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| **Multiple Choice** |

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| 1. ​Biological psychology is best defined as the

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|   | a.  | science of brain and behavior.​ |
|   | b.  | ​study of the mind. |
|   | c.  | study of behavior and mental processes.​ |
|   | d.  | branch of psychology that studies the biological foundations of behavior, emotions, and mental processes.​ |

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| *ANSWER:* | d |

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| 2. ​Given what you've learned in this course so far, it is important for you to learn about the brain if you want to be a counselor and not a researcher because you need to

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|   | a.  | ​be able to prescribe medications correctly for your clients. |
|   | b.  | ​know as much as a neuroscientist. |
|   | c.  | ​be able to diagnose mental illness when you talk to people. |
|   | d.  | ​be able to recognize the possibility of some kind of neurological condition behind what appears to be psychological. |

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| *ANSWER:* | d |

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| 3. ​You are a licensed clinical counselor. A 35-year-old woman comes to you who has always been very optimistic and cheerful, but suddenly is extremely depressed. There has been no change in her life circumstances, and she is aware of nothing that could be causing this depression. Given what you have learned so far, what is the first thing you might suggest to her?

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|   | a.  | She should see a psychiatrist and get medication for the depression first and foremost, then talk therapy will probably be able to help her.​ |
|   | b.  | She probably has some deep underlying resentment of her parents that she needs to admit to before she will be able to get better.​ |
|   | c.  | ​She should see her doctor for a complete physical, and perhaps even see a neurologist to rule out any underlying physical problem. |
|   | d.  | The whole family should come in for therapy, as there is obviously something going on somewhere that is not obvious.​ |

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| *ANSWER:* | c |

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| 4. ​Trepanation is a(an)

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|   | a.  | ​ancient practice of drilling holes in a person's skull. |
|   | b.  | ​technique involving the analysis of the bumps on the skull. |
|   | c.  | ​type of mummification. |
|   | d.  | ​postmortem ritual. |

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| *ANSWER:* | a |

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| 5. ​During the process of mummification, early Egyptians discarded the

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|   | a.  | ​stomach. |
|   | b.  | ​lungs. |
|   | c.  | ​heart. |
|   | d.  | brain.​ |

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| *ANSWER:* | d |

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| 6. The process of trepanation

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|   | a.  | ​appears to have been performed after a person died. |
|   | b.  | ​was first used during the sixteenth century in Europe. |
|   | c.  | ​may have been done to release demons or relieve feelings of pressure. |
|   | d.  | ​always killed the patient. |

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| *ANSWER:* | c |

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| 7. ​The Egyptian author of the *Edwin Smith Surgical Papyrus* understood that

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|   | a.  | ​functions can be localized in the brain and the spinal cord, both of which comprise the central nervous system. |
|   | b.  | ​the brain is the source of every documented type of intelligence. |
|   | c.  | ​the brain is made up of trillions of separate cells. |
|   | d.  | ​paralysis and lack of sensation in the body resulted from nervous system damage. |

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| *ANSWER:* | d |

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| 8. ​The Egyptian author of the *Edwin Smith Surgical Papyrus* understood that

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|   | a.  | ​the ventricles are not the source of behavior. |
|   | b.  | information about sensation and movement is carried by separate nerves.​ |
|   | c.  | epilepsy is a brain disturbance.​ |
|   | d.  | most nervous system damage is relatively permanent.​ |

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| *ANSWER:* | d |

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| 9. ​Which of the follow provide(s) evidence for early, accurate understanding of the function of the human brain?

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|   | a.  | ​phrenology |
|   | b.  | Egyptian mummification​ |
|   | c.  | the *Edwin Smith Surgical Papyrus* and the writings of Hippocrates |
|   | d.  | trepanation and the writings of Aristotle​ |

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| *ANSWER:* | c |

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| 10. ​Who correctly identified epilepsy as originating in the brain?

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|   | a.  | ​Galen |
|   | b.  | ​Aristotle |
|   | c.  | ​Herophilus |
|   | d.  | ​Hippocrates |

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| *ANSWER:* | d |

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| 11. ​Which of the following thinkers believed that the ventricles played an important role in transmitting information to and from the brain?

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|   | a.  | Descartes​ |
|   | b.  | Galen​ |
|   | c.  | ​Aristotle |
|   | d.  | Herophilus​ |

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| *ANSWER:* | b |

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| 12. ​What mistaken notion about the nervous system persisted from ancient times up through the work of some Renaissance thinkers?

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|   | a.  | ​The muscular tremors that characterize epilepsy do not originate in the brain. |
|   | b.  | ​Damage to the brain is easily repaired. |
|   | c.  | ​The heart is the organ of intellect. |
|   | d.  | ​The ventricles play a major role in the transmission of messages in the brain. |

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| *ANSWER:* | d |

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| 13. ​According to Descartes, the mind

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|   | a.  | ​forms an indivisible whole with the body. |
|   | b.  | ​is the product of neural activity. |
|   | c.  | ​is not a physical entity that can be studied. |
|   | d.  | ​exists in both human and non-human animals. |

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| *ANSWER:* | c |

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| 14. ​Descartes' mind-body dualism is defined as a philosophical view that considers

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|   | a.  | reality to exist only when perceived by an observer.​ |
|   | b.  | the senses as the source of knowledge.​ |
|   | c.  | mind and body to be separate entities.​ |
|   | d.  | ​mind to be the product of neural activity. |

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| *ANSWER:* | c |

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| 15. ​Your former roommate's personality has changed a great deal since an accident injured his frontal cortex. This observation offers support for the \_\_\_\_\_\_\_\_\_ view of the mind-body connection.

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|   | a.  | ​dualistic |
|   | b.  | ​phrenologistic |
|   | c.  | socialization |
|   | d.  | monistic​​ |

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| *ANSWER:* | d |

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| 16. ​Anton van Leeuwenhoek advanced brain science by

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|   | a.  | ​inventing the light microscope. |
|   | b.  | ​demonstrating that sensory and motor information travel along separate pathways. |
|   | c.  | ​demonstrating that neurons communicate via electricity. |
|   | d.  | ​proposing the Neuron Doctrine. |

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| *ANSWER:* | a |

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| 17. ​\_\_\_\_\_\_\_\_ established electricity as the mode of communication used by the nervous system.

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|   | a.  | ​van Leeuwenhoek. |
|   | b.  | ​Descartes. |
|   | c.  | ​Golgi and Cajal. |
|   | d.  | ​Galvani and du Bois-Reymond. |

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| *ANSWER:* | d |

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| 18. ​The Neuron Doctrine pertains to the

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|   | a.  | ​localization of language to the left hemisphere. |
|   | b.  | ​separate pathways used for processing sensory and motor information |
|   | c.  | ​use of electricity by neurons in communication. |
|   | d.  | ​nervous system as a collection of separate cells. |

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| *ANSWER:* | d |

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| 19. ​The Neuron Doctrine was proposed by

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|   | a.  | ​Camillo Golgi. |
|   | b.  | Bell and Magendie.​ |
|   | c.  | ​Santiago Ramón y Cajal. |
|   | d.  | ​Descartes. |

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| *ANSWER:* | c |

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| 20. ​Which of the following made the Neuron Doctrine possible?

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|   | a.  | the ability to apply electricity through wires​ |
|   | b.  | fewer restrictions on animal research​ |
|   | c.  | fewer restrictions on human dissection​ |
|   | d.  | ​the light microscope and the use of stains in histology |

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| *ANSWER:* | d |

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| 21. ​We know today that Santiago Ramón y Cajal’s Neuron Doctrine is true, but what theory competed with the Neuron doctrine as recently as the early 1900s?

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|   | a.  | ​phrenology |
|   | b.  | ​Camillo Golgi’s view of the nervous system as an interconnected network |
|   | c.  | ​the Bell-Magendie law |
|   | d.  | ​Luigi Galvani’s proposal that nerves communicate using electricity |

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| *ANSWER:* | b |

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| 22. ​Phrenology is a

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|   | a.  | misguided attempt to correlate personality with bumps in the skull.​ |
|   | b.  | method for imaging brain activity.​ |
|   | c.  | method for fixing neural tissue.​ |
|   | d.  | ​technique for staining neural tissue. |

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| *ANSWER:* | a |

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| 23. ​Gall and Spurzheim are responsible for

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|   | a.  | ​demonstrating that sensory and motor information uses separate pathways. |
|   | b.  | ​establishing the electrical nature of neural communication. |
|   | c.  | ​proposing the “science” of phrenology. |
|   | d.  | ​the Neuron Doctrine. |

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| *ANSWER:* | c |

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| 24. ​Although phrenology is mostly wrong, what did phrenologists get right about the nervous system?

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|   | a.  | Neurons communicate using electrical signals.​ |
|   | b.  | ​The ventricles play a major role in the transmission of messages in the brain. |
|   | c.  | Sensation and movement have separate pathways.​ |
|   | d.  | Some functions can be localized in the brain.​ |

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| *ANSWER:* | d |

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| 25. ​Localization of function in the brain became established in large part due to the work of

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|   | a.  | ​Broca, Fritsch, and Hitzig. |
|   | b.  | ​Descartes. |
|   | c.  | ​Santiago Ramón y Cajal.  |
|   | d.  | ​Hughlings Jackson. |

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| *ANSWER:* | a |

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| 26. ​The localization of language functions in the brain was observed by

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|   | a.  | ​Fritsch and Hitzig. |
|   | b.  | ​Camillo Golgi. |
|   | c.  | ​Paul Broca. |
|   | d.  | ​Santiago Ramón y Cajal. |

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| *ANSWER:* | c |

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| 27. ​Experiments in which the cortices of rabbits and dogs were stimulated electrically were carried out by

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| --- | --- | --- |
|   | a.  | ​ Camillo Golgi. |
|   | b.  | ​Santiago Ramón y Cajal. |
|   | c.  | ​Fritsch and Hitzig. |
|   | d.  | ​Paul Broca. |

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| *ANSWER:* | c |

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| 28. ​The work of Fritz and Hitzig provided further evidence for the

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|   | a.  | ​Neuron Doctrine. |
|   | b.  | accuracy phenomenon.​ |
|   | c.  | localization of some functions in the brain.​ |
|   | d.  | Bell-Magendie law.​ |

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| *ANSWER:* | c |

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| 29. ​Dr. Jones argues that higher levels of the brain inhibit aggressive impulses originating in lower levels of the brain. It is likely that Dr. Jones has been most directly influenced in her thinking by the work of

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|   | a.  | ​Santiago Ramón y Cajal |
|   | b.  | ​John Hughlings Jackson. |
|   | c.  | ​Franz Josef Gall. |
|   | d.  | ​Luigi Galvani. |

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| *ANSWER:* | b |

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| 30. ​John Hughlings Jackson is best known for

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|   | a.  | mind-body dualism.​ |
|   | b.  | ​demonstrating the localization of language in the brain. |
|   | c.  | the Neuron Doctrine.​ |
|   | d.  | viewing the nervous system as a hierarchy.​ |

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| *ANSWER:* | d |

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| 31. ​The term “synapse,” meaning the point of communication between two neurons, was first used by

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|   | a.  | ​Charles Sherrington. |
|   | b.  | ​Otto Loewi. |
|   | c.  | ​Santiago Ramón y Cajal. |
|   | d.  | ​John Hughlings Jackson. |

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| *ANSWER:* | a |

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| 32. ​“Fixing” tissue to be viewed refers to

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|   | a.  | ​slicing tissue into thin slices. |
|   | b.  | ​mounting tissue on slides. |
|   | c.  | ​preserving the tissue by freezing or by the use of formalin. |
|   | d.  | ​deciding which tissue to observe. |

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| *ANSWER:* | c |

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| 33. ​The existence of chemical signaling at the synapse was first demonstrated by

|  |  |  |
| --- | --- | --- |
|   | a.  | ​Otto Loewi. |
|   | b.  | Santiago Ramón y Cajal.​ |
|   | c.  | ​John Hughlings-Jackson. |
|   | d.  | ​Charles Sherrington. |

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| *ANSWER:* | a |

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| 34. ​The study of microscopic structures and tissues is known as

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| histology. |

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| histology. |

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| histology. |

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|   | a.  | ​staining. |
|   | b.  | ​imaging. |
|   | c.  | phrenology. |
|   | d.  | ​histology. |

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| *ANSWER:* | d |

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| 35. ​A microtome is a

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|   | a.  | ​stain. |
|   | b.  | ​type of microscope. |
|   | c.  | ​machine used to slice tissue. |
|   | d.  | ​fixative.  |

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| *ANSWER:* | c |

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| 36. ​If you want to observe a small number of cells in detail, it would be best to use the

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|   | a.  | ​horseradish peroxidase stain. |
|   | b.  | ​Golgi silver stain. |
|   | c.  | ​myelin stain. |
|   | d.  | Nissl stain.​ |

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| *ANSWER:* | b |

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| 37. ​If you want to identify clusters of cell bodies in a sample of tissue, it would be best to use the

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| --- | --- | --- |
|   | a.  | ​Golgi silver stain. |
|   | b.  | ​myelin stain. |
|   | c.  | ​horseradish peroxidase stain. |
|   | d.  | ​Nissl stain. |

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| *ANSWER:* | d |

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| 38. ​To follow the pathways carrying information from one part of the brain to another, it would be best to use the

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|   | a.  | ​Nissl stain. |
|   | b.  | ​antibody stain. |
|   | c.  | ​Golgi silver stain. |
|   | d.  | ​myelin stain. |

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| *ANSWER:* | d |

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| 39. ​Particular proteins in cells can be identified using \_\_\_\_\_\_\_\_ in a process known as immunohistochemistry.

|  |  |  |
| --- | --- | --- |
|   | a.  | ​ antibodies |
|   | b.  | ​the Golgi silver stain.   |
|   | c.  | ​the Nissl stain |
|   | d.  | ​horseradish peroxidase |

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| *ANSWER:* | a |

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| 40. ​If you want to locate a pathway's point of origin, it would be best to use

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| --- | --- | --- |
|   | a.  | ​the Nissl stain.  |
|   | b.  | ​the myelin stain. |
|   | c.  | ​horseradish peroxidase. |
|   | d.  | ​the Golgi silver stain. |

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| *ANSWER:* | c |

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| 41. ​A researcher is interested in discovering if one part of the brain, the orbitofrontal cortex, connects directly to another part of the brain, the amygdala. Which of the following experimental methods would be the most appropriate for this purpose?

|  |  |  |
| --- | --- | --- |
|   | a.  | Stimulate the orbitofrontal cortex of a human volunteer during neurosurgery.​ |
|   | b.  | Look at a human brain with fMRI to see if the orbitofrontal cortex and amygdala are active at the same times.​ |
|   | c.  | ​Inject horseradish peroxidase into a rat's amygdala and then see if cells in the orbitofrontal cortex are stained. |
|   | d.  | Inject a human volunteer with a radioactive glucose and see what part of his brain is active while viewing an emotionally charged set of pictures using a PET scan.​ |

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| *ANSWER:* | c |

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| 42. ​Electron microscopes are capable of magnifications up to \_\_\_\_\_\_\_\_\_ times.

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|   | a.  | ​1 million |
|   | b.  | ​100,000 |
|   | c.  | ​1000 |
|   | d.  | ​10 million |

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| *ANSWER:* | a |

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| 43. ​Examination of a body after death is known as

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| --- | --- | --- |
|   | a.  | ​histology. |
|   | b.  | ​fixing. |
|   | c.  | ​autopsy.   |
|   | d.  | ​phrenology. |

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| *ANSWER:* | c |

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| 44. ​Structures at the synapse may be viewed with

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|   | a.  | ​the naked eye. |
|   | b.  | ​light microscope. |
|   | c.  | ​a CT scanner. |
|   | d.  | ​an electron microscope. |

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| *ANSWER:* | d |

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| 45. ​In his study of the biology of sexual orientation, Simon LeVay (1991) used the method of

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| --- | --- | --- |
|   | a.  | ​phrenology. |
|   | b.  | ​fMRI. |
|   | c.  | ​CT scanning. |
|   | d.  | autopsy.​ |

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| *ANSWER:* | d |

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| 46. ​Computerized tomography (CT) scanning is based on

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| --- | --- | --- |
|   | a.  | ​histology. |
|   | b.  | ​X-ray technology. |
|   | c.  | ​the gamma camera. |
|   | d.  | ​magnetism. |

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| *ANSWER:* | b |

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| 47. ​Modern computerized tomography (CT) images differ from earlier versions in that they

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| --- | --- | --- |
|   | a.  | can be used to measure activity in a structure.​ |
|   | b.  | are safer for the participant as well as the X-ray technician.​ |
|   | c.  | can be used to construct three-dimensional images.​ |
|   | d.  | ​no longer use X-rays. |

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| *ANSWER:* | c |

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| 48. ​Positron emission tomography (PET) scans were made possible by the development of

|  |  |  |
| --- | --- | --- |
|   | a.  | ​the gamma camera. |
|   | b.  | ​powerful magnets. |
|   | c.  | ​histology techniques. |
|   | d.  | ​X-rays. |

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| *ANSWER:* | a |

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| 49. ​Positron emission tomography (PET) scans

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|   | a.  | expose the participant to strong magnets.​ |
|   | b.  | require the participant to wear a helmet containing sensors.​ |
|   | c.  | utilize detectors of radioactive tracers.​ |
|   | d.  | ​expose the participant to X-rays. |

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| *ANSWER:* | c |

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| 50. ​In positron emission tomography (PET) scans, colors are assigned that reflect the

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| --- | --- | --- |
|   | a.  | ​density of tissue in a particular area. |
|   | b.  | ​amount of activity in a particular area of the brain. |
|   | c.  | ​response of the cells in a particular area to magnetism. |
|   | d.  | ​magnetic output of an area of the brain. |

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| *ANSWER:* | b |

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| 51. ​A red area in a positron emission tomography (PET) scan typically indicates that the area is showing \_\_\_\_\_\_\_\_ activity.

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|   | a.  | ​high |
|   | b.  | ​low |
|   | c.  | moderate​ |
|   | d.  | ​no |

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| *ANSWER:* | a |

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| 52. ​Magnetic resonance imaging (MRI) technology is based on

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|   | a.  | ​the gamma camera. |
|   | b.  | ​X-rays. |
|   | c.  | ​magnetism. |
|   | d.  | ​radioactivity |

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| *ANSWER:* | c |

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| 53. ​In magnetic resonance imaging (MRI) technology, powerful magnets are used to align

|  |  |  |
| --- | --- | --- |
|   | a.  | ​glucose molecules. |
|   | b.  | ​hydrogen atoms.  |
|   | c.  | ​water molecules. |
|   | d.  | ​oxygen atoms. |

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| *ANSWER:* | b |

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| 54. ​In magnetic resonance imaging (MRI) technology, the area of the body to be imaged is exposed to

|  |  |  |
| --- | --- | --- |
|   | a.  | ​radio frequency (RF) pulses. |
|   | b.  | ​X-rays. |
|   | c.  | ​radioactivity. |
|   | d.  | ​a gamma camera. |

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| *ANSWER:* | a |

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| 55. ​Functional magnetic resonance imaging (fMRI) requires

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| --- | --- | --- |
|   | a.  | ​multiple images taken in a short period of time. |
|   | b.  | ​larger numbers of gamma cameras than in MRI. |
|   | c.  | ​stronger magnets than those used in MRI. |
|   | d.  | ​the injection of radioactive substances into the participant. |

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| *ANSWER:* | a |

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| 56. ​In magnetic resonance imaging technologies, we use the term “voxel” to refer to

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|   | a.  | a gamma ray released during the breakdown of a radioactive tracer.​ |
|   | b.  | a small area of tissue to be assigned a pixel of appropriate color or darkness.​ |
|   | c.  | ​the rate at which atoms spin. |
|   | d.  | the strength of the magnets being used.​ |

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| *ANSWER:* | b |

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| 57. ​Functional magnetic resonance imaging takes advantage of the fact that compared with less active neurons, more active neurons require greater amounts of

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| --- | --- | --- |
|   | a.  | ​hydrogen. |
|   | b.  | ​magnetism. |
|   | c.  | oxygen.​ |
|   | d.  | ​gamma radiation. |

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| *ANSWER:* | c |

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| 58. ​Which of the following contemporary technologies was previewed by nineteenth century physiologist Angelo Mosso’s work with patients who had head injuries?

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| --- | --- | --- |
|   | a.  | ​positron emission tomography (PET) |
|   | b.  | electroencephalography​ |
|   | c.  | functional magnetic resonance imaging (fMRI)​ |
|   | d.  | computerized tomography (CT)​ |

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| *ANSWER:* | c |

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| 59. ​Hemoglobin’s magnetic properties change when it is

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|   | a.  | ​combined with oxygen. |
|   | b.  | ​combined with glucose. |
|   | c.  | ​exposed to X-rays. |
|   | d.  | ​bombarded with gamma rays. |

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| *ANSWER:* | a |

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| 60. ​The BOLD effect is important in which of the following technologies?

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| --- | --- | --- |
|   | a.  | electroencephalography (EEG)​ |
|   | b.  | functional magnetic resonance imaging (fMRI)​ |
|   | c.  | computerized tomography (CT)​ |
|   | d.  | ​positron emission tomography (PET) |

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| *ANSWER:* | b |

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| 61. ​Compared with positron emission tomography (PET) scans, functional magnetic resonance imaging (fMRI) provides

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| --- | --- | --- |
|   | a.  | more economical imaging.​ |
|   | b.  | fewer side effects.​ |
|   | c.  | better structural resolution.​ |
|   | d.  | ​more information about brain activity. |

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| *ANSWER:* | d |

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| 62. ​Although his ability to speak is otherwise normal, a patient suffering from a stroke is having difficulty naming common everyday objects, such as tools. In order to determine which part of the brain is functioning abnormally, his doctor may use which of the following techniques?

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| --- | --- | --- |
|   | a.  | Do a CT scan on the brain to see what area is not functioning.​ |
|   | b.  | Use functional magnetic resonance imaging (fMRI) to compare the activity of the brains of the patient and normal volunteers when they are presented with pictures of various tools.​ |
|   | c.  | During neurosurgery on the patient, stimulate his brain to see what part is not functioning.​ |
|   | d.  | ​Inject the patient with horseradish peroxidase and look at his brain during an autopsy. |

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| *ANSWER:* | b |

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| 63. ​Naomi Eisenberger and her colleagues are interested in whether or not brain activity correlates with feelings of social rejection. If you were advising Dr. Eisenberger, which technology would you recommend for her study?

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| --- | --- | --- |
|   | a.  | ​positron emission tomography (PET) |
|   | b.  | electroencephalography (EEG)​ |
|   | c.  | computerized tomography (CT)​ |
|   | d.  | functional magnetic resonance imaging (fMRI)​ |

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| *ANSWER:* | d |

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| 64. ​The first electroencephalogram (EEG) recordings were made by

|  |  |  |
| --- | --- | --- |
|   | a.  | ​Hans Berger. |
|   | b.  | ​Wilhelm Röntgen. |
|   | c.  | ​Hounsfield and Cormack. |
|   | d.  | ​Phelps and Hoffman. |

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| *ANSWER:* | a |

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| 65. ​Traditionally, electroencephalography (EEG) is most commonly used to study

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| --- | --- | --- |
|   | a.  | ​learning and memory. |
|   | b.  | ​emotion. |
|   | c.  | ​psychopathology.  |
|   | d.  | ​states of consciousness and epilepsy. |

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| *ANSWER:* | d |

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| 66. ​Quantitative analysis of modern electroencephalography (EEG) recordings can be used to

|  |  |  |
| --- | --- | --- |
|   | a.  | assess learning and memory processes.​ |
|   | b.  | ​construct 3-D maps of brain activity. |
|   | c.  | track the utilization of glucose and oxygen by the brain.​ |
|   | d.  | generate high resolution images of brain structures.​ |

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| *ANSWER:* | b |

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| 67. ​Following a serious car accident, Joan fell into a coma. Her doctors are most likely to assess her progress using which of the following technologies?

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| --- | --- | --- |
|   | a.  | computerized tomography (CT)​ |
|   | b.  | ​positron emission tomography (PET) |
|   | c.  | electroencephalography (EEG)​ |
|   | d.  | functional magnetic resonance imaging (fMRI)​ |

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| *ANSWER:* | c |

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| 68. ​Future law enforcement personnel are most likely to be able to use which of the following technologies in order to assess whether a person is being truthful or not?

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| --- | --- | --- |
|   | a.  | ​positron emission tomography (PET) |
|   | b.  | functional magnetic resonance imaging (fMRI)​ |
|   | c.  | repeated transcranial magnetic stimulation (rTMS)​ |
|   | d.  | magnetoencephalography (MEG)​ |

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| *ANSWER:* | b |

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| 69. ​Jeremy’s physician suspects that he might have attention deficit hyperactivity disorder. Which of the following technologies is the physician likely to use to determine a diagnosis?

|  |  |  |
| --- | --- | --- |
|   | a.  | computerized tomography​ |
|   | b.  | functional magnetic resonance imaging​ |
|   | c.  | EEG brain tomography​ |
|   | d.  | ​positron emission tomography |

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| *ANSWER:* | c |

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| 70. ​The analysis of evoked potentials is based on

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| --- | --- | --- |
|   | a.  | electroencephalography (EEG).​ |
|   | b.  | positron emission tomography (PET).​ |
|   | c.  | functional magnetic resonance imaging (fMRI).​ |
|   | d.  | ​computerized tomography (CT). |

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| *ANSWER:* | a |

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| 71. ​A technique that is often used to determine whether or not a stimulus has been perceived by the brain is

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| --- | --- | --- |
|   | a.  | the recording of electrical activity from the brain during surgery.​ |
|   | b.  | magnetic resonance imaging (MRI).​ |
|   | c.  | positron emission tomography (PET).​ |
|   | d.  | ​the analysis of evoked potentials. |

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| *ANSWER:* | d |

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| 72. ​Matthew’s parents are concerned about the possibility that he might have either a hearing loss or autism spectrum disorder, as he has not learned to speak and is not responsive to their efforts to speak to him. Which of the following technologies might assist Matthew’s physician in making an accurate diagnosis?

|  |  |  |
| --- | --- | --- |
|   | a.  | computerized tomography (CT)​ |
|   | b.  | positron emission tomography (PET)​ |
|   | c.  | functional magnetic resonance imaging (fMRI)​ |
|   | d.  | ​analysis of evoked potentials |

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| *ANSWER:* | d |

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| 73. ​Magnetoencephalography (MEG) involves the

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| --- | --- | --- |
|   | a.  | recording of the magnetic output of the brain.​ |
|   | b.  | recording of electrical activity from the brain during surgery.​ |
|   | c.  | recording of electrical activity from the brain through electrodes placed on the scalp.​ |
|   | d.  | ​analysis of evoked potentials. |

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| *ANSWER:* | a |

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| 74. ​The skull bones and other tissues separating the brain from electrodes can create a problem by blocking

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| --- | --- | --- |
|   | a.  | neither the brain's electrical nor its magnetic output.​ |
|   | b.  | ​the brain's electrical output more than its magnetic output. |
|   | c.  | the brain's magnetic output more than its electrical output.​ |
|   | d.  | the brain's magnetic and electrical output equally.​ |

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| *ANSWER:* | b |

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| 75. ​Magnetoencephalography (MEG) recordings may be taken

|  |  |  |
| --- | --- | --- |
|   | a.  | faster than functional magnetic resonance imaging (fMRI), but more slowly than positron emission tomography (PET) scans.​ |
|   | b.  | ​at the same rate as positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) scans. |
|   | c.  | faster than positron emission tomography (PET), but more slowly than functional magnetic resonance imaging (fMRI) scans.​ |
|   | d.  | faster than both positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) scans.​ |

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| *ANSWER:* | d |

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| 76. ​Why is magnetoencephalography (MEG) more useful than functional magnetic resonance imaging (fMRI) for studying participants’ responses to quiet sounds?

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| --- | --- | --- |
|   | a.  | MEG equipment is much cheaper and easier to use than fMRI equipment.​ |
|   | b.  | The magnets used in fMRI are very noisy, blocking the ability to sense quiet sounds.​ |
|   | c.  | Neither of these technologies is suitable for assessing participants’ responses to sound.​ |
|   | d.  | MEG recordings of brain activity must be taken more slowly than fMRI images, allowing a more accurate assessment of brain activity.​ |

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| *ANSWER:* | b |

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| 77. ​The technology illustrated in this figure allows researchers to

|  |  |  |
| --- | --- | --- |
|   | a.  | identify the effects of magnetic stimulation of the brain.​ |
|   | b.  | identify areas of the brain that have been lesioned.​ |
|   | c.  | research the electrical output of the brain.​ |
|   | d.  | ​research the magnetic output of the brain. |

|  |  |
| --- | --- |
| *ANSWER:* | d |

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| 78. ​SQUID sensors are used in

|  |  |  |
| --- | --- | --- |
|   | a.  | electroencephalography (EEG).​ |
|   | b.  | functional magnetic resonance imaging (fMRI).​ |
|   | c.  | ​positron emission tomography (PET) scans. |
|   | d.  | magnetoencephalography (MEG).​ |

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| --- | --- |
| *ANSWER:* | d |

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| 79. ​Magnetoencephalography (MEG) results are usually superimposed on images obtained by

|  |  |  |
| --- | --- | --- |
|   | a.  | positron emission tomography (PET) scans.​ |
|   | b.  | magnetic resonance imaging (MRI).​ |
|   | c.  | ​computerized tomography (CT) scans. |
|   | d.  | electroencephalography (EEG).​ |

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| --- | --- |
| *ANSWER:* | b |

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| 80. ​Which of the following technologies are most useful in analyzing brain activity during a seizure?

|  |  |  |
| --- | --- | --- |
|   | a.  | magnetoencephalography​ |
|   | b.  | magnetic resonance imaging​ |
|   | c.  | positron emission tomography ​ |
|   | d.  | ​computerized tomography |

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| --- | --- |
| *ANSWER:* | a |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 81. ​In order to study the visual cortex of animals, Mountcastle, Hubel, and Wiesel used which of the following technologies?

|  |  |  |
| --- | --- | --- |
|   | a.  | ​magnetoencephalography |
|   | b.  | evoked potentials​ |
|   | c.  | ​electroencephalography |
|   | d.  | ​single cell recordings |

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| --- | --- |
| *ANSWER:* | d |

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| 82. ​In order to do a single cell recording, electrode tips

|  |  |  |
| --- | --- | --- |
|   | a.  | must be positioned on the surface of the skull bones.​ |
|   | b.  | must be arrayed on the surface of the scalp.​ |
|   | c.  | ​contained in SQUIDS must be positioned over the area of interest. |
|   | d.  | must be surgically implanted.​ |

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| *ANSWER:* | d |

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| 83. The purpose of stimulation research is to​

|  |  |  |
| --- | --- | --- |
|   | a.  | observe individual ion channels in the membranes of neurons.​ |
|   | b.  | ​identify stimuli that activate a particular part of the brain. |
|   | c.  | observe the activity of a particular part of the brain.​ |
|   | d.  | identify the function of a part of the brain.​ |

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| *ANSWER:* | d |

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| 84. ​Wilder Penfield and Robert Heath used which of the following techniques with their human participants?

|  |  |  |
| --- | --- | --- |
|   | a.  | magnetoencephalography (MEG)​ |
|   | b.  | ​patch clamps |
|   | c.  | ​single cell recording |
|   | d.  | ​electrical stimulation |

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| --- | --- |
| *ANSWER:* | d |

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| 85. ​Why is it common practice to conduct neurosurgery under local anesthesia instead of general anesthesia?

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| --- | --- | --- |
|   | a.  | General anesthesia is more expensive, so this is a good way to save money on medical care.​ |
|   | b.  | The person undergoing a neurosurgical procedure is unable to tell which type of anesthesia is being used.​ |
|   | c.  | General anesthesia does not last as long as local anesthesia, so is not suitable for lengthy procedures.​ |
|   | d.  | ​The brain itself has no pain reception, and it is useful for the neurosurgeon to be able to converse with a patient during a procedure. |

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| *ANSWER:* | d |

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| 86. ​Repeated transcranial magnetic stimulation (rTMS) appears to be a promising treatment for which of the following psychological disorders?

|  |  |  |
| --- | --- | --- |
|   | a.  | autism and schizophrenia​ |
|   | b.  | attention deficit hyperactivity disorder and autism​ |
|   | c.  | ​schizophrenia and depression |
|   | d.  | depression and attention deficit hyperactivity disorder​ |

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| --- | --- |
| *ANSWER:* | c |

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| 87. ​Colin’s schizophrenia is responding well to his medication, but he continues to be bothered by auditory hallucinations, in which voices continually criticize his actions. Colin’s physician might try which of the following technologies in order to provide him with relief from these troubling symptoms?

|  |  |  |
| --- | --- | --- |
|   | a.  | electrical stimulation of the auditory cortex​ |
|   | b.  | lesions of the auditory cortex​ |
|   | c.  | ​repeated transcranial magnetic stimulation |
|   | d.  | gene therapy​ |

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| --- | --- |
| *ANSWER:* | c |

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| 88. ​Which technology has been shown to produce temporary increases in specific cognitive abilities, such as the ability to perform complicated mental calculations quickly, in healthy participants?

|  |  |  |
| --- | --- | --- |
|   | a.  | electroencephalography (EEG)​ |
|   | b.  | functional magnetic resonance imaging (fMRI)​ |
|   | c.  | repeated transcranial magnetic stimulation (rTMS)​ |
|   | d.  | ​magnetoencephalography (MEG) |

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| *ANSWER:* | c |

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| 89. ​The genetic insertion of molecules into specific neurons that allows the activity of the neurons to be controlled by light is called \_\_\_\_\_\_\_\_.

|  |  |  |
| --- | --- | --- |
|   | a.  | dialectical genome manipulation​ |
|   | b.  | epigenetics​ |
|   | c.  | ​optogenetics |
|   | d.  | magnetoencephalography​ |

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| --- | --- |
| *ANSWER:* | c |

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| 90. ​The analysis of lesions allows researchers to

|  |  |  |
| --- | --- | --- |
|   | a.  | ​identify stimuli that activate a particular part of the brain. |
|   | b.  | identify the probably function of a specific brain area.​ |
|   | c.  | observe individual ion channels in the membranes of neurons.​ |
|   | d.  | observe the activity of a particular part of the brain.​ |

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| *ANSWER:* | b |

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| 91. ​Naturally occurring lesions identified after an autopsy were interpreted by

|  |  |  |
| --- | --- | --- |
|   | a.  | ​Simon LeVay. |
|   | b.  | ​Paul Broca. |
|   | c.  | ​Hounsfeld and Cormack. |
|   | d.  | ​Fritsch and Hitzig. |

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| --- | --- |
| *ANSWER:* | b |

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| 92. ​The use of experimentally induced lesions in animals was introduced by

|  |  |  |
| --- | --- | --- |
|   | a.  | ​Camillo Golgi. |
|   | b.  | ​Galvani. |
|   | c.  | ​Paul Broca. |
|   | d.  | Pierre Flourens.​ |

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| --- | --- |
| *ANSWER:* | d |

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| 93. ​Animals will gain up to two to three times their normal weight when the

|  |  |  |
| --- | --- | --- |
|   | a.  | lateral hypothalamus is stimulated.​ |
|   | b.  | ventromedial hypothalamus is lesioned.​ |
|   | c.  | ventromedial hypothalamus is stimulated.​ |
|   | d.  | ​lateral hypothalamus is lesioned. |

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| *ANSWER:* | b |

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| 94. ​The purpose of conducting research using the technique illustrated in this figure is to

|  |  |  |
| --- | --- | --- |
|   | a.  | identify the chemicals present in the target area of the brain.​ |
|   | b.  | ​discover the boundaries of the target area of the brain. |
|   | c.  | identify the function of the target area of the brain.​ |
|   | d.  | discover the connections to and from the target area of the brain.​ |

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| *ANSWER:* | c |

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| 95. ​When a large area of brain is surgically removed, we refer to the result as a(n)

|  |  |  |
| --- | --- | --- |
|   | a.  | microdialysis analysis.​ |
|   | b.  | ​ablation. |
|   | c.  | ​magnetoencephalogram (MEG). |
|   | d.  | ​lesion. |

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| --- | --- |
| *ANSWER:* | b |

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| 96. ​Permanent lesions are usually produced by applying

|  |  |  |
| --- | --- | --- |
|   | a.  | ​magnetism or cold. |
|   | b.  | ​heat or cold. |
|   | c.  | ​heat or chemicals. |
|   | d.  | ​cold or chemicals. |

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| *ANSWER:* | c |

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| 97. ​Reversible lesions are produced by applying

|  |  |  |
| --- | --- | --- |
|   | a.  | ​chemicals. |
|   | b.  | ​heat or cold. |
|   | c.  | cold.​ |
|   | d.  | ​heat. |

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| *ANSWER:* | c |

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| 98. ​Both lesions and electrical brain stimulation allow scientists to

|  |  |  |
| --- | --- | --- |
|   | a.  | ​observe the activity of a particular part of the brain. |
|   | b.  | observe the functions of particular parts of the brain.​ |
|   | c.  | identify stimuli that normally activate a particular part of the brain.​ |
|   | d.  | observe the biochemical environment in a particular area of the brain.​ |

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| *ANSWER:* | b |

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| 99. ​Dr. Wilson is interested in the functions of a nucleus found in the hypothalamus of rats. Which of the following technologies would you recommend to Dr. Wilson for answering this question?

|  |  |  |
| --- | --- | --- |
|   | a.  | single cell recording​ |
|   | b.  | lesioning and electrical brain stimulation​ |
|   | c.  | ​repeated transcranial magnetic stimulation |
|   | d.  | functional magnetic resonance imaging​ |

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| *ANSWER:* | b |

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| 100. ​Most chemicals in the blood supply

|  |  |  |
| --- | --- | --- |
|   | a.  | enter the brain as easily as other organs.​ |
|   | b.  | ​enter the brain more easily than other organs. |
|   | c.  | are less likely to enter the brain than other organs.​ |
|   | d.  | are unable to enter the brain or other organs.​ |

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| *ANSWER:* | c |

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| 101. ​Drugs that cause psychoactive effects

|  |  |  |
| --- | --- | --- |
|   | a.  | are only effective if administered through injection.​ |
|   | b.  | are unable to move from the blood supply into the brain, which is why people use methods like smoking and chewing to administer drugs.​ |
|   | c.  | ​and their behavioral effects are assessed most frequently by researchers using microdialysis techniques. |
|   | d.  | naturally gain access to the brain.​ |

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| *ANSWER:* | d |

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| 102. ​Researchers interested in the effects of a drug on an awake, freely moving animal are most likely to

|  |  |  |
| --- | --- | --- |
|   | a.  | sample the chemicals that are active in a precise location in the brain. |
|   | b.  | use microdialysis. |
|   | c.  | ​use surgically implanted micropipettes to administer precise amounts of the drug directly to the brain. |
|   | d.  | allow the animal to inhale, eat, or chew substances that contain precise amounts of the drug.​ |

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| *ANSWER:* | c |

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| 103. One of the challenges associated with the successful use of chemotherapy for treating brain tumors is the fact that

|  |  |  |
| --- | --- | --- |
|   | a.  | many circulating chemicals are not able to enter the brain. |
|   | b.  | no chemicals are ever able to pass from the blood supply to the brain. |
|   | c.  | chemicals introduced to the brain do not pass through neural membranes. |
|   | d.  | no known chemotherapy agents are effective against the types of tumors that arise in the brain. |

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| *ANSWER:* | a |

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| 104. ​Microdialysis is used to

|  |  |  |
| --- | --- | --- |
|   | a.  | identify the function of a small area of the brain.​ |
|   | b.  | apply chemicals directly to the brain.​ |
|   | c.  | ​assess the chemicals present in a very small area of the brain. |
|   | d.  | produce lesions.​ |

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| *ANSWER:* | c |

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| 105. ​Fraternal twins typically have about \_\_\_\_\_\_\_\_\_ percent of their genes in common.

|  |  |  |
| --- | --- | --- |
|   | a.  | ​25  |
|   | b.  | ​75 |
|   | c.  | 50​ |
|   | d.  | ​100 |

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| --- | --- |
| *ANSWER:* | c |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 106. ​Identical twins typically have about \_\_\_\_\_\_\_\_\_ percent of their genes in common.

|  |  |  |
| --- | --- | --- |
|   | a.  | ​75 |
|   | b.  | ​25 |
|   | c.  | ​50 |
|   | d.  | ​100 |

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| --- | --- |
| *ANSWER:* | d |

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| 107. ​Fraternal twins share

|  |  |  |
| --- | --- | --- |
|   | a.  | about the same number of genes as non-twin siblings.​ |
|   | b.  | fewer genes than non-twin siblings.​ |
|   | c.  | about the same number of genes as identical twins.​ |
|   | d.  | ​more genes than non-twin siblings but fewer genes than identical twins. |

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| *ANSWER:* | a |

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| 108. ​If we say that bipolar disorder has a concordance rate of 85 percent in monozygotic twins, we mean that

|  |  |  |
| --- | --- | --- |
|   | a.  | 85 percent of the time, bipolar disorder cannot be explained by genetic variables, even in monozygotic twins.​ |
|   | b.  | a parent with bipolar disorder has an 85 percent chance of passing the disorder to his or her monozygotic twins.​ |
|   | c.  | if one monozygotic (identical) twin has bipolar disorder, his or her twin has an 85 percent chance of being diagnosed with the disorder as well.​ |
|   | d.  | ​85 percent of the time bipolar disorder is the result of genetic influences shared by monozygotic twins. |

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| *ANSWER:* | c |

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| 109. ​If the concordance rate for alcoholism were 50 percent among identical twins, which of the following would be true?

|  |  |  |
| --- | --- | --- |
|   | a.  | If your twin struggles with alcoholism, you have an increased chance of having the same problem, but ultimately whether you do is also influenced by environmental factors.​ |
|   | b.  | If your father suffers from alcoholism, you will not develop the problem as long as he is not involved in raising you.​ |
|   | c.  | If there is no alcoholism in your family, you will never develop a problem with alcoholism.​ |
|   | d.  | ​If you inherit the gene that encodes alcoholism, you will develop alcoholism. |

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| *ANSWER:* | a |

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| 110. ​If a trait were primarily influenced by genetic variables, we would expect to see

|  |  |  |
| --- | --- | --- |
|   | a.  | strong similarities between adoptive children and their adoptive siblings.​ |
|   | b.  | adopted children who are more similar to their adoptive parents in the trait than to their biological parents.​ |
|   | c.  | ​adopted children who are more similar to their biological parents in the trait than to their adoptive parents. |
|   | d.  | strong similarities between adoptive and biological parents.​ |

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| *ANSWER:* | c |

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| 111. ​What is the best definition of heritability?

|  |  |  |
| --- | --- | --- |
|   | a.  | the proportion of traits in an individual that are not influenced by environmental variables​ |
|   | b.  | the amount that a trait varies in a population that is due to genetics​ |
|   | c.  | the likelihood that a parent will pass on a particular trait to his or her offspring​ |
|   | d.  | ​the amount of an individual’s phenotype that is due to genetic influences |

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| --- | --- |
| *ANSWER:* | b |

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| 112. ​The similarities that are often seen among families that adopt children might have which of the following effects on analyses of the heritability of traits?

|  |  |  |
| --- | --- | --- |
|   | a.  | ​exaggeration of environmental influences |
|   | b.  | environmental influences that cannot be observed​ |
|   | c.  | magnification of genetic influences​ |
|   | d.  | underestimation of genetic influences​ |

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| --- | --- |
| *ANSWER:* | c |

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| 113. ​Dr. Campos is studying variations of intelligence among children living in a very affluent community, in which most parents are college-educated and schools are highly ranked. It is likely that using this relatively homogeneous group of participants will distort Dr. Campos’ results by

|  |  |  |
| --- | --- | --- |
|   | a.  | ​exaggerating genetic influences on intelligence. |
|   | b.  | exaggerating individual differences in intelligence.​ |
|   | c.  | exaggerating environmental influences on intelligence.​ |
|   | d.  | causing her to underestimate genetic influences on intelligence.​ |

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| *ANSWER:* | a |

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| 114. ​A knockout gene is one

|  |  |  |
| --- | --- | --- |
|   | a.  | in which a mutation has occurred in one or more of its alleles​ |
|   | b.  | ​that is missing in an organism. |
|   | c.  | that does not produce the protein product of a normal gene​ |
|   | d.  | that produces disease or death in more than 50 percent of those who have the gene.​ |

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| *ANSWER:* | c |

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| 115. ​“Pluripotent” stem cells are derived from

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|   | a.  | ​adult stem cells. |
|   | b.  | ​blastocysts. |
|   | c.  | ​umbilical cord blood. |
|   | d.  | ​cells from the cornea of the eye. |

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| *ANSWER:* | b |

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| 116. ​A disadvantage of embryonic stem cells is that they

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|   | a.  | ​can provoke immune responses in the recipient. |
|   | b.  | can differentiate into a very limited number of tissue types, most of which are not very useful in treating illness and injury.​ |
|   | c.  | can divide a very limited number of times.​ |
|   | d.  | usually carry too many mutations to be practical in treating injury and illness.​ |

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| *ANSWER:* | a |

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| 117. ​Adult stem cells differ from embryonic stem cells in that adult stem cells

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|   | a.  | are more likely to provoke an immune response in the tissue recipient.​ |
|   | b.  | are less flexible and can only change into cells similar to their source.​ |
|   | c.  | ​can differentiate into more types of tissue. |
|   | d.  | are the subject of more intense ethical debate.​ |

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| *ANSWER:* | b |

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| 118. ​The “Common Rule” refers to

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|   | a.  | a set of ethical standards for research shared by 17 federal agencies.​ |
|   | b.  | laws limiting the use of university research facilities by private corporations.​ |
|   | c.  | Hippocrates' statement that physicians should “do no harm.”​ |
|   | d.  | ​federal restrictions on stem cell research. |

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| *ANSWER:* | a |

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| 119. ​University review boards

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|   | a.  | are composed of research faculty with expertise in the areas under study.​ |
|   | b.  | supervise the use of animals, but not humans, in research.​ |
|   | c.  | include a faculty member from a nonscience discipline.​ |
|   | d.  | ​supervise the use of humans, but not animals, in research. |

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| *ANSWER:* | c |

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| 120. ​Federal ethical guidelines apply to

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|   | a.  | research using humans, but not animals.​ |
|   | b.  | research conducted by faculty, but not by students.​ |
|   | c.  | projects and institutions receiving federal support only.​ |
|   | d.  | ​all research conducted in the United States. |

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| *ANSWER:* | c |

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| 121. ​As part of your senior thesis, you want to study the effects of advertising on young children during Saturday morning cartoons. Which of the following is the first step you will need to take?

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|   | a.  | ​Get informed consent from the group of children you will be using as subjects. |
|   | b.  | Obtain approval for your project from the human participants institutional review board at the university you are attending.​ |
|   | c.  | Recruit students from a local school to be subjects.​ |
|   | d.  | Find a place for all the children to watch television together on a Saturday morning.​ |

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| *ANSWER:* | b |

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| 122. ​Ethical standards for the use of human subjects require researchers to

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|   | a.  | never use deception.​ |
|   | b.  | ensure that participants understand that they can't quit once the experiment begins.​ |
|   | c.  | ​clearly identify each participant by name. |
|   | d.  | avoid coercion of participants.​ |

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| *ANSWER:* | d |

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| 123. ​A researcher wants to study fetal alcohol syndrome, a set of deficits in the offspring caused by maternal drinking during pregnancy, by randomly assigning pregnant mice to alcohol and no alcohol groups. Which of the following is the **best** reason for using mice instead of people for this study?

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|   | a.  | Although ethical standards for animal research still apply, some research considered completely unethical for humans can be conducted with animals.​ |
|   | b.  | You don't need to have the approval of an ethics committee in order to study mice.​ |
|   | c.  | Mice are so much like people there's no reason to study people.​ |
|   | d.  | ​Mice consume larger amounts of alcohol relative to their body weight than humans do. |

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| *ANSWER:* | a |

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| 124. ​Ethical standards for the use of animal subjects require researchers to

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|   | a.  | use only those techniques that do no permanent harm to their animals.​ |
|   | b.  | discuss their proposal with on-campus peers, but not necessarily with members of the community.​ |
|   | c.  | not use animals under any circumstances.​ |
|   | d.  | ​demonstrate the necessity of using animals in their project. |

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| *ANSWER:* | d |

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| 125. ​A group of scientists at your university wants to investigate rates of abuse of prescription drugs, like Oxycontin, among students living in dorms by using an online questionnaire. This research proposal is likely to raise ethical concerns about

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|   | a.  | maintaining student privacy.​ |
|   | b.  | ​obtaining truly informed consent. |
|   | c.  | All of the above.​ |
|   | d.  | informing participants about the nature of the study ahead of their involvement.​ |

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| *ANSWER:* | c |

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| **True / False** |

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| 126. Biological psychology can be defined as the branch of psychology that studies the biological foundations of behavior, emotions, and mental processes.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | True |

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| 127. ​Santiago Ramón y Cajal is best known for demonstrating that neurons generate electrical signals.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | False |

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| 128. The pathways of the brain can be studied using either myelin stains or horseradish peroxidase.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | True |

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| 129. Questions about the activity of the brain can be investigated using positron emission tomography (PET) and functional magnetic resonance imaging (fMRI).

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | True |

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| 130. ​Electroencephalograms (EEG) were first developed and used by Raymond Damadian in Germany in 1924.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | False |

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| 131. The use of repeated transcranial magnetic stimulation (rTMS) can be used to help treating those who suffer from auditory hallucinations associated with schizophrenia.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | True |

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| 132. ​Microdialysis can be used to assess the chemicals present in a very small area of the brain.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | True |

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| 133. If the concordance rate for a psychological disorder is 60 percent, this means that genetics determine 60 percent of a person’s risk and the environment contributes the other 40 percent.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | False |

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| 134. The only current source of stem cells is embryonic stem cells, which are usually at the blastocyst stage of development.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | False |

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| 135. ​Federal guidelines for using human participants in research apply to all organizations and individuals receiving federal funding.

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|   | a.  | True |
|   | b.  | False |

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| *ANSWER:* | True |

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| **Completion** |

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| 136. ​The image in the lower left of this figure combines information from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with information from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ imaging.

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| *ANSWER:* | magnetoencephalography (MEG), magnetic resonanceMEG, magnetic resonance   (see Figure 1.11) |

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| 137. ​In this illustration, a lesion is being produced in the rat’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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| *ANSWER:* | ​ventromedial hypothalamus (VMH) (see Figure 1.14) |

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| **Subjective Short Answer** |

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| 138. ​In what ways were the phrenologists right and in what other ways were they terribly wrong about the workings of the brain?

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| *ANSWER:* | Bumps on the head have nothing to do with the underlying activity of the brain, but phrenologists were correct in assuming that some functions were localized in the brain. |

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| 139. ​Why did it take so long for neuroscientists to accept the Neuron Doctrine?

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| *ANSWER:* | ​Neural tissue proved to be very difficult to observe using the light microscope. Neural tissue, even fixed, is transparent, and required the development of appropriate staining before it could be observed clearly. In addition, many neurons have very long processes that do not fit neatly in microscope slides, leading to the belief that the brain consisted of a vast interconnected network as opposed to single cells. |

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| 140. ​What makes it possible to assess activity levels using PET scans and fMRI?

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| *ANSWER:* | ​Busy neurons require more glucose and oxygen than neurons not currently involved in major processing. PET and fMRI are able to track the utilization of these substances by different parts of the brain. |

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| 141. ​What is one advantage of magnetoencephalography (MEG) over electroencephalography (EEG)?

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| *ANSWER:* | ​Because the skull bones block most of the electricity but little of the magnetism produced by the brain, the EEG gives only an approximation of brain activity compared to the accuracy and localization provided by MEG. |

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| 142. This figure illustrates one of the recording methodologies used in biological psychology. Briefly describe what each of the four images in this figure represents.1. (top-left) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2. (top-right) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_3. (bottom-left) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_4. (bottom-right) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| *ANSWER:* | ​(see labels of Figure 1.11) |

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| 143. ​Why must we be very careful about interpreting the results of lesion and stimulation experiments?

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| *ANSWER:* | ​In both lesion and stimulation experiments, we affect not only the target area of the brain, but any pathways traveling through the area of interest. Consequently, our lesions or stimulation might change behavior due to changes in the target area or in any other area with which the target area communicates. |

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| 144. ​Briefly (in 30 to 40 words) describe the lesion process depicted in this figure and its impact on the rat’s behavior.

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| *ANSWER:* | (see Figure 1.14)​ |

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| 145. ​Why is it sometimes necessary to use surgically implanted pipettes to deliver drugs to the brain directly?

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| *ANSWER:* | ​The brain, compared to many other organs, is unusually well protected. Many substances in the blood circulate through the brain without being able to exit into the neural tissue. |

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| 146. ​What does it mean to say when we say the heritability of a trait is 80 percent?

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| *ANSWER:* | Heritability is the amount that a trait varies in a population due to genetics. If the heritability of a trait is 80 percent, this means that 80 percent of the variability seen between two groups is likely to be due to genetics.​ |

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| 147. ​What are the strengths and weaknesses of adult stem cells relative to embryonic stem cells?

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| *ANSWER:* | ​Adult stem cells are less flexible (pluripotent) than embryonic cells and they lack the immortality of embryonic cells. However, when returned to their source organism, they do not provoke an immune response, whereas embryonic cells would do so. |

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| **Essay** |

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| 148. ​The history of biological psychology is in many ways the history of technical advances. Which three technological advances do you think were the most significant and why?

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| *ANSWER:* | ​Answer will vary |

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| 149. ​Adoptive families have been found to share many features in common. How is this likely to impact measures of trait heritability that compare children with their biological and adoptive parents and siblings?

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| *ANSWER:* | Answer will vary​ |

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| 150. ​Animal research continues to be very controversial. Describe the protections that are currently in place, and describe their strengths and weaknesses.

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| *ANSWER:* | Answer will vary​ |

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