Discovering Behavioral Neuroscience 5th edition Freberg Test Bank

SKU: 9780357798232-TEST-BANK

Name:_____ Class:_____ Date:_____

Ch 01 What is Behavioral Neuroscience?

1. Biological psychology can be defined as the branch of psychology that studies the biological foundations of behavior, emotions, and mental processes.
   a. True
   b. False

ANSWER: True

2. Santiago Ramón y Cajal is best known for demonstrating that neurons generate electrical signals.
   a. True
   b. False

ANSWER: False

3. The pathways of the brain can be studied using either myelin stains or horseradish peroxidase.
   a. True
   b. False

ANSWER: True

4. Questions about the activity of the brain can be investigated using positron emission tomography (PET) and functional magnetic resonance imaging (fMRI).
   a. True
   b. False

ANSWER: True

5. Electroencephalograms (EEGs) were first developed and used by Raymond Damadian in Germany in 1924.
   a. True
   b. False

ANSWER: False

6. Repeated transcranial magnetic stimulation (rTMS) can be used to help treat those who suffer from auditory hallucinations associated with schizophrenia.
   a. True
   b. False

ANSWER: True

7. Microdialysis can be used to assess the chemicals present in a very small area of the brain.
   a. True
   b. False

ANSWER: True

8. 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.
   a. True
   b. False

ANSWER: False

9. Stimulation of the brain using optogenetics is more precise than stimulation through surgically implanted electrodes.

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a. True
b. False

ANSWER: True

10. Federal guidelines for using human participants in research apply to all organizations and individuals receiving federal funding.
a. True
b. False

ANSWER: True

11. The fields of behavioral neuroscience and biological psychology
a. are unrelated to one another.
b. focus on different areas of the brain.
c. differ in the complexity of their respective levels of investigation.
d. are two different names for the same area of study.

ANSWER: d

12. Students planning to become mental health practitioners should learn about the biological basis of brain function so they will be able to
a. relate every psychological disorder to its source in the nervous system.
b. cope with major health and well-being challenges facing contemporary global populations.
c. prescribe appropriate medications for all clients.
d. understand all of neuroscience as a foundation for understanding clients.

ANSWER: b

13. 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?
a. She should see her doctor and perhaps even a neurologist to rule out any underlying physical problem.
b. She probably has some deep underlying resentment of her parents that she needs to recognize before she can get better.
c. The whole family should come in for therapy, as there is obviously something going on that is not obvious.
d. She should see a psychiatrist and get medication for the depression first and foremost; then talk therapy will probably help her.

ANSWER: a

14. Trepanation is a(n)
a. ancient practice of drilling holes in a person's skull.
b. type of mummification.
c. postmortem ritual.
d. technique involving the analysis of the bumps on the skull.

ANSWER: a

15. Scholars from what fourth century BCE civilization were the first to identify the brain as the source of sensation?

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a. the Egyptians
b. the Greeks
c. the Romans
d. the Chinese

ANSWER: b

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

ANSWER: b

17. The Egyptian author of the *Edwin Smith Surgical Papyrus* understood that
a. paralysis and lack of sensation in the body resulted from nervous system damage.
b. the brain is the source of every documented type of intelligence.
c. functions can be localized in the brain and the spinal cord, both of which comprise the central nervous system.
d. the brain is made up of trillions of separate cells.

ANSWER: a

18. The Egyptian author of the *Edwin Smith Surgical Papyrus* understood that
a. the ventricles are not the source of behavior.
b. epilepsy is a brain disturbance.
c. most nervous system damage is relatively permanent.
d. information about sensation and movement is carried by separate nerves.

ANSWER: c

19. Which of the following provide(s) evidence for early, accurate understanding of the function of the human brain?
a. phrenology
b. Egyptian mummification
c. the *Edwin Smith Surgical Papyrus* and the writings of Hippocrates
d. trepanation and the writings of Aristotle

ANSWER: c

20. Who correctly identified epilepsy as originating in the brain?
a. Galen
b. Aristotle
c. Herophilus
d. Hippocrates

ANSWER: d

21. Which of the following thinkers believed that the ventricles played an important role in transmitting information to and from the brain?
a. Aristotle

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b. Galen
c. Magendie
d. Herophilus

ANSWER: b

22. What mistaken notion about the nervous system persisted from ancient times up through the work of some Renaissance thinkers?
a. The ventricles play a major role in the transmission of messages in the brain.
b. The heart is the organ of intellect.
c. Damage to the brain is easily repaired.
d. The muscular tremors that characterize epilepsy do not originate in the brain.

ANSWER: a

23. Monism is the philosophical view that considers
a. the mind to be the product of activity in the brain.
b. mind and body to be separate entities.
c. the senses to be the source of knowledge.
d. reality to exist when it enters the thoughts of an observer.

ANSWER: a

24. Which one of the following conclusions regarding animal experimentation was implied by Rene Descartes's theory of mind–body dualism?
a. Much could be learned from animal experimentation, as both humans and animals had minds.
b. Animal experimentation was acceptable, as only humans possessed "minds."
c. Animal experimentation had to be avoided out of respect for the animal "mind."
d. Ethical guidelines for the use of animals in research were necessary because of the recognition of animal "minds."

ANSWER: b

25. Rene Descartes was a dualist, believing the mind and body are separate entities. Which of the following statements reflects this belief?
a. The mind is the product of neural activity.
b. The mind exists in both human and nonhuman animals.
c. The mind forms an indivisible whole with the body.
d. The mind is not a physical entity that can be studied.

ANSWER: d

26. Descartes's mind–body dualism is defined as the philosophical view that assumes
a. the mind gives rise to neural activity.
b. mind and body are separate entities.
c. reality exists only when perceived by an observer.
d. the five senses are the source of all knowledge.

ANSWER: b

27. Your roommate's personality has changed a great deal since an accident injured her prefrontal cortex. This fact

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supports what view of the mind–body connection?

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

ANSWER: b

28. Anton van Leeuwenhoek advanced brain science by

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

ANSWER: c

29. Who demonstrated that communication in the nervous system is electrical?

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

ANSWER: b

30. The Neuron Doctrine asserts that

a. neurons use electricity to communicate.
b. language is localized to the left hemisphere.
c. separate pathways are used for processing sensory and motor information.
d. the nervous system is a collection of separate cells.

ANSWER: d

31. The Neuron Doctrine was proposed by

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

ANSWER: d

32. In 1906, Italian researcher Camillo Golgi and Spanish anatomist Santiago Ramón y Cajal shared a Nobel prize for their work on the human nervous system. Which of the following statements about their work is true?

a. They did their research separately but came to the same conclusion.
b. They had opposing views on the structure of the nervous system.
c. They did their research together but came to different conclusions.
d. They each resented having to share the Nobel prize with someone else.

ANSWER: b

33. We know today that Santiago Ramón y Cajal's Neuron Doctrine is accurate, but what theory competed with the

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Neuron Doctrine as recently as the early 1900s?

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

ANSWER: b

34. Gall and Spurzheim, who proposed phrenology theory, eventually realized they were wrong and proposed a more modern theory. What theory replaced phrenology for these two researchers?

a. The brain is the organ of the mind.
b. The mind is the organ of the brain.
c. The mind and the brain are organs of each other.
d. The mind and the brain are unrelated and exist independently of one another.

ANSWER: a

35. Gall and Spurzheim were responsible for

a. the Neuron Doctrine.
b. establishing the electrical nature of neural communication.
c. demonstrating that sensory and motor information use separate pathways.
d. proposing the "science" of phrenology.

ANSWER: d

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

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

ANSWER: d

37. You feel a mosquito on your thigh faster than you feel one on the bottom of your foot. Why?

a. You are instinctively more protective of your thigh than of the bottom of your foot.
b. You can see your thigh but not the bottom of your foot.
c. The signal from your foot has to travel further to reach the brain.
d. Your thigh is more sensitive than the bottom of your foot.

ANSWER: c

38. The localization of language functions in the brain was observed by

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

ANSWER: a

39. Experiments in which the cortices of rabbits and dogs were stimulated electrically demonstrated that

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a. cortical inhibition can cause an individual to initiate a fight.
b. the nervous system has a hierarchical organization.
c. each side of the brain controls the opposite side of the body.
d. rabbits and dogs have minds.

ANSWER: c

40. The work of which researcher(s) provided further evidence for the localization of some functions in the brain?
a. LeDoux
b. Descartes
c. Fritsch and Hitzig
d. Bell and Magendie

ANSWER: c

41. Dr. Jones argues that higher levels of the brain inhibit aggressive impulses originating in lower levels of the brain. It is likely that her thinking has been influenced by the work of
a. Santiago Ramón y Cajal.
b. John Hughlings Jackson.
c. Franz Josef Gall.
d. Luigi Galvani.

ANSWER: b

42. John Hughlings Jackson is best known for
a. demonstrating the localization of language in the brain.
b. the Neuron Doctrine.
c. mind–body dualism.
d. viewing the nervous system as a hierarchy.

ANSWER: d

43. Charles Sherrington coined the term *synapse*, which refers to
a. the separation of brain and mind.
b. localization of activity within the brain.
c. the hierarchical construction of the nervous system.
d. the point of communication between two neurons.

ANSWER: a

44. "Fixing" brain tissue to be viewed refers to
a. slicing tissue into thin slices.
b. preserving the tissue by freezing or by the use of formalin.
c. mounting tissue on slides.
d. deciding which tissue to observe.

ANSWER: b

45. The existence of chemical signaling at the synapse was first demonstrated by
a. Charles Sherrington.

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b. Santiago Ramón y Cajal.
c. John Hughlings Jackson.
d. Otto Loewi.

ANSWER: d

46. Your physician tells you that a medical procedure you need is non-invasive. What does that term tell you about the procedure?
a. It could be fatal.
b. It will do significant harm to your body.
c. It will do minimal harm to your body.
d. It will do no harm to your body.

ANSWER: d

47. The modern technique of electron microscopy can display images at between 1 and 100 nanometers. A nanometer is one billionth of a meter. That means these methods are about how many times more powerful than the naked eye?
a. one hundred
b. one thousand
c. one million
d. ten million

ANSWER: c

48. If you want to observe a small number of cells in detail, it would be best to use the
a. Golgi silver stain.
b. Nissl stain.
c. myelin stain.
d. horseradish peroxidase stain.

ANSWER: a

49. If you want to identify clusters of cell bodies in a sample of tissue, it would be best to use the
a. Golgi silver stain.
b. Nissl stain.
c. myelin stain.
d. horseradish peroxidase stain.

ANSWER: b

50. To follow the pathways carrying information from one part of the brain to another, it would be best to use the
a. Golgi silver stain.
b. Nissl stain.
c. myelin stain.
d. antibody stain.

ANSWER: c

51. In the process known as immunohistochemistry, particular proteins in cells can be identified using

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

ANSWER: d

52. If you want to locate a pathway's point of origin, you should use
a. the Golgi silver stain.
b. the Nissl stain.
c. the myelin stain.
d. horseradish peroxidase.

ANSWER: d

53. 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. Inject horseradish peroxidase into a rat's amygdala and then see if cells in the orbitofrontal cortex are stained.
b. 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.
c. Look at a human brain with fMRI to see if the orbitofrontal cortex and amygdala are active at the same times.
d. Stimulate the orbitofrontal cortex of a human volunteer during neurosurgery.

ANSWER: a

54. Electron microscopes are capable of magnifications up to how many times?
a. 1,000
b. 100,000
c. 1 million
d. 10 million

ANSWER: c

55. What is the main problem with the earlier microscopy methods described in this chapter?
a. They cannot be used on living organisms.
b. They can resolve images only at the level of the nanoscopic scale.
c. They cannot magnify an image more than 100 times.
d. They always blur enlarged images.

ANSWER: a

56. T Synapses may be viewed using
a. optogenetics.
b. a light or electron microscope.
c. the naked eye.
d. a PET scanner.

ANSWER: b

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Ch 01 What is Behavioral Neuroscience?

57. What imaging process, commonly considered the "gold standard" imaging method, has been criticized for its high cost and low reproducibility?
    a. CT
    b. PET
    c. MRI
    d. fMRI

ANSWER: d

58. If you were told you needed a CT scan, what would be a reasonable concern?
    a. the exceptionally high cost
    b. amount of time needed to complete the process
    c. exposure to x-rays
    d. use of the oldest brain imaging technology

ANSWER: c

59. CT technology provided the first high-resolution look at
    a. the process of neuronal communication.
    b. parts of the brain smaller than a synapse.
    c. the living brain.
    d. activity in the brain.

ANSWER: c

60. What did positron emission tomography (PET) scans reveal for the first time?
    a. brain activity
    b. brain structure
    c. brain structures smaller than a synapse
    d. the point of origin of a brain pathway

ANSWER: a

61. PET scans
    a. expose the participant to x-rays.
    b. expose the participant to strong magnets.
    c. utilize detectors of radioactive tracers.
    d. require the participant to wear a head device containing sensors.

ANSWER: c

62. Single photon emission computed tomography (SPECT) is an imaging procedure closely related to PET. How does it differ from PET?
    a. It takes less time.
    b. It uses more radiation.
    c. It is more expensive.
    d. It provides less detail.

ANSWER: d

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63. If a researcher wanted to learn as much as possible about the structure and function of the human brain, what imaging procedure should they use?

a. MRI
b. fMRI
c. CT
d. PET

ANSWER: b

64. How does magnetic resonance imaging (MRI) make use of the fact that different types of brain tissue consist of different components?

a. The same components behave differently when exposed to greater or lesser amounts of magnetism.
b. It takes more pictures of components containing protein and carbohydrates.
c. Different components behave differently when exposed to MRI.
d. It ignores components not made of certain types of brain tissue.

ANSWER: c

65. Which one of these statements important to magnetic resonance imaging (MRI) is true?

a. Nerve fibers ("white matter") are covered by salt water.
b. Tissue made up of nerve cell bodies ("gray matter") contains large amounts of protein and carbohydrates.
c. The material surrounding brain cells contains a large amount of fat.
d. All brain tissue contains protein and carbohydrates, water, and fat.

ANSWER: b

66. In MRI technology, each small area being observed in the brain is assigned a voxel. What is a voxel?

a. a three-dimensional image of all the pixels in the area
b. a two-dimensional image of all the pixels in the area
c. a three-dimensional image of a single pixel
d. a two-dimensional image of a single pixel

ANSWER: c

67. Which statement describes the Blood Oxygenation Level Dependent (BOLD) effect in fMRI imaging?

a. Blood flow in the brain is increased or decreased depending on the level of oxygen in the blood.
b. The injection of radioactive substances into the participant causes oxygen levels to increase throughout the brain.
c. Voxels show no changes in activity connected to movement and stimulation, even though firing neurons require more oxygen.
d. Signals from a voxel change in relation to the level of oxygen in the area.

ANSWER: d

68. In MRI technologies, the term *voxel* refers to

a. the rate at which atoms spin.
b. the strength of the magnets used.
c. a small area of tissue assigned a 3D version of a pixel.
d. a gamma ray released during the breakdown of a radioactive tracer.

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ANSWER: c

69. Functional magnetic resonance imaging (fMRI) takes advantage of the fact that compared with less active neurons, more active neurons require greater amounts of
a. hydrogen.
b. oxygen.
c. gamma radiation.
d. magnetism.

ANSWER: b

70. Which of the following contemporary technologies was previewed by and impressed nineteenth century psychologist William James?
a. PET
b. CT
c. electroencephalography (EEG)
d. fMRI

ANSWER: d

71. Hemoglobin's magnetic properties change when it is
a. combined with oxygen.
b. combined with glucose.
c. bombarded with gamma rays.
d. exposed to x-rays.

ANSWER: a

72. The BOLD effect is important in which of the following technologies?
a. PET
b. CT
c. electroencephalography (EEG)
d. fMRI

ANSWER: d

73. Compared with PET scans, fMRI provides
a. more information about brain activity.
b. better structural resolution.
c. fewer side effects.
d. more economical imaging.

ANSWER: a

74. 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?
a. Inject the patient with horseradish peroxidase.
b. Do a CT scan on the brain.

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c. Do an fMRI scan.
d. Stimulate the patient's brain during neurosurgery.

ANSWER: c

75. Social psychologist 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?
a. MRI
b. CT
c. electroencephalography (EEG)
d. fMRI

ANSWER: d

76. The first EEG recordings were made by
a. Phelps and Hoffman.
b. Wilhelm Röntgen.
c. Hans Berger.
d. Hounsfield and Cormack.

ANSWER: c

77. Traditionally, electroencephalography (EEG) is most commonly used to study
a. emotion.
b. psychopathology.
c. states of consciousness and epilepsy.
d. learning and memory.

ANSWER: c

78. What does the recording of event-related potentials (ERPs) allow researchers to do?
a. identify the neurochemicals active in particular parts of the brain
b. generate high resolution images of brain structures
c. correlate the timing of cortical neuron activity with stimuli presented to the participant
d. track the utilization of glucose and oxygen by the brain

ANSWER: c

79. What technique was used to identify mirror neurons (neurons that fire in response to viewing an action performed by someone else, such as the experimenter or even a monkey)?
a. PET
b. single-cell recording
c. electroencephalography (EEG)
d. ERPs

ANSWER: b

80. Researchers now know that even minimal exposure to alcohol in the womb can negatively impact the neural networks of a child. What procedure provided this information?

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a. PET
b. diffusion tensor imaging (DTI)
c. fMRI
d. repeated rTMS

ANSWER: b

81. Jeremy's physician suspects that he might have epilepsy. Which of the following technologies would be helpful in making a diagnosis?
a. PET
b. CT
c. EEG brain tomography
d. fMRI

ANSWER: c

82. What is the advantage of recording the brain's magnetism rather than its electrical activity?
a. Recording magnetism costs less than recording electrical activity.
b. Recording electrical activity is a lengthy procedure, and recording magnetism is not.
c. Skull bones and tissues do not reduce magnetism as it passes through.
d. Magnetism produces more information than electrical activity does.

ANSWER: d

83. What exactly is recorded in studies of brain magnetism (magnetoencephalography)?
a. the magnetic fields of active neurons
b. the magnetic field of the cerebral cortex
c. magnetic particles deep within the brain's tissue
d. the magnetic field of the entire brain

ANSWER: a

84. Dr. Scheinhorn is interested in studying the magnetic activity involved in speech sounds. What recording device would you recommend to him?
a. MEG
b. PET
c. CT
d. fMRI

ANSWER: a

85. MEG involves the recording of
a. the magnetic output only at the shallowest levels of the brain.
b. electrical activity from the brain during surgery.
c. the magnetic output of nerve cells.
d. electrical activity from the brain through electrodes placed on the scalp.

ANSWER: c

86. The skull bones and other tissues separating the brain from electrodes can create a problem for recording because they

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block

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

ANSWER: a

87. MEG recordings may be taken

a. at the same rate as PET and fMRI scans.
b. faster than PET, but more slowly than fMRI scans.
c. faster than fMRI, but more slowly than PET scans.
d. faster than both PET and fMRI scans.

ANSWER: d

88. Why is MEG more useful than fMRI for studying participants' responses to sounds?

a. MEG equipment is much cheaper and easier to use than fMRI equipment.
b. The magnets used in fMRI are noisy, blocking a patient's ability to sense quiet sounds.
c. MEG recordings of brain activity must be taken more slowly than fMRI images, allowing a more accurate assessment of brain activity.
d. MEG recordings expose the patient to x-rays.

ANSWER: b

89. Researchers superimpose MEG recordings on three-dimensional MRI images because MEG recordings

a. do not provide any anatomical data.
b. have no meaning by themselves.
c. provide only vague anatomical images.
d. are needed to enhance MRI.

ANSWER: a

90. Superconducting quantum interference device (SQUID) sensors are used in

a. PET scans.
b. fMRI.
c. MEG.
d. EEG.

ANSWER: c

91. MEG results are usually superimposed on images obtained by

a. CT scans.
b. PET scans.
c. MRI.
d. EEG.

ANSWER: c

92. What improvement in MEG will likely contribute to our understanding of brain correlates of behavior?

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a. the ability to assess activity of single neurons
b. the production of three-dimensional images
c. the development of a mobile recording device
d. the ability to record anatomical data

ANSWER: c

93. Which technology requires the surgical placement of a microelectrode outside of a cell?
a. EEG
b. MRI
c. intracellular recordings
d. single-cell recordings

ANSWER: d

94. In a single-cell recording, electrode tips
a. contained in SQUIDs must be positioned over the area of interest.
b. must be positioned on the surface of the skull bones.
c. must be surgically implanted.
d. must be arrayed on the surface of the scalp.

ANSWER: c

95. The purpose of stimulation research is to
a. identify stimuli that activate a particular part of the brain.
b. identify the function of a specific part of the brain.
c. observe individual ion channels in the membranes of neurons.
d. observe the activity of a particular part of the brain.

ANSWER: b

96. It is necessary to exercise caution in interpreting the results of brain stimulation research because
a. different researchers may have different interpretations.
b. the participant may not report reactions honestly.
c. stimulation of one part of the brain can affect the areas to which it is connected.
d. brain stimulation is a relatively new field and we know little about it.

ANSWER: c

97. Why is it common practice to conduct neurosurgery under local anesthesia instead of general anesthesia?
a. 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.
b. General anesthesia has inherent risks not present with local anesthesia and should be avoided when possible.
c. The person undergoing a neurosurgical procedure may have serious anxiety and need to be able to converse with the surgeon during the procedure.
d. General anesthesia does not last as long as local anesthesia, so it is not suitable for lengthy procedures.

ANSWER: a

98. The Food and Drug Administration (FDA) has approved the use of repeated transcranial magnetic stimulation (rTMS)

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for

a. obsessive-compulsive disorder and major depressive disorder.
b. attention deficit hyperactivity disorder and autism.
c. autism and schizophrenia.
d. major depressive disorder and attention deficit hyperactivity disorder.

ANSWER: a

99. Eduardo has a serious addiction to nicotine. He has tried various programs and treatments, but he has been unable to stop smoking. Eduardo's physician might try which of the following treatments in order to provide him with relief from these troubling symptoms?

a. low frequency rTMS
b. lesions of the auditory cortex
c. electrical stimulation of the auditory cortex
d. gene therapy

ANSWER: a

100. What brain stimulation method has proven to be disappointing in efforts to improve cognitive function?

a. MEG
b. rTMS
c. fMRI
d. EEG

ANSWER: b

101. The genetic insertion of molecules into specific neurons that allows the activity of the neurons to be controlled by light is called

a. optogenetics.
b. epigenetics.
c. dialectical genome manipulation.
d. MEG.

ANSWER: a

102. The analysis of lesions allows researchers to

a. identify stimuli that activate a particular part of the brain.
b. identify the probable 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.

ANSWER: b

103. Naturally occurring lesions identified after an autopsy were interpreted by

a. Paul Broca.
b. Simon LeVay.
c. Hounsfield and Cormack.
d. Fritsch and Hitzig.

ANSWER: a

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104. Small lesions can be produced by applying neurotoxins, which are chemicals that
   a. strengthen neurons.
   b. kill neurons.
   c. cause neurons to shrink.
   d. slightly injure neurons.

ANSWER: b

105. Animals will gain up to two to three times their normal weight when the
   a. lateral hypothalamus is lesioned.
   b. lateral hypothalamus is stimulated.
   c. ventromedial hypothalamus is lesioned.
   d. ventromedial hypothalamus is stimulated.

ANSWER: c

106. 

The purpose of conducting research using the technique illustrated in this figure is to
   a. discover the boundaries of the target area of the brain.
   b. identify the chemicals present in 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.

ANSWER: c

107. When a large area of brain is surgically removed, we might refer to the result as a(n)
   a. magnetoencephalogram.
   b. microdialysis analysis.
   c. lesion.
   d. ablation.

ANSWER: d

108. What do both heat-produced and chemically produced lesions result in?
   a. altered states of consciousness
   b. sensations of heat or cold in the brain
   c. permanent damage to the brain
   d. temporary damage to the brain

ANSWER: c

109. Reversible lesions are produced by applying
   a. heat.

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b. cold.
c. chemicals.
d. heat or cold.

ANSWER: b

110. Both lesions and electrical brain stimulation allow scientists to
a. observe the activity of a particular part of the brain.
b. observe the biochemical environment in a particular area of the brain.
c. observe the functions of particular parts of the brain.
d. identify stimuli that normally activate a particular part of the brain.

ANSWER: c

111. Dr. Abboud is interested in whether individuals on the autism spectrum have malfunctioning mirror neurons. Which of the following technologies would you recommend to Dr. Wilson for answering this question?
a. rTMS
b. fMRI
c. single cell recording
d. lesioning and electrical brain stimulation

ANSWER: c

112. Most chemicals in the blood supply
a. enter the brain more easily than they enter other organs.
b. are less likely to enter the brain than to enter other organs.
c. enter the brain as easily as they enter other organs.
d. are unable to enter the brain or other organs.

ANSWER: b

113. Researchers are turning away from microdialysis on humans and seeking other ways to identify areas in which a specific neurochemical is particularly active, because microdialysis
a. is a risky procedure.
b. takes a long time to complete.
c. often fails.
d. is too invasive.

ANSWER: d

114. Researchers interested in the effects of a drug on a subject are most likely to
a. surgically implant micropipettes to administer precise amounts of the drug to the brain.
b. use microdialysis.
c. allow the subject to inhale, eat, or chew substances that contain precise amounts of the drug.
d. sample the chemicals that are active in a precise location in the brain.

ANSWER: a

115. One of the challenges associated with the successful use of chemotherapy for treating brain tumors is the fact that
a. no known chemotherapy agents are effective against the types of tumors that arise in the brain.

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b. no chemicals are ever able to pass from the blood supply to the brain.
c. many circulating chemicals are not able to enter the brain.
d. chemicals introduced to the brain do not pass through neural membranes.

ANSWER: c

116. Microdialysis is used to
a. assess the chemicals present in a very small area of the brain.
b. apply chemicals directly to the brain.
c. produce lesions.
d. identify the function of a small area of the brain.

ANSWER: a

117. Dizygotic (fraternal) twins typically have roughly what percentage of their genes in common?
a. 25
b. 50
c. 75
d. 100

ANSWER: b

118. Monozygotic (identical) twins typically have roughly what percentage of their genes in common?
a. 25
b. 50
c. 75
d. 100

ANSWER: d

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

ANSWER: b

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

ANSWER: b

121. If the concordance rate for alcoholism were 50 percent among identical twins, which of the following would be true?
a. If you inherit the gene that encodes alcoholism, you will develop alcoholism.
b. If there is no alcoholism in your family, you will never develop a problem with alcoholism.

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c. If your father suffers from alcoholism, you will not develop the problem as long as he is not involved in raising you.
d. 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.

ANSWER: d

122. If a trait were primarily influenced by genetic variables, we would expect to see
a. adopted children who are more similar to their biological parents in the trait than to their adoptive parents.
b. adopted children who are more similar to their adoptive parents in the trait than to their biological parents.
c. strong similarities between adoptive and biological parents.
d. strong similarities between adoptive children and their adoptive siblings.

ANSWER: a

123. What is the BEST definition of heritability?
a. the amount of an individual's phenotype that is due to genetic influences
b. the proportion of traits in an individual that is not influenced by environmental variables
c. the amount that a trait varies in a population that is due to genetics
d. the likelihood that a parent will pass on a particular trait to their offspring

ANSWER: c

124. 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. underestimation of genetic influences
d. magnification of genetic influences

ANSWER: d

125. Dr. Campos is studying variations of intelligence among children living in an 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's results by
a. exaggerating genetic influences on intelligence.
b. causing her to underestimate genetic influences on intelligence.
c. exaggerating environmental influences on intelligence.
d. exaggerating individual differences in intelligence.

ANSWER: a

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

ANSWER: b

127. Dr. Pratt is interested in identifying genes related to reduced eye contact in individuals with autism spectrum

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disorder. To identify the genes associated with this trait, Dr. Pratt will probably conduct a

a. knockout gene experiment.
b. twin study.
c. forward genetic screen.
d. reverse genetic screen.

ANSWER: c

128. A gene-wide association study (GWAS) is a type of

a. twin study.
b. adoption study.
c. reverse genetic screen.
d. forward genetic screen.

ANSWER: d

129. Optogenetics allows researchers to

a. visualize neurons with very high resolution.
b. influence the activity of neurons with light.
c. record the activity of individual neurons.
d. lesion individual neurons using light.

ANSWER: b

130. The "Common Rule" refers to

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

ANSWER: c

131. University institutional review boards (IRBs) evaluate compliance with ethical standards in

a. all types of research.
b. research on human beings.
c. animal research only.
d. human and animal research.

ANSWER: d

132. Federal ethical guidelines apply to

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

ANSWER: b

133. 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 institutional review board (IRB) 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.

ANSWER: b

134. Ethical standards for the use of human subjects require researchers to
a. clearly identify each participant by name.
b. never use deception.
c. avoid coercion of participants.
d. ensure that participants understand that they cannot quit once the experiment begins.

ANSWER: c

135. 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?
a. Mice consume larger amounts of alcohol relative to their body weight than humans do.
b. Approval of an ethics committee is not required in order to study mice.
c. Some research considered unethical for humans can be conducted with animals.
d. Mice are so much like people that they can serve as reasonable substitutes in studies of physical behaviors.

ANSWER: c

136. In addition to adhering to specific ethical standards when using animals for research, what else are researchers required to do?
a. Decondition the animals when the experiment is complete.
b. Try to replace human studies with animal studies to the greatest degree possible.
c. Train the animals before using them in research.
d. Provide excellent care and housing for the animals.

ANSWER: d

137. A group of scientists at your university wants to investigate rates of misuse of prescription drugs, like Oxycontin, among students living in dorms. They plan to use an online questionnaire. This research proposal is likely to raise ethical concerns about
a. obtaining truly informed consent.
b. not working in person with research participants.
c. whether or not all the participants are at least 18 years of age.
d. giving participants the impression that people in their situation misuse prescription drugs.

ANSWER: d

138. The majority of animals used in research in the United States are
a. guinea pigs.
b. rats and mice.
c. chimpanzees.
d. cats and dogs.

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ANSWER: b

139. What is the primary purpose of open science initiatives?
ANSWER: to encourage the sharing of research results, methods, or resources

140. Why do universities have Institutional Review Boards?
ANSWER: to evaluate the ethics of planned research on human beings

141. Phrenologists like Gall believed that the shape of bumps on the skull indicated differences in the function of the brain under that skull. Although this theory has been discredited, there is evidence that the impact to the skull and the resulting trauma of a concussion produces measurable changes in the brain. Explain whether this fact vindicates phrenology as a means to study brain dysfunction.
ANSWER: Answers will address that Gall claimed the shape of the skull indicated brain functions, but impacts to the skull were not the basis for his work. Rather, an impact to the skull that produces a concussion is producing trauma in the soft tissue of the brain, not altering the bony skull. Phrenology was about hard shapes indicating function, trauma is about soft tissue being damaged and resulting in modifying function.

142. Your textbook emphasizes that biology and behavior form a reciprocal relationship. We are often aware of situations in which our biology affects our behavior, such as when we take a medication and notice its results. We are somewhat less aware of situations in which our behavior affects our biology. One such situation was the Covid-19 pandemic, in which we used a variety of behaviors to reduce our chances of getting the disease. Relate the preventive measures taken during the pandemic to the ability of our behavior to influence important biological functions.
ANSWER: Typical answers will discuss the fact that biology can impact all of our behaviors, including our actions, thoughts, and emotions. The response should include the fact that social isolation resulting from preventive measures during the Covid-19 pandemic led to various levels of loneliness, depending on how people perceived their isolation. Increased feelings of loneliness reduced the immune system's ability to fight the virus. Recognizing the effects of behavior on biology is important for understanding key concepts such as the efficacy of cognitive-behavioral therapy for treating depression and placebo effects.

143. Brain surgery on a human patient is often accomplished with local anesthetic instead of general. Recognizing that the first principle in medicine is to do no harm, give reason as to why it is ethical and often preferred to have the patient awake during brain surgery.
ANSWER: Local anesthetic is sufficient to eliminate the pain from the surgery, and because there are no pain receptors in the brain tissue itself there is no sense of pain from the procedure. There is an advantage in having a patient awake for certain brain surgeries to provide the surgeon with additional feedback as to function of specific regions, as a patient can indicate any sensation triggered by mild stimulation of a region. This can allow a surgeon operating to have the security of knowing that a minimal amount of damage may be done. Thus, the absence of pain receptors in the brain indicates no harm will come (the ethical component) and the potential feedback gives possible improvement of the procedure (the advantage to this method).

144. 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?
ANSWER: Students may choose from several advances. Some likely choices are the brain imaging techniques (MRI, fMRI, PET scan), electrical recordings/stimulations (single unit recording, deep brain stimulation, etc.), drugs for therapies (like SSRIs, opioids and naloxone, etc.). Reasons for choosing each technological advance will vary but are likely to include the accessibility of previously inaccessible information and the consequences for biological psychology.

145. Adoptive families have been found to share many features in common. How is this likely to impact measures of trait

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heritability that compare children with their biological and adoptive parents and siblings?

ANSWER: One challenge in comparing biological and adoptive families is the lack of randomness in adoptive parents. Parents who choose to adopt may share common features, which would presumably skew the analyses of comparisons of the biological and environmental impacts on traits.

146. Animal research continues to be controversial. Describe the protections that are currently in place and their strengths and weaknesses.

ANSWER: Students should be aware in their answers of animal care and use committees, and the protections that are in place for protection of animals (and human subjects) from harm. They should discuss what an IRB is and how it works, discuss animal care and use guidelines and what role these play. It is likely that they will also include some comparison of animals used in research and animals used in other settings (testing of cosmetics, for example) and distinguish rationales for each.

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