) the pineal gland
C) the thyroid gland
D) the adrenal medulla

141. In males, the gonads are the _____, which secrete _____.
A) ovaries; androgens, including testosterone
B) testes; androgens, including testosterone
C) ovaries; estrogen and progesterone
D) testes; estrogen and progesterone

142. In females, the gonads are the _____, which secrete _____.
A) ovaries; testosterone
B) testes; testosterone
C) ovaries; estrogen and progesterone
D) testes; estrogen and progesterone

143. Phrenology is:
A) the scientific study of brain/endocrine system interactions.
B) a pseudoscience that related personality characteristics to bumps on the skull.
C) the historical method of drilling holes in the skull as a treatment for brain disease and mental illness.
D) the scientific study of "phrens" or "phrenetics."

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144. The popularity of phrenology triggered scientific interest in which of the following?
A) the idea that the brain's left hemisphere might be specialized for language functions
B) the development of medications to treat severe mental disorders
C) cutting the corpus callosum to reduce epileptic seizures
D) the idea that specific psychological and mental functions are located in specific brain areas

145. Although disproved, phrenology was valuable in:
A) generating interest in the idea of cortical localization.
B) stressing the role of nutrition in endocrine and brain disorders.
C) emphasizing the importance of hormones in human behavior.
D) inspiring modern methods of treating brain disease and mental disorders.

146. The Human Connectome Project has an ambitious goal to:
A) sequence the human genome.
B) map the millions of miles of neural connections among the 100 billion neurons in the human brain.
C) determine how each human is genetically related.
D) connect human research to animal research.

147. Launched in 2009 by the National Institutes of Health, the Human Connectome project aims to:
A) sequence the human genome.
B) determine how each human is genetically related.
C) connect human research to animal research.
D) form a three-dimensional map of the brain's information highways.

148. A new brain-scanning technique called _____ allows neuroscientists to produce three-dimensional images of the neural pathways that connect one part of the brain to another.
A) functional magnetic resonance imaging
B) positron emission tomography
C) diffusion spectrum imaging
D) x-ray computerized tomography

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149. A new brain-scanning technique called diffusion spectrum imaging allows neuroscientists to:
    A) produce three-dimensional images of the neural pathways that connect one part of the brain to another.
    B) use electromagnetic techniques to examine blood flow in the brain.
    C) trace the metabolism of radioactive glucose in the brain.
    D) examine the structure of the brain using combined X-rays.

150. Diffusion spectrum imaging can produce three-dimensional images of the neural pathways that connect one part of the brain to another. These neural pathways are sometimes called:
    A) diffusions.
    B) tracts.
    C) spectrums.
    D) voxels.

151. Diffusion spectrum imaging tracks the:
    A) changes in blood flow due to neural activity.
    B) electrical activity of neurons produced by postsynaptic potentials.
    C) magnetic fields produced by action potentials of neurons.
    D) movement of water molecules in brain tissue along the axons.

152. Diffusion spectrum imaging can produce three-dimensional images of the neural pathways that connect one part of the brain to another. These neural pathways, sometimes called tracts, are made up of:
    A) cell bodies of neurons.
    B) astrocytes.
    C) dendrites of neurons.
    D) myelinated axons.

153. As you're eating lunch with a friend, you reach for your glass of water with your right hand, lift it to your lips, take a sip, and then set it down. This simple task involved:
    A) only the primary motor cortex in the brain.
    B) neuroplasticity.
    C) multiple brain structures and regions communicating via neural pathways.
    D) just the right hemisphere of the brain.

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154. Although your text talks about brain centers and structures that are involved in different aspects of behavior, the best way to think of the brain is as a(n):
A) integrated system.
B) neural network.
C) computer memory device.
D) neural pathway.

155. Many brain functions involve the activation of _____ that link different brain regions.
A) hormones
B) reflexes
C) neural pathways
D) nerves

156. The brain's ability to change function and structure is referred to as:
A) synaptic transmission.
B) neurogenesis.
C) neuroplasticity.
D) cortical localization.

157. Neuroplasticity, or simply plasticity, refers to the brain's ability to:
A) generate new neurons.
B) change function and structure.
C) change structure but not function.
D) change function but not structure.

158. Functional plasticity:
A) produces aphasia or paralysis.
B) has been demonstrated in research with primates but not with humans.
C) refers to the brain's ability to shift functions from damaged to undamaged areas of the brain.
D) can only occur in children prior to about the age of seven.

159. Jake sustained a severe brain injury in a motorcycle accident and was partially paralyzed on the left side of his body. After several months of intensive physical therapy, he gradually regained the use of his left leg and arm. This example BEST illustrates the principle of:
A) aphasia.
B) cortical localization.
C) functional plasticity.
D) neurogenesis.

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160. The brain's ability to physically change in response to environmental stimulation is called:
A) aphasia.
B) neurogenesis.
C) structural plasticity.
D) functional plasticity.

161. The brain's ability to shift functions from damaged to undamaged areas is called:
A) aphasia.
B) neurogenesis.
C) structural plasticity.
D) functional plasticity.

162. Juliana began taking violin lessons as a young child. As a teenager she participated in a research study in which MRI scans of teenagers who had played the violin for several years were compared to MRI scans of other teenagers who had never played a musical instrument. The MRI scans of the teenage violinists showed that brain regions devoted to control of the fine muscles of the hands and fingers were larger in the teenage musicians than in the nonmusicians. This example illustrates the important phenomenon of:
A) muscular atrophy.
B) structural plasticity.
C) lateralization of function.
D) myelin regrowth.

163. The notion of structural plasticity:
A) has been demonstrated in animal studies but there is no evidence for structural plasticity in humans.
B) is the idea that learning, active practice, or environmental stimulation can cause physical changes in the brain's structure.
C) led to the idea of surgically cutting the corpus callosum as a possible treatment for severe cases of epilepsy.
D) is the idea that the brain has the ability to shift functions from damaged to undamaged brain areas.

164. Which of the following best defines neurogenesis?
A) the development of new neurons
B) the first neuron to generate an action potential
C) the influence of neurons on the formation of new genes
D) the influence of genes on the firing rate of neurons

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165. In what area of the adult primate brain have researchers found evidence of the growth of new neurons?
    A) the pons
    B) the hippocampus
    C) the medulla
    D) the thalamus

166. In studies with primates, specifically macaque monkeys, psychologist Elizabeth Gould and her colleagues found evidence:
    A) of limited neurogenesis in brain stem structures but not in more sophisticated brain regions.
    B) for structural plasticity but not functional plasticity.
    C) that new neurons develop and migrate to multiple brain regions.
    D) for functional plasticity but not structural plasticity.

167. Stress, exercise, and environmental complexity have been shown to affect the rate of _____ in the brains of monkeys, rodents, and birds.
    A) neurogenesis
    B) isomerization
    C) pigmentation
    D) defibrillation

168. Which of the following is TRUE regarding the development and growth of new neurons in the human brain?
    A) Animals such as primates, birds, and rodents do not experience neurogenesis.
    B) Glial cells of human brains continue to reproduce and grow in number through adulthood but neurons do not.
    C) The human brain has the capacity to generate new neurons throughout its lifespan.
    D) There is no evidence that the human brain continues to develop new neurons after birth.

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169. German researchers conducted a study investigating what happens to the brain when we learn a new, challenging skill. Participants learned to juggle and then had brain scans taken using MRI. What changes did the MRI scans reveal?
    A) a 3 to 4 percent increase in gray matter in two brain regions involved in perceiving, remembering, and anticipating complex visual motions
    B) a 3 to 4 percent increase in white matter in a brain region involved in kinesthetic sense
    C) a 3 to 4 percent decrease in white matter in two brain regions involved in perceiving, remembering, and anticipating complex motions
    D) There were no brain changes identifiable in the scans.

170. At 70 years old, Alice decided to take up juggling. According to research described in a Focus on Neuroscience feature, what kind of brain changes might result from Alice's new hobby?
    A) increased complexity in the corpus callosum
    B) gray matter increases in brain regions involved in perceiving and anticipating complex visual motions
    C) damage to the cerebellum
    D) No changes would result; plasticity has not been demonstrated in the aging brain.

171. A Focus on Neuroscience section in the text described a research study involving participants who learned how to juggle. What was the purpose of the study?
    A) to test the effects of enriched environments on balance and motor skills
    B) to compare the motor skills of jugglers versus nonjugglers
    C) to determine whether learning a new skill caused structural changes in the brain
    D) to determine whether juggling involves primarily the left or the right cerebral hemisphere

172. One of the Focus on Neuroscience sections in the text described a study in which German neuroscientists studied people who learned to juggle. One of the findings of the study was that:
    A) specific brain regions increased in size by 3 to 4 percent in the nonjugglers but did not change in the jugglers.
    B) specific brain regions increased in size by 3 to 4 percent in the jugglers but did not change in the nonjugglers.
    C) gray matter in two regions in the brains of novice jugglers decreased by 3 to 4 percent after seven days of daily practice.
    D) gray matter in two regions in the brains of seniors who learned to juggle decreased by 3 to 4 percent after seven days of daily practice.

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173. A Focus on Neuroscience section in the text described a research study involving participants who learned how to juggle. What was the main conclusion of the research?
A) that learning and practicing a new skill had distinct physical effects on specific brain structures
B) that jugglers, as compared to nonjugglers, were more likely to show evidence of neurogenesis in the corpus callosum
C) that learning how to juggle helped the participants become more creative by enhancing their right-brain abilities
D) that jugglers, as compared to nonjugglers, had higher levels of endorphins

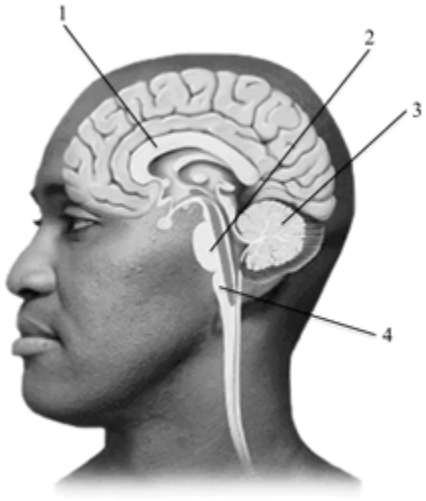
174. The brainstem is made up of the _____ and the _____.
A) forebrain; midbrain
B) cerebellum; medulla
C) reticular formation; the pons
D) midbrain; hindbrain

175. Following a severe motor vehicle accident, Braxton's family noticed that he had an awkward gait. For instance, he would lean slightly to one side when walking, often bumped into walls, and frequently lost his balance. Braxton MOST likely suffered damage in the:
A) forebrain.
B) corpus callosum.
C) cerebellum.
D) medulla.

176. The right side of the brain controls movements on the left side of the body, such as the ability to kick your left leg. Where do the outgoing motor messages cross over?
A) at the forebrain level
B) at the midbrain level
C) in the spinal cord
D) at the hindbrain level

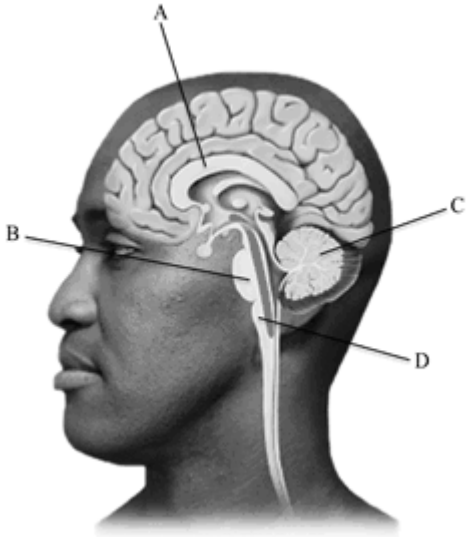
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177. This cross-section of the human brain depicts several key structures. Pick the alternative that correctly labels the structures in the drawing.



A) 1 = hypothalamus, 2 = nucleus, 3 = axon, 4 = myelin sheath
B) 1 = corpus callosum, 2 = pons, 3 = cerebellum, 4 = medulla
C) 1 = hippocampus, 2 = reticular formation, 3 = medulla, 4 = spinal cord
D) 1 = thalamus, 2 = hypothalamus, 3 = pons, 4 = brain stem

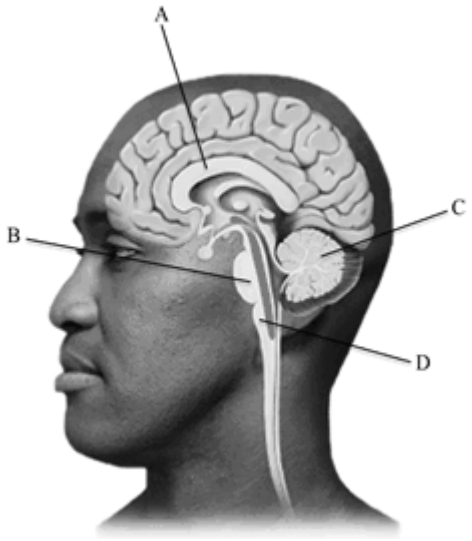
178. Which letter points to the brain structure that controls vital life functions, such as breathing, heartbeat, and digestion?



A) corpus callosum
B) pons
C) cerebellum
D) medulla

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179. Which letter points to the brain structure that plays a key role in controlling balance, muscle tone, and coordinated movements?



A) corpus callosum
B) pons
C) cerebellum
D) medulla

180. Which of the following is NOT a hindbrain structure?
A) hypothalamus
B) pons
C) medulla
D) cerebellum

181. The chapter prologue described the story of a young university professor named Asha, who suffered a stroke. Because Asha experienced some damage to the motor areas on the left side of her brain, she experienced:
A) muscle weakness on the left and right sides of her body.
B) muscle weakness only on the right side of her body.
C) no muscle impairment.
D) muscle weakness only on the left side of her body.

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182. As you are listening to a lecture, workers are repairing a wall just outside your classroom. Throughout the class, you find yourself coughing and sneezing because of the dust and fumes in the air. Which brain structure controls such vital reflexes as sneezing, coughing, and swallowing?
A) the corpus callosum
B) the cerebellum
C) the medulla
D) the thalamus

183. As you take this test, you do not have to focus on taking your next breath or making your heart beat. This is because the _____ is involved in the control of vital life functions, such as breathing, heart rate, and digestion.
A) medulla
B) pons
C) thalamus
D) parietal lobe

184. The _____ is a network of neurons at the base of the brain that projects signals up to higher brain regions and down to the spinal cord, and regulates attention and sleep.
A) cerebellum
B) hypothalamus
C) reticular formation
D) substantia nigra

185. When President John F. Kennedy was hit by a sniper's bullet in the back of his head, he died almost instantly because the bullet destroyed the part of his brain called the _____, which controls breathing, heartbeat, and other vital body functions.
A) hippocampus
B) medulla
C) amygdala
D) thalamus

186. Which structure helps relay information from higher brain regions to the cerebellum and helps coordinate and integrate movements on each side of the body?
A) the substantia nigra
B) the corpus callosum
C) the amygdala
D) the pons

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187. Your pencil starts to roll off the desk and in a smooth, coordinated fashion you grab it just before it rolls off the edge. Your ability to perform this action MOSTLY involved which of the following brain areas?
A) the cerebellum
B) the hippocampus
C) the amygdala
D) Broca's area

188. After too many drinks at a party, your friend awkwardly stumbles into a table, almost knocking it over. Your friend's coordination for simple actions, such as walking between two tables, is reduced because the alcohol has affected his:
A) medulla.
B) cerebellum.
C) thalamus.
D) somatosensory cortex.

189. As you are walking in a crowded hallway, someone calls your name. Almost instantly, you sense that the person is on your left. Your brain's ability to detect the direction of a sound is initially processed in the:
A) medulla.
B) frontal lobe.
C) midbrain region.
D) occipital lobe.

190. As you play a Star Trek video game, you track all of the Romulan warships as they fly across the screen, attacking your ship, the USS Enterprise. In visually tracking the movements on the screen, the _____ plays an important role.
A) hypothalamus
B) hindbrain
C) midbrain
D) pons

191. The substantia nigra is:
A) located in the midbrain.
B) the brain location that has shown the greatest degree of neurogenesis in studies with rats and primates.
C) the primary communication link between the two hemispheres of the cerebral cortex.
D) the point at which motor signals cross over from one side of the brain to the opposite side of the body.

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192. The substantia nigra:
A) contains dopamine-producing neurons and is involved in motor control.
B) is the region that has shown the greatest degree of neurogenesis in humans.
C) is the primary communication link between the left and right cerebral hemispheres.
D) does not fully develop until late adolescence.

193. Parkinson's disease often involves the degeneration of neurons that produce _____, which are located in a brain area called the _____.
A) serotonin; somatosensory cortex
B) dopamine; substantia nigra
C) acetylcholine; thalamus
D) norepinephrine; pons

194. Which of the following statements is FALSE?
A) The term substantia nigra means "dark substance."
B) The substantia nigra contains almost all of the serotonin-producing neurons in the brain.
C) The symptoms of Parkinson's disease are often associated with the degeneration of dopamine-producing neurons in the substantia nigra.
D) The substantia nigra is located in the midbrain.

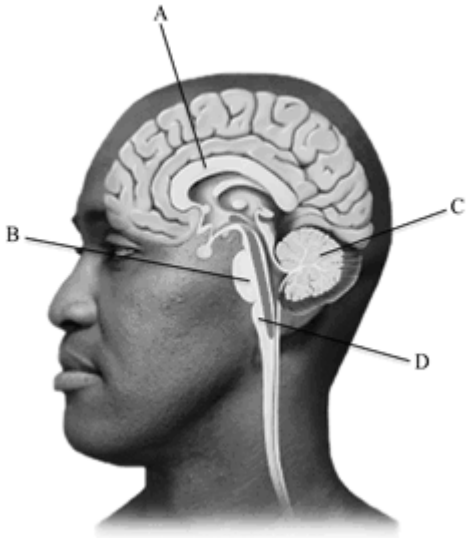
195. Which of the following represents the largest region of the brain?
A) the forebrain
B) the hindbrain
C) the cerebellum
D) the midbrain

196. Comparing the structure of the human brain to that of other animals reveals that:
A) human brain organization bears little or no resemblance to that of lower animals, such as birds and fish.
B) all animals have a cerebellum, but only humans and other primates have a cortex.
C) the human cortex is much more complex than that of lower animals, which makes up for the absence of a cerebellum in the human brain.
D) the basic structure of the human brain is similar to that of many other animals, but a higher proportion of the human brain is devoted to the cortex.

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197. The primary communication link between the left and right cerebral hemispheres is called:
A) the hypothalamus.
B) the hippocampus.
C) Broca's area.
D) the corpus callosum.

198. Which letter points to the structure connecting the two cerebral hemispheres?



A) corpus callosum
B) pons
C) cerebellum
D) medulla

199. The phrase white matter in the brain refers to:
A) myelinated axons.
B) the large spaces on the interior of the brain called ventricles.
C) unmyelinated axons, glial cells, and cell bodies.
D) neurons that manufacture endorphins.

200. White matter is to gray matter as _____ is(are) to _____.
A) cell bodies and glial cells; myelinated axons
B) myelinated axons; neural cell bodies and glial cells
C) dendrites; glial cells and axons
D) midbrain; hindbrain

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201. Which best describes the surface of the cerebral cortex?
    A) smooth, pinkish tissue, well-endowed with blood vessels
    B) a rounded, semicircular mass of white matter
    C) darkly pigmented tissue bisected by a single deep fissure
    D) numerous folds, wrinkles, bulges, ridges, and valleys

202. During the middle of a test, your instructor announces that there's a typographical error on one of the questions. As you listen, the auditory information is being processed in your ____ lobe.
    A) occipital
    B) frontal
    C) temporal
    D) parietal

203. Each cerebral hemisphere can be roughly divided into four lobes. Which lobe processes auditory information?
    A) the frontal lobe
    B) the parietal lobe
    C) the temporal lobe
    D) the occipital lobe

204. The occipital lobe is to _____ as the temporal lobe is to _____.
    A) vision; somatosensory processing
    B) audition; vision
    C) somatosensory processing; audition
    D) vision; audition

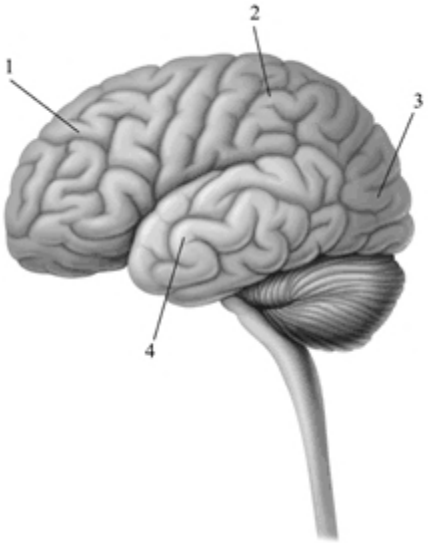
205. Standing at an arrival gate, you scan the faces of the passengers as they walk off the plane as you look for your friend. This visual information is being processed in your _____ lobe.
    A) occipital
    B) parietal
    C) frontal
    D) temporal

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206. As you wait in line at the airport, the guy behind you is standing so close that his briefcase is pushing against your leg. The sensation of the briefcase touching and pushing against you is being processed in your _____ lobe.
A) frontal
B) occipital
C) temporal
D) parietal

207. A gymnast knows where his arms and legs are as he does his tumbling routine because information from his muscles and joints is relayed to his _____ lobe.
A) temporal
B) frontal
C) occipital
D) parietal

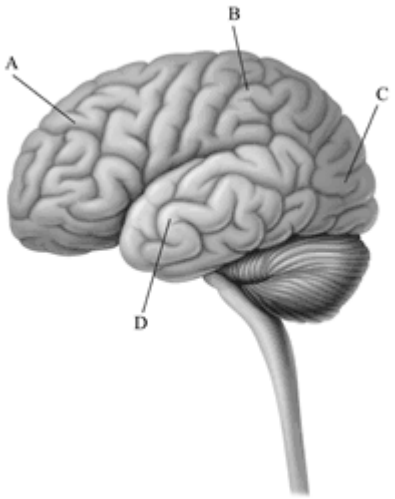
208. This image depicts the left hemisphere of the cerebral cortex. Pick the alternative that correctly labels the structures in the drawing.



A) 1 = parietal lobe, 2 = gray matter, 3 = association areas, 4 = white matter
B) 1 = frontal lobe, 2 = parietal lobe, 3 = occipital lobe, 4 = temporal lobe
C) 1 = frontal lobe, 2 = temporal lobe, 3 = parietal lobe, 4 = occipital lobe
D) 1 = temporal lobe, 2 = midbrain lobe, 3 = occipital lobe, 4 = frontal lobe

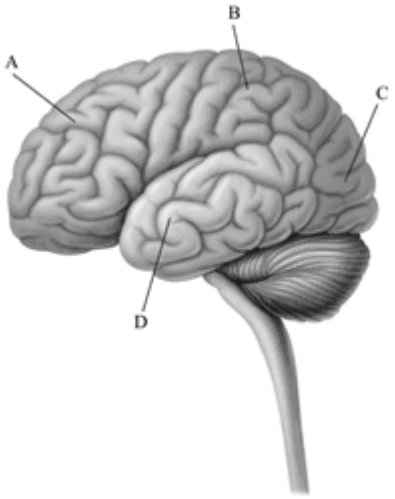
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209. This image depicts the left hemisphere of the cerebral cortex. Which area contains the primary auditory cortex and processes auditory information?



A) frontal lobe
B) parietal lobe
C) occipital lobe
D) temporal lobe

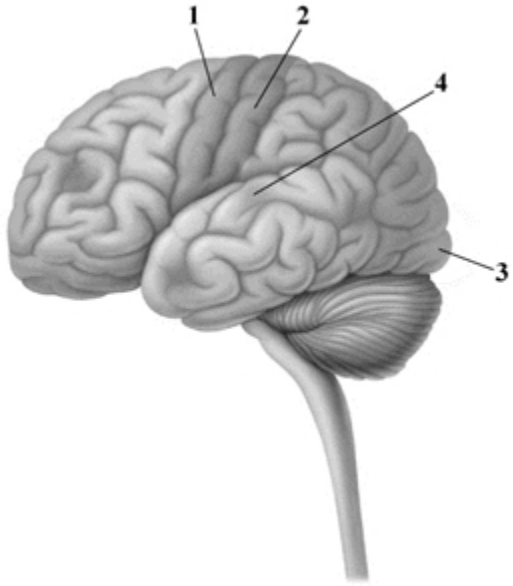
210. This image depicts the left hemisphere of the cerebral cortex. Which area processes information about body sensations and contains the somatosensory cortex?



A) frontal lobe
B) parietal lobe
C) occipital lobe
D) temporal lobe

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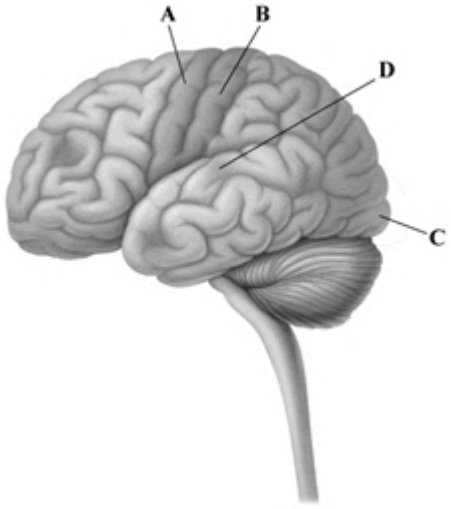
211. This drawing depicts the left hemisphere of the cerebral cortex. Pick the alternative that correctly labels the drawing.



A) 1 = parietal lobe, 2 = temporal lobe, 3 = occipital lobe, 4 = midbrain
B) 1 = primary motor cortex, 2 = somatosensory cortex, 3 = primary visual cortex, 4 = primary auditory cortex
C) 1 = gray matter, 2 = white matter, 3 = cerebellum, 4 = midbrain
D) 1 = corpus callosum, 2 = lateral fissure, 3 = occipital lobe, 4 = Broca's area

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212. This drawing depicts the left hemisphere of the cerebral cortex. Which letter points to the area where the signals for voluntary muscle movements are initiated?



A) frontal lobe and primary motor cortex
B) somatosensory cortex
C) primary visual cortex
D) primary auditory cortex

213. Which of the following statements is FALSE?
A) Sensory and motor information are processed and integrated in association areas on the cerebral cortex.
B) Body sensations such as touch, temperature, and pressure are processed in the somatosensory cortex.
C) The temporal lobe contains the primary auditory cortex, which processes auditory information.
D) Each part of the body has the same degree of representation on the primary motor cortex.

214. Your nephew's eyes suddenly light up and he reaches out, executes a double-jump of your checker pieces, and then smiles at you triumphantly. The brain signals for these voluntary actions originated in the _____ of your nephew's brain.
A) somatosensory cortex
B) primary motor cortex
C) temporal lobe
D) hippocampus

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215. The signals for voluntary muscle movements originate in a band of tissue called the _____, which is located on the _____ lobe.
A) primary motor cortex; parietal
B) somatosensory cortex; parietal
C) primary motor cortex; frontal
D) association area; occipital

216. Which of the following body areas has (have) the greatest degree of representation on the primary motor cortex and the somatosensory cortex?
A) the knee
B) the face
C) the arm
D) the feet

217. How is each part of the body represented on the somatosensory cortex?
A) in proportion to each body part's potential for movement
B) in proportion to the degree of neurogenesis that has occurred in each segment of the region
C) in proportion to the size of each body part
D) in proportion to each body part's sensitivity to physical ensations

218. Which parts of the body have the greatest representation on the primary motor cortex?
A) hands and facial muscles
B) legs and arms muscles
C) head and neck muscles
D) chest and back muscles

219. A large bulk of the cerebral cortex is not devoted to any particular sensory or motor function. Rather, these areas, known as _____, are generally thought to be involved in processing and integrating sensory and motor information.
A) secondary cortex areas
B) association areas
C) the limbic system
D) Broca's and Wernicke's areas

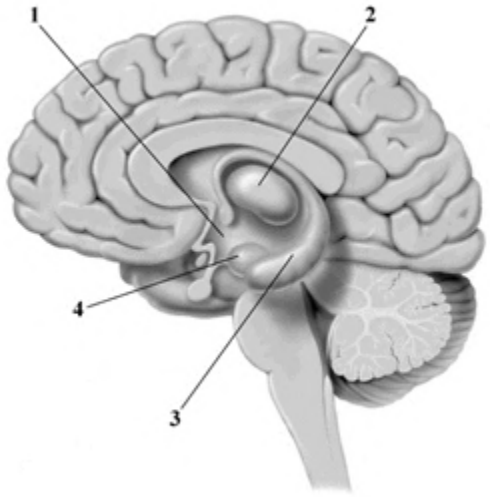
220. Which of the following brain structures is NOT a key component of the limbic system?
A) the reticular formation
B) the amygdala
C) the hippocampus
D) the hypothalamus

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221. The hippocampus plays a key role in:
    A) regulating sleep and wakefulness.
    B) survival behaviors, including eating and drinking.
    C) forming new memories.
    D) emotional responses, including fear, anger, and disgust.

222. The limbic system refers to the:
    A) hypothalamus, pituitary gland, and adrenal glands.
    B) hippocampus, thalamus, amygdala, and hypothalamus.
    C) thalamus, cerebellum, pons, medulla, and hypothalamus.
    D) parietal, occipital, frontal, and temporal lobes.

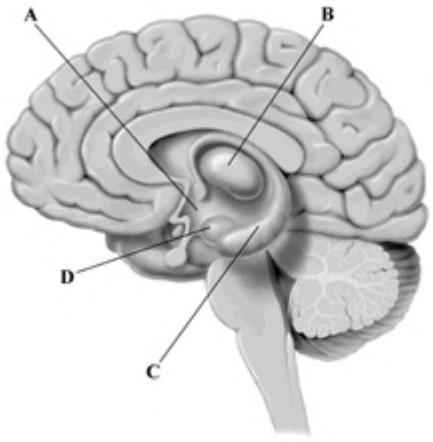
223. This cross-sectional drawing of the human brain depicts four structures that are key components of the limbic system. Pick the alternative that correctly labels the structures in the drawing.



    A) 1 = hypothalamus, 2 = thalamus, 3 = hippocampus, 4 = amygdala
    B) 1 = pituitary gland, 2 = corpus callosum, 3 = reticular formation, 4 = hypothalamus
    C) 1 = thalamus, 2 = hypothalamus, 3 = amygdala, 4 = hippocampus
    D) 1 = suprachiasmatic nucleus, 2 = association area, 3 = cerebellum, 4 = hippocampus

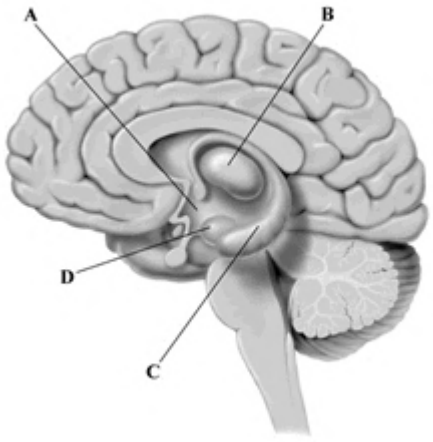
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224. This cross-sectional drawing of the human brain depicts four structures that are key components of the limbic system. Which brain structure plays a critical role in forming new memories?



A) hypothalamus
B) thalamus
C) hippocampus
D) amygdala

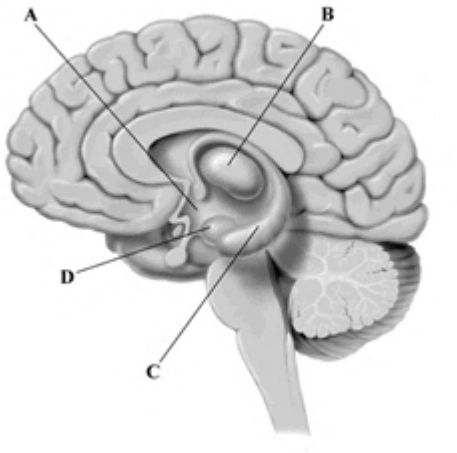
225. This cross-sectional drawing of the human brain depicts four structures that are key components of the limbic system. Which brain structure processes and integrates information from all the senses, except smell?



A) hypothalamus
B) thalamus
C) hippocampus
D) amygdala

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226. This cross-sectional drawing of the human brain depicts four structures that are key components of the limbic system. Which brain structure regulates survival behaviors, such as eating, drinking, fear, aggression, and sleep–wake cycles?



A) hypothalamus
B) thalamus
C) hippocampus
D) amygdala

227. After an automobile accident, Randy experienced a series of severe seizures. After the seizures stopped, Randy's ability to form new memories was greatly impaired. Which brain structure was most likely damaged by the severe seizures?
A) the hypothalamus
B) the hippocampus
C) the somatosensory cortex
D) the thalamus

228. According to your text, there is good evidence to show that neurogenesis takes place in which region(s) of the adult human brain?
A) the amygdala
B) the thalamus and the hypothalamus
C) throughout the limbic system
D) the hippocampus

229. Almost all of the sensory and motor information going to and from the cerebral cortex is processed through the:
A) thalamus.
B) hypothalamus.
C) hippocampus.
D) pituitary gland.

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230. Recent evidence suggests that _____ is more than just a sensory relay station and plays a key role in regulating levels of awareness.
A) the pituitary gland
B) the thalamus
C) Broca's area
D) the primary motor cortex

231. You've been studying biology in the library for the last couple of hours when you realize that you're getting really hungry and thirsty. Which brain structure played a key role in triggering feelings of hunger and thirst?
A) the pituitary gland
B) the corpus callosum
C) the hypothalamus
D) the hippocampus

232. Which brain structure regulates the sympathetic and parasympathetic branches of the autonomic nervous system?
A) the amygdala
B) the hippocampus
C) the thalamus
D) the hypothalamus

233. Daily rhythms of sleep and wakefulness are regulated by the _____, which is found in the _____.
A) suprachiasmatic nucleus (SCN); hypothalamus
B) reticular formation; frontal lobe
C) hippocampus; hypothalamus
D) cerebellum; midbrain

234. Which two limbic system structures are especially associated with forming new memories?
A) the hypothalamus and the substantia nigra
B) the thalamus and the hypothalamus
C) the hippocampus and amygdala
D) the thalamus and cerebellum

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235. The hypothalamus exerts control over the endocrine system by directly triggering activity in the:
A) amygdala.
B) thyroid.
C) pituitary gland.
D) hippocampus.

236. Which brain structure exerts considerable influence over the secretion of hormones throughout the body?
A) the hypothalamus
B) the amygdala
C) the hippocampus
D) the thalamus

237. In animals, electrical stimulation of the amygdala produces:
A) an almost instantaneous onset of sleep.
B) awkward, clumsy behavior.
C) grooming or mating behavior.
D) behaviors associated with fear.

238. Of the following brain structures, which is associated with the emotional responses of fear, disgust, and anger?
A) the hypothalamus
B) the amygdala
C) the thalamus
D) Broca's area

239. According to the Critical Thinking box, "'His' and 'Her' Brains?" which of the following is FALSE?
A) Men's brains tend to be larger than women's brains.
B) In general, men's brains are more symmetrical than women's brains.
C) Women have a higher proportion of gray matter to white matter in their brains than men.
D) Women display greater cortical complexity than men.

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240. According to the Critical Thinking box in the text, "'His' and 'Her' Brains?":
    A) neuroscientists have found no structural differences between male and female brains.
    B) physiological gender differences are innate, biological, permanent, and hard-wired in the brain.
    C) not all structural differences found in male and female brains lead to differences in measurable behavior or abilities.
    D) research findings on differences in male and female brains conclusively support the belief that men and women think and reason differently.

241. According to the Critical Thinking box in the text, "'His' and 'Her' Brains," which of the following is TRUE?
    A) Women's brains tend to be larger than men's brains.
    B) Women and men have different proportions of gray to white matter in their brains.
    C) In general, the male brain is more symmetrical and functions are less lateralized than in the female brain.
    D) Female brains possess a much higher proportion of white matter than male brains meaning they can process information much faster.

242. Cortical localization refers to the idea that:
    A) specific areas of the cerebral cortex are associated with specific behaviors or psychological processes.
    B) specific behaviors or psychological processes can shift from damaged brain areas to undamaged areas.
    C) brain organization is fundamentally different for left-handed versus right-handed people.
    D) specific psychological or cognitive functions are processed primarily in one side of the brain.

243. Phrenology helped introduce the idea of brain _____, while the split-brain research demonstrated the principle of brain _____.
    A) localization; lateralization
    B) lateralization; localization
    C) specialization; plasticity
    D) plasticity; specialization

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244. Broca's area is located on the _____lobe, whereas Wernicke's area is located on the ____ lobe.
A) right frontal; left frontal
B) left temporal; right temporal
C) left frontal; left temporal
D) right temporal ; right frontal

245. A German neurologist named _____ identified an area on the left temporal lobe that, when damaged, disrupted the ability to understand written or spoken language.
A) Paul Broca
B) Karl Wernicke
C) Roger Sperry
D) Franz Gall

246. The discoveries of Pierre Paul Broca and Karl Wernicke:
A) provided compelling evidence that language and speech functions are lateralized on the right hemisphere.
B) discredited the idea of cortical localization.
C) provided compelling evidence that language and speech functions are lateralized on the left hemisphere.
D) were later discredited by the work of psychologist Roger Sperry and his colleagues.

247. The idea that specific psychological or cognitive functions are processed primarily on one side of the brain is called:
A) cortical localization.
B) lateralization of function.
C) functional plasticity.
D) structural plasticity.

248. When brain damage causes the loss of the ability to speak, write, or understand spoken or written language, it is a condition called:
A) aphasia.
B) Parkinson's disease
C) epilepsy.
D) Alzheimer's disease.

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249. Damage to Wernicke's area in the brain:
    A) produces disruptions in the sense of balance as well as numbness in the arms and legs.
    B) produces difficulty speaking but does not disrupt the ability to comprehend verbal or written words.
    C) disrupts or destroys the ability to form new memories.
    D) produces difficulty in comprehending written or spoken communication.

250. Broca's aphasia is often referred to as _____ aphasia.
    A) right-hemisphere
    B) expressive
    C) Wernicke's
    D) split-brain

251. Carlos had a stroke and although he has recovered many of his motor skills, he still has considerable difficulty with language. It is almost impossible for Carlos to produce speech, although he comprehends both written and spoken language quite well. Carlos is demonstrating characteristics of _____aphasia.
    A) left-hemisphere
    B) Broca's
    C) Wernicke's
    D) right-hemisphere

252. The chapter prologue described a young university professor named Asha who suffered a stroke. Following her stroke, Asha's ability to speak was not impaired, but she was unable to read and often had difficulty understanding what was said to her. Asha showed many of the symptoms that characterize:
    A) right-hemisphere damage.
    B) Broca's aphasia.
    C) Parkinson's disease.
    D) Wernicke's aphasia.

253. Why was the split-brain operation first performed?
    A) to study the specialized abilities of the left and right hemispheres
    B) to help control recurring epileptic seizures
    C) to identify the location of motor centers in the brain
    D) to treat people suffering from severe forms of aphasia

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254. What was the logic behind the first split-brain operations that were tried experimentally with humans?
    A) By removing the precise brain location where epileptic seizures originated, the seizures should stop.
    B) By selectively removing portions of the left hemisphere, language functions should shift to the right hemisphere.
    C) By cutting the corpus callosum, seizure activity should be contained in just one hemisphere of the brain.
    D) By cutting the corpus callosum, the brain would be forced to use the left and right hemispheres for different functions.

255. Following her stroke, Fernando's grandmother could understand what she read or what was being said to her. However, she had great difficulty speaking. Based on these observations, Fernando suspected that his grandmother's stroke had produced damage in:
    A) Wernicke's area.
    B) Broca's area.
    C) the corpus callosum.
    D) the hippocampus.

256. Psychologist Roger Sperry is best known for his:
    A) discovery of neurogenesis in the brains of rats.
    B) case studies of stroke patients with language difficulties.
    C) studies of rats that were raised in "impoverished" versus "enriched" environments.
    D) studies of split-brain patients.

257. Tracy is a split-brain patient seated in front of a screen. As she focuses on the middle of the screen, the image of a fork is briefly flashed on the RIGHT side of the screen. Tracy will:
    A) be able to verbally name the object.
    B) be able to use her left hand to reach under the screen and pick up the correct object.
    C) verbally deny that any image appeared on the screen.
    D) probably have an epileptic seizure.

258. Based on research with split-brain patients, we know that the _____ hemisphere is specialized for _____.
    A) left; emotional and nonverbal aspects of communication
    B) right; visual perception tasks
    C) right; language abilities
    D) left; artistic and musical appreciation

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259. Your _____ contributes to your ability to appreciate music.
A) hippocampus
B) right hemisphere
C) prefrontal association cortex
D) left hemisphere

260. In reading these test questions, you are primarily using your _____ to understand what you are reading.
A) left hemisphere
B) right hemisphere
C) amygdala
D) medulla

261. The chapter Prologue described the story of a young university professor named Asha who suffered a stroke. Even though some of Asha's language abilities were disrupted by the stroke, she was still able to appreciate music because her _____ was not damaged.
A) corpus callosum
B) left hemisphere
C) right hemisphere
D) amygdala

262. In the college cafeteria, your friend Larry, who is an art major, loudly proclaims that because he is an artist, he is right-brained and it's no wonder he's having trouble with his college algebra class. Because you have read this chapter, you are able to tell him that:
A) with special training, he should be able to better educate his left brain, so that he will at least pass algebra even if he'll never be very good at it.
B) he should drop algebra and take geometry, which takes a more right-brain approach to mathematics.
C) his problems with algebra cannot be blamed on either his right or left hemispheres; it is a myth that people are either "right-brained" or "left-brained."
D) given the right degree of environmental stimulation, he should be able to increase his left-hemisphere abilities, but doing so will undoubtedly lessen his artistic creativity.

263. About 75 percent of left-handed people are:
A) left-hemisphere-dominant for language.
B) right-hemisphere-dominant for language.
C) bilateral, using both hemispheres for language functions.
D) sometimes left-hemisphere-dominant, sometimes right-hemisphere-dominant, depending upon the nature of the speech or language task.

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264. Which one of the following statements is TRUE?
    A) Despite the fact that some people write with their left hand, all humans show left-hemisphere-dominance for language functions.
    B) The vast majority of people are strongly right-handed, using their right hands for virtually all tasks requiring dexterity.
    C) The fact that it is very easy to teach infants and young children to be left-handed strongly suggests that handedness is determined by environmental conditions, not genetics.
    D) The percentage of the population that is strongly left-handed is approximately 15 to 20 percent.

265. Your roommate insists that the right hemisphere of the brain primarily contributes to creativity and intuition. Is your roommate correct?
    A) No. There is no evidence that the right hemisphere is any more intuitive or creative than the left hemisphere.
    B) Yes. Brain scans show that highly creative people have greater activation in the right hemisphere of the brain.
    C) Yes and no. The right hemisphere of the brain is responsible for creativity, while the left hemisphere contributes to intuition.
    D) Yes and no. The right hemisphere of the brain is responsible for intuition, while the left hemisphere contributes to creativity.

266. Which of the following results have NOT been reported in rats that have been raised in an enriched environment as compared to rats raised in an impoverished environment?
    A) increased number of synapses and synaptic connections
    B) thicker myelin sheaths and an increased number of axons
    C) increased length of dendrites and more dendritic branches
    D) increase in the number of glial cells

267. According to the Psych for Your Life feature in Chapter 2, living in an enriched environment has been shown to:
    A) enhance neurogenesis, increasing the number and survival rate of new neurons.
    B) increase the rate at which axons and dendritic spines are pruned in the cerebellum and midbrain regions.
    C) increase the rate at which unused neurons are pruned.
    D) increase the speed of neurotransmission.

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268. Research has shown that neurogenesis in adult rats can be enhanced by:
    A) taking drugs that increase the production of dopamine.
    B) living in an enriched environment.
    C) constant exposure to bright lights.
    D) taking drugs that increase the production of endorphins.

269. Compared with young rats that have been raised in an "impoverished" environment, young rats that have been raised in an "enriched" environment have:
    A) more dendritic branches and more synaptic connections in the cerebral cortex.
    B) a much stronger tendency to favor their left paws.
    C) an enlarged medulla and reticular formation.
    D) about half as many glial cells but almost double the number of neurons in their brain.

270. Based on studies with rats, it is clear that the exposure to environmental enrichment:
    A) has no detectable effect on the brain.
    B) can have an impact on brain development during early life but not in later life.
    C) enhances right-hemisphere abilities but not left-hemisphere abilities.
    D) produces significant brain changes regardless of the age of the rats.

271. According to the Psych for Your Life feature in Chapter 2, in general, the greater the level of aerobic fitness the:
    A) greater the increase of blood flow to the hippocampus.
    B) worse people's memories became.
    C) lower the level of endorphins in the brain.
    D) greater the likelihood of developing aphasia.

272. The implication of Pereira's study on exercise and neurogenesis, discussed in the Psych for Your Life feature in Chapter 2, was that:
    A) experience has little or no effect on brain functions or structures.
    B) exercising regularly retarded the release of endorphins in the brain.
    C) neurogenesis was directly correlated with addiction to exercise.
    D) exercise promotes the growth of new neurons in the human brain just as it does in other mammals.

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Answer Key

1. D
2. B
3. A
4. B
5. B
6. D
7. C
8. A
9. D
10. C
11. A
12. A
13. B
14. A
15. A
16. A
17. A
18. B
19. B
20. B
21. D
22. C
23. A
24. B
25. A
26. A
27. A
28. A
29. B
30. C
31. D
32. B
33. B
34. C
35. A
36. B
37. C
38. D
39. B
40. A
41. D
42. C
43. B
44. C

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45. A
46. D
47. C
48. A
49. C
50. A
51. D
52. B
53. A
54. D
55. B
56. D
57. D
58. A
59. A
60. C
61. B
62. A
63. C
64. C
65. A
66. B
67. D
68. B
69. B
70. B
71. B
72. D
73. B
74. D
75. C
76. A
77. C
78. C
79. B
80. A
81. C
82. B
83. D
84. C
85. D
86. A
87. B
88. C
89. B
90. C

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91. D
92. A
93. B
94. B
95. C
96. D
97. D
98. C
99. B
100. C
101. C
102. C
103. A
104. A
105. D
106. D
107. D
108. A
109. C
110. A
111. B
112. A
113. B
114. A
115. C
116. D
117. D
118. B
119. A
120. C
121. B
122. D
123. A
124. D
125. A
126. C
127. A
128. C
129. A
130. B
131. B
132. A
133. B
134. C
135. B
136. B

Discovering Psychology 7th edition Hockenbury Test Bank

137. B
138. C
139. A
140. D
141. B
142. C
143. B
144. D
145. A
146. B
147. D
148. C
149. A
150. B
151. D
152. D
153. C
154. A
155. C
156. C
157. B
158. C
159. C
160. C
161. D
162. B
163. B
164. A
165. B
166. C
167. A
168. C
169. A
170. B
171. C
172. B
173. A
174. D
175. C
176. D
177. B
178. D
179. C
180. A
181. B
182. C

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183. A
184. C
185. B
186. D
187. A
188. B
189. C
190. C
191. A
192. A
193. B
194. B
195. A
196. D
197. D
198. A
199. A
200. B
201. D
202. C
203. C
204. D
205. A
206. D
207. D
208. B
209. D
210. B
211. B
212. A
213. D
214. B
215. C
216. B
217. D
218. A
219. B
220. A
221. C
222. B
223. A
224. C
225. B
226. A
227. B
228. D

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229. A
230. B
231. C
232. D
233. A
234. C
235. C
236. A
237. D
238. B
239. B
240. C
241. B
242. A
243. A
244. C
245. B
246. C
247. B
248. A
249. D
250. B
251. B
252. D
253. B
254. C
255. B
256. D
257. A
258. B
259. B
260. A
261. C
262. C
263. A
264. B
265. A
266. B
267. A
268. B
269. A
270. D
271. A
272. D

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1. Biological psychology is the scientific study of the biological bases of behavior and mental processes.
   A) True
   B) False

2. The field of neuroscience focuses primarily on the effects of environmental input on human behavior.
   A) True
   B) False

3. The human brain contains approximately 100 billion neurons and about ten times as many glial cells.
   A) True
   B) False

4. Interneurons communicate information from one neuron to the next.
   A) True
   B) False

5. Sensory neurons communicate information to muscles to help muscles better respond to environmental events.
   A) True
   B) False

6. The neuron's genetic material (DNA) is found in the nucleus of the neuron's cell body.
   A) True
   B) False

7. Dendrites receive information from other neurons.
   A) True
   B) False

8. Neurons outnumber glial cells by about 10 to 1.
   A) True
   B) False

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9. Glial cells provide structural support and nutrition for neurons and remove waste products.
   A) True
   B) False

10. Glial cells are the most abundant cells in the human brain.
   A) True
   B) False

11. Microglia are involved in brain development and the communication of information among neurons.
   A) True
   B) False

12. Glial cells are the most abundant cells in the human brain, provide connections between neurons and blood vessels, and are involved in brain development and the communication of information among neurons.
   A) True
   B) False

13. Oligodendrocytes and Schwann cells form the myelin sheath, a fatty covering that is wrapped around the axons of some neurons.
   A) True
   B) False

14. Schwann cells remove waste products from the nervous system, including dead and damaged neurons.
   A) True
   B) False

15. Oligodendrocytes provide connections between neurons and blood vessels.
   A) True
   B) False

16. The myelin sheath is a white fatty covering that surrounds the axons of some neurons.
   A) True
   B) False

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17. The myelin sheath covering an axon insulates that axon from other axons and increases its communication speed.
    A) True
    B) False

18. The action potential is the brief electrical impulse that is transmitted along the axon.
    A) True
    B) False

19. When a neuron is in the resting state, it is polarized so that the axon's interior is more positively charged than the exterior fluid surrounding the axon.
    A) True
    B) False

20. An action potential is produced by the movement of ions across the axon membrane.
    A) True
    B) False

21. When a neuron depolarizes and begins an action potential, sodium ions move into the axon and then potassium ions move out of the axon.
    A) True
    B) False

22. The all-or-none law refers to a neuron's ability to either release all or none of its neurotransmitter when an action potential occurs in its axon.
    A) True
    B) False

23. During the refractory period, the neuron is unable to fire.
    A) True
    B) False

24. About 12 to 15 seconds elapse during the entire sequence of a neuron's activation, generation of action potential, and reestablishment of the ability to fire again.
    A) True
    B) False

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25. The action potential is slower in myelinated neurons, because it has to travel the entire length of the axon rather than being able to jump from one node of Ranvier to the next.
    A) True
    B) False

26. The synaptic vesicles are tiny pouches that hold the special chemical messengers manufactured by the neuron called neurotransmitters.
    A) True
    B) False

27. Synaptic vesicles contain neurotransmitters.
    A) True
    B) False

28. During the process of reuptake, glial cells absorb unused neurotransmitters and then transfer the neurotransmitters to the appropriate neuron.
    A) True
    B) False

29. Each neuron produces only one type of neurotransmitter.
    A) True
    B) False

30. The receiving, or postsynaptic, neuron can have many differently shaped receptor sites on its dendrites, allowing it to receive more than one type of neurotransmitter.
    A) True
    B) False

31. An excitatory message communicated to a postsynaptic neuron increases the likelihood that the postsynaptic neuron will generate an action potential.
    A) True
    B) False

32. The neurotransmitter called acetylcholine plays a key role in sleep, moods, and emotional states, including the symptoms of major depressive disorder.
    A) True
    B) False

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33. Acetylcholine is found in all motor neurons.
    A) True
    B) False

34. Diminished brain levels of dopamine can produce symptoms of Parkinson's disease, while excess brain levels of dopamine can produce symptoms of schizophrenia.
    A) True
    B) False

35. Dopamine is the neurotransmitter that has been found to be most depleted in Alzheimer's patients.
    A) True
    B) False

36. Alcohol makes people feel relaxed by enhancing glutamate release.
    A) True
    B) False

37. Endorphins have pain-reducing effects.
    A) True
    B) False

38. Acupuncture seems to reduce pain by reducing the availability of serotonin and dopamine in the brain.
    A) True
    B) False

39. One of the key ways that drugs affect synaptic transmission is by changing an excitatory neurotransmitter to an inhibitory neurotransmitter and vice versa.
    A) True
    B) False

40. "Runner's high" is the rush of euphoria that many people experience after sustained aerobic exercise.
    A) True
    B) False

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41. Research has shown that the greater the subjective feelings of euphoria experienced by runners, the higher the brain level of endorphin activity.
    A) True
    B) False

42. Black widow spider venom causes the release of dopamine, resulting in muscle spasms.
    A) True
    B) False

43. Prozac and many other antidepressant medications increase the availability of serotonin in certain brain areas.
    A) True
    B) False

44. An agonist is a drug or other chemical that binds to a receptor site and triggers a response in the cell.
    A) True
    B) False

45. An agonist is a neurotransmitter that activates a receptor site and inhibits or prevents a response in the receiving cell.
    A) True
    B) False

46. Nicotine binds to acetylcholine receptor sites, stimulating skeletal muscles and causing the heart to beat more rapidly. Thus, nicotine is an agonist.
    A) True
    B) False

47. An antagonist is a neurotransmitter that activates a receptor site and triggers a response in the cell.
    A) True
    B) False

48. One way in which drugs can prolong the effects of a neurotransmitter is through blocking the reuptake of the neurotransmitter by the sending neuron.
    A) True
    B) False

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49. Because the drug naloxone is chemically dissimilar to endorphins and opiates, it prolongs and intensifies their effects.
    A) True
    B) False

50. An antagonist is a drug or other chemical that blocks a receptor site and inhibits or prevents a response in the receiving cell.
    A) True
    B) False

51. An antagonist is a drug or other chemical that binds to a receptor site and triggers a response in the cell.
    A) True
    B) False

52. The drug curare blocks acetylcholine receptor sites, causing virtually instantaneous paralysis. Thus, curare is an agonist.
    A) True
    B) False

53. The drug naloxone acts as an antagonist at opioid receptor sites and can reverse the effects of both endorphins and opiates.
    A) True
    B) False

54. In the central nervous system, nerves are the most important transmitter of messages.
    A) True
    B) False

55. Throughout the entire body, the human nervous system contains an estimated 1 trillion neurons.
    A) True
    B) False

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56. The central nervous system and the peripheral nervous system act independently of each other.
    A) True
    B) False

57. There are four hollow cavities in the brain, called ventricles, which are filled with cerebrospinal fluid and whose inner surfaces are lined with neural stem cells.
    A) True
    B) False

58. The most common type of traumatic brain injury is a concussion.
    A) True
    B) False

59. Chronic traumatic encephalopathy can be diagnosed before noticeable symptoms are present.
    A) True
    B) False

60. Some simple forms of behavior, called spinal reflexes, occur without any involvement of the brain.
    A) True
    B) False

61. The autonomic nervous system regulates spinal reflexes.
    A) True
    B) False

62. The two subdivisions of the peripheral nervous system are the somatic nervous system and the autonomic nervous system.
    A) True
    B) False

63. The somatic nervous system regulates involuntary functions, including heartbeat, blood pressure, breathing, and digestion.
    A) True
    B) False

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64. As your body's emergency system, the sympathetic nervous system rapidly triggers the fight-or-flight response when a threat or danger is perceived.
    A) True
    B) False

65. The sympathetic nervous system conserves and maintains your body's energy resources, whereas the parasympathetic nervous system activates your body and prepares the body for action.
    A) True
    B) False

66. The fight-or-flight response is triggered by the activation of the sympathetic nervous system.
    A) True
    B) False

67. Endocrine glands communication from one part of the body to another by secreting messenger chemicals called pepsin.
    A) True
    B) False

68. Your metabolism, growth rate, digestion, and blood pressure are regulated by hormones.
    A) True
    B) False

69. Hormones can influence the nervous system by promoting or inhibiting the generation of nerve impulses.
    A) True
    B) False

70. Melatonin is a hormone secreted by the thyroid gland that plays an important role in the "let down" of milk in nursing mothers.
    A) True
    B) False

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71. Pituitary hormones regulate the production of other hormones by many of the glands in the endocrine system.
    A) True
    B) False

72. The hypothalamus is largely controlled by the pituitary gland.
    A) True
    B) False

73. The adrenal medulla, which secretes epinephrine and norepinephrine, plays a key role in helping to activate the body during the fight-or-flight response.
    A) True
    B) False

74. The adrenal cortex plays a key role in the fight-or-flight response through its production of epinephrine and norepinephrine.
    A) True
    B) False

75. In males, the gonads are the testes, which produce hormones called androgens, the most important of which is testosterone.
    A) True
    B) False

76. Gonads are found only in males.
    A) True
    B) False

77. Although the basic premise of phrenology was disproved, it helped trigger scientific interest in the idea of cortical localization.
    A) True
    B) False

78. The psychograph machine provides detailed images of the brain's structures.
    A) True
    B) False

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79. The notion that different psychological and mental functions are located or localized in different areas of the brain is called localization of function or cortical localization.
    A) True
    B) False

80. Phrenology, which was a popular pseudoscience in the 1800s, has since been refuted by modern brain research, including research with brain-imaging techniques.
    A) True
    B) False

81. Although Franz Gall and the phrenologists were wrong about the significance of bumps on the skull, they were correct about the idea that different psychological functions are localized in different brain areas.
    A) True
    B) False

82. The brain's ability to change function and structure is referred to as neuroplasticity.
    A) True
    B) False

83. The brain's ability to change function and structure is called cortical localization.
    A) True
    B) False

84. The term functional plasticity refers to the brain's capacity to shift functions from one area to another.
    A) True
    B) False

85. Functional plasticity refers to the notion that different brain functions are located or localized in different areas of the brain.
    A) True
    B) False

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86. Current research shows that structural plasticity is limited to regions in the hindbrain and midbrain; there is no evidence supporting structural plasticity in forebrain structures, including the cerebral cortex.
    A) True
    B) False

87. Humans and nonhuman primates are born with all the brain neurons they will ever have, and there is no evidence that new neurons grow and develop after birth.
    A) True
    B) False

88. Research with primates has shown that some regions of the brain have the capacity to develop new neurons throughout the lifespan.
    A) True
    B) False

89. Contemporary neuroscientists have found newly generated neurons in the hippocampus of the adult human brain.
    A) True
    B) False

90. The Human Connectome Project's goal is to map the millions of miles of neural connections among the 100 billion neurons in the human brain.
    A) True
    B) False

91. The Human Connectome Project's goal is to sequence the human genome.
    A) True
    B) False

92. Launched in 2009 by the National Institutes of Health, the Neural Mapping Project aims to combine brain-imaging data from hundreds of participants into a three-dimensional map of the brain's information highways.
    A) True
    B) False

Discovering Psychology 7th edition Hockenbury Test Bank

93. Launched in 2009 by the National Institutes of Health, the Human Connectome project aims to sequence the human genome.
    A) True
    B) False

94. A new brain-scanning technique called diffusion spectrum imaging allows neuroscientists to produce three-dimensional images of the neural pathways that connect one part of the brain to another.
    A) True
    B) False

95. Diffusion spectrum imaging can produce three-dimensional images of the neural pathways that connect one part of the brain to another.
    A) True
    B) False

96. Diffusion spectrum imaging tracks the movement of water molecules in brain tissue along the axons.
    A) True
    B) False

97. Diffusion spectrum imaging can produce three-dimensional images of the neural pathways that connect one part of the brain to another. These pathways, sometimes called tracts, are made up of cell bodies of neurons.
    A) True
    B) False

98. German neuroscientists used expert, professional jugglers as participants in a study to determine whether the jugglers' superior manual dexterity and sense of balance were the cause or the result of structural brain differences.
    A) True
    B) False

99. According to one research study that involved participants who learned how to juggle, learning a new motor skill produces physical changes in specific brain structures related to the skill.
    A) True
    B) False

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100. According to one research study investigating the effects of learning a new skill on the brain's physical structure, novice jugglers showed evidence of brain changes within just seven days after learning to juggle.
A) True
B) False

101. The structures of the hindbrain and the midbrain are together referred to as the brainstem.
A) True
B) False

102. Because the human brain is characterized by contralateral organization, the left side of the brain controls movement on the right side of the body and vice versa.
A) True
B) False

103. The cerebellum is solely responsible for the control of vital life functions, such as breathing, heart rate, swallowing, and coughing.
A) True
B) False

104. The medulla, the pons, and the cerebellum make up the midbrain.
A) True
B) False

105. The pons controls a number of vital reflexes, including swallowing, coughing, and sneezing.
A) True
B) False

106. A midbrain area called the substantia nigra contains a large concentration of dopamine-producing neurons and is involved in motor control.
A) True
B) False

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107. The forebrain represents about 50 percent of the brain, and the midbrain and hindbrain represent the other 50 percent.
A) True
B) False

108. The corpus callosum is an important midbrain structure that contains many dopamine-producing neurons.
A) True
B) False

109. The brains of fish, birds, amphibians, and humans share many common brain structures, although they differ in their degree of complexity.
A) True
B) False

110. The structural organization of the human brain is unique and different from all other animal species, including primates.
A) True
B) False

111. The temporal lobe contains the primary auditory cortex, which receives auditory information.
A) True
B) False

112. The parietal lobe is involved in planning, initiating, and executing voluntary movements.
A) True
B) False

113. The hands and the face have the greatest degree of representation on both the somatosensory cortex and the primary motor cortex.
A) True
B) False

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114. Each hemisphere of the cerebral cortex can be divided into the occipital, frontal, parietal, and temporal lobes.
    A) True
    B) False

115. The signals for voluntary muscle movements originate in the somatosensory cortex on the frontal lobe.
    A) True
    B) False

116. The brain structure called the hippocampus represents the main link between the endocrine system and nervous system.
    A) True
    B) False

117. The forebrain structure called the hippocampus plays a critical role in the ability to form new memories.
    A) True
    B) False

118. A key function of the hypothalamus is to process and distribute sensory and motor information going to and from the cerebral cortex.
    A) True
    B) False

119. Key structures of the limbic system include the amygdala, hippocampus, thalamus, and hypothalamus.
    A) True
    B) False

120. The amygdala is an almond-shaped structure at the base of the brain that is attached to and controls the pituitary gland.
    A) True
    B) False

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121. The amygdala is involved in a variety of emotional responses, including fear, anger, and disgust.
    A) True
    B) False

122. According to the Critical Thinking box ""His' and 'Her' Brains?," men's brains tend to be larger than women's brains and are more asymmetrical with functions being more lateralized.
    A) True
    B) False

123. Researchers found that the female hippocampus tends to be larger than the male hippocampus and, according to the Critical Thinking box "'His' and 'Her' Brains?", they concluded that this difference accounted for female superiority on memory tests.
    A) True
    B) False

124. According to the Critical Thinking box "'His' and 'Her' Brains?", there are no functional or structural differences between male and female brains.
    A) True
    B) False

125. According to the Critical Thinking box "'His' and 'Her' Brains?", not all structural differences found in male and female brains lead to differences in measurable behavior or abilities.
    A) True
    B) False

126. Two important language regions in the brain, Broca's area and Wernicke's area, are named after the European scientists who discovered their functions in the mid-1800s.
    A) True
    B) False

127. Speech and language are examples of the principle of lateralization of function.
    A) True
    B) False

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128. For the vast majority of people, Broca's area is located on the right frontal lobe and Wernicke's area is located on the right temporal lobe.
    A) True
    B) False

129. Although people with Wernicke's aphasia can speak easily, they often have trouble understanding written or spoken communication.
    A) True
    B) False

130. People with Broca's aphasia find it difficult or impossible to produce speech.
    A) True
    B) False

131. Pierre Broca and Karl Wernicke helped demonstrate that speech and language functions are lateralized.
    A) True
    B) False

132. Humans are the only species that display a preference for handedness.
    A) True
    B) False

133. Roger Sperry developed the split-brain operation as a cure for epilepsy and aphasia.
    A) True
    B) False

134. Roger Sperry's split-brain research in the twentieth century illustrated the independent functions of the two hemispheres.
    A) True
    B) False

135. A split-brain patient will not be able to verbally identify a picture that is flashed to the left visual field (and therefore processed in the right hemisphere) but will be able to pick up the pictured object with his or her left hand.
    A) True
    B) False

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136. Studies with split-brain patients have demonstrated that the corpus callosum serves no particular purpose in the brain.
A) True
B) False

137. For most people, the left hemisphere is superior at language tasks and the right hemisphere is superior at visual perception tasks.
A) True
B) False

138. Most complex tasks will primarily involve either your left cerebral hemisphere or your right cerebral hemisphere, but not both simultaneously.
A) True
B) False

139. In the normal intact brain, the left and right cerebral hemispheres function in an integrated fashion.
A) True
B) False

140. There is now strong evidence that it is possible to "educate" one side of your brain in isolation from the other side, so with proper training you can become more "right-brained" or more "left-brained."
A) True
B) False

141. Approximately 50 percent of left-handed people process language in their right hemisphere.
A) True
B) False

142. People who are logical, analytical, or detail-oriented, are "left-brained" individuals and rely primarily on the capacities of their left hemisphere to solve complex tasks.
A) True
B) False

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143. Because virtually all left-handed people are right-brain dominant, they are generally more creative and artistic than right-handed people, who are left-brain dominant.
A) True
B) False

144. The central nervous system is highly specialized for information integration.
A) True
B) False

145. Studies with rats have confirmed that exposure to "enriched" environments produces structural changes in the brains of young rats but not in the brains of fully mature or older rats.
A) True
B) False

146. A mentally stimulating, intellectually challenging environment is associated with enhanced cognitive functioning.
A) True
B) False

147. Research has shown that living in an enriched environment can affect the brain, but only in very young mammals.
A) True
B) False

148. In general, the greater the level of aerobic fitness, the greater the increase of blood flow to the hippocampus and the birth of new neurons.
A) True
B) False

149. The implication of Pereira's study on exercise and neurogenesis was that exercise promotes the growth of new neurons in the human brain just as it does in other mammals.
A) True
B) False

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150. Experience has little or no effect on brain functioning or structures.
    A) True
    B) False

151. Better-educated people have more synaptic connections and less severe symptoms of Alzheimer's disease than those who are less educated.
    A) True
    B) False

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Answer Key

1. A
2. B
3. A
4. A
5. B
6. A
7. A
8. B
9. A
10. A
11. B
12. A
13. A
14. B
15. B
16. A
17. A
18. A
19. B
20. A
21. A
22. B
23. A
24. B
25. B
26. A
27. A
28. B
29. B
30. A
31. A
32. B
33. A
34. A
35. B
36. B
37. A
38. B
39. B
40. A
41. A
42. B
43. A
44. A

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45. B
46. A
47. B
48. A
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51. B
52. B
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87. B
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90. A

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91. B
92. B
93. B
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97. B
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100. A
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102. A
103. B
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116. B
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120. B
121. A
122. A
123. B
124. B
125. A
126. A
127. A
128. B
129. A
130. A
131. A
132. B
133. A
134. A
135. A
136. B

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137. A
138. B
139. A
140. B
141. B
142. B
143. B
144. A
145. B
146. A
147. B
148. A
149. A
150. B
151. A

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1. _____ is the branch of science that is concerned with the study of the nervous system, especially the brain.
   A) Plasticity
   B) Neuroscience
   C) Clinical psychiatry
   D) Developmental psychology

2. How many neurons are there in the human brain?
   A) 50 million
   B) 50 billion
   C) 10 billion
   D) 100 billion

3. Messages from other neurons or specialized cells and sensory receptors are typically:
   A) collected by the synaptic vesicles.
   B) relayed by glial cells to the correct node of Ranvier.
   C) received by the dendrites.
   D) received by the axon terminals.

4. The resting potential is:
   A) the length of time that a neuron is incapable of activating after an action potential.
   B) the term used to describe how the sympathetic nervous system reduces arousal and conserves energy.
   C) a state in which a neuron has a negative electrical charge of about –70 millivolts.
   D) a state in which a neuron has a positive electrical charge of +70 millivolts.

5. Reuptake occurs:
   A) when the brain shifts functions from damaged areas to undamaged areas.
   B) when sodium ion and potassium ion channels open.
   C) in the small gaps in the axon called the nodes of Ranvier.
   D) when neurotransmitter molecules are reabsorbed by the presynaptic neuron.

6. Reduced brain levels of the neurotransmitter _____ is most notably involved in the progressive memory loss that characterizes Alzheimer's disease.
   A) GABA
   B) serotonin
   C) dopamine
   D) acetylcholine

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7. Lydia experiences a rush of euphoria after her daily five-mile run. This sensation is known as:
   A) neurogenesis.
   B) the runner's high.
   C) the synaptic rush.
   D) the split-brain high.

8. Nicotine is classified as a(n):
   A) endorphin.
   B) SSRI.
   C) agonist.
   D) antagonist.

9. The terms *autonomic* and *somatic* refer to the two main subdivisions of the _____ nervous system.
   A) sympathetic
   B) central
   C) peripheral
   D) parasympathetic

10. The _____ functions as the main link between the nervous system and the endocrine system.
   A) adrenal medulla
   B) adrenal cortex
   C) amygdala
   D) hypothalamus

11. Epinephrine and norepinephrine are manufactured by the _____ gland(s) in the _____ system.
   A) adrenal; endocrine
   B) pineal; endocrine
   C) thyroid; limbic
   D) pituitary; limbic

12. The brainstem is made up of the _____ and the _____.
   A) forebrain; midbrain
   B) cerebellum; medulla
   C) reticular formation; pons
   D) midbrain; hindbrain

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13. The _____ lobe primarily control's a person's ability to plan, initiate, and carry out voluntary movements and actions.
    A) frontal
    B) occipital
    C) parietal
    D) temporal

14. According to the box "Critical Thinking: "His" and "Her" Brains?", which of the following is FALSE?
    A) Men's brains tend to be much smaller than women's brains.
    B) Women and men have different proportions of gray to white matter in their brains.
    C) In general, the male brain is more asymmetrical and functions are more lateralized than in the female brain.
    D) Men's brains tend to be larger than women's brains.

15. Petro is unable to articulate ideas or understand spoken or written language because of brain damage. Petro suffers from:
    A) Parkinson's disease.
    B) Alzheimer's disease.
    C) the after effects of the split-brain operation.
    D) aphasia.

16. Psychologist and neuroscientist Roger Sperry is BEST known for:
    A) his efforts to debunk the pseudoscientific claims of phrenology.
    B) the discovery of neurogenesis in the adult human brain.
    C) his studies on split-brain patients.
    D) identifying the specific brain areas involved in different forms of aphasia.

17. Tom is a split-brain patient seated in front of a screen. As he focuses on the middle of the screen, the image of an apple is briefly flashed on the LEFT side of the screen. Tom will:
    A) be able to verbally name the object.
    B) be able to use his right hand to reach under the screen and pick up the correct object.
    C) verbally deny that any image appeared on the screen.
    D) probably have an epileptic seizure.

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18. Karen is right-handed. A biopsychologist administers a PET scan of Karen's brain while Karen listens to one of her favorite pieces of music, Beethoven's *Third Symphony*. Which area of Karen's brain is likely to show the greatest activity on the PET scan?
    A) Broca's area
    B) Wernicke's area
    C) the cerebellum
    D) the right hemisphere

19. According to Pereira's study on exercise and neurogenesis, discussed in Psych for Your Life: Maximizing Your Brain's Potential,:
    A) experience has minimal effect on brain functions or structures.
    B) exercising regularly decreases the release of endorphins in the brain.
    C) while exercise promotes the growth of new neurons in the brains of mammals, findings are mixed in humans.
    D) exercise promotes the growth of new neurons in the human brain, just as it does in other mammals.

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Answer Key

1. B
2. D
3. C
4. C
5. D
6. D
7. B
8. C
9. C
10. D
11. A
12. D
13. A
14. A
15. D
16. C
17. C
18. D
19. D

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