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Name:_____ Class:_____ Date:_____

Chapter 01

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

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9. Stimulation of the brain using optogenetics is more precise than stimulation through surgically implanted electrodes.
   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. Biological psychology is best defined as the
   a. study of the mind.
   b. science of brain and behavior.
   c. study of behavior and mental processes.
   d. branch of psychology that studies the biological foundations of behavior, emotions, and mental processes.

ANSWER: d

12. It is important for students of psychology to learn about the biological basis of brain function to be a counselor because it allows them to
   a. be able to diagnose mental illness in public settings.
   b. be able to recognize a neurological condition underlying psychological symptoms in a client.
   c. be able to prescribe medications correctly for your clients.
   d. have clear knowledge about all of neuroscience.

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 for a complete physical and perhaps even see a neurologist to rule out any underlying physical problem.
   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. The whole family should come in for therapy, as there is obviously something going on somewhere that is not obvious.
   d. She should see a psychiatrist and get medication for the depression first and foremost, then talk therapy will probably be able to help her.

ANSWER: a

14. Trepanation is a(an)
   a. ancient practice of drilling holes in a person's skull.

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b. type of mummification.
c. postmortem ritual.
d. technique involving the analysis of the bumps on the skull.

ANSWER: a

15. During the process of mummification, early Egyptians discarded the
a. heart.
b. brain.
c. lungs.
d. stomach.

ANSWER: b

16. The process of trepanation
a. always killed the patient.
b. may have been done to release demons or relieve feelings of 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?

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

ANSWER: a

24. Which of the following outcomes were among the implications of Rene Descartes's mind-body dualism?
a. Increased animal experimentation due to the belief that humans and animals had much in common.
b. Animal experimentation that appears cruel by modern standards, due to the belief that only humans possessed "mind."
c. Avoidance of animal experimentation due to respect for the animal "mind."
d. Improvements in ethical guidelines for the use of animals in research due to the recognition of animal "minds."

ANSWER: b

25. Rene Descartes was a dualist, believing the mind and body are different entities. Which of the following statements is true regarding his understanding?
a. The mind is the product of neural activity.
b. The mind exists in both human and nonhuman animals.

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

ANSWER: b

27. 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.
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. _____ demonstrated that communication in the nervous system is accomplished electrically.
a. Descartes
b. Galvani and du Bois-Reymond
c. Golgi and Cajal
d. van Leeuwenhoek

ANSWER: b

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

ANSWER: d

31. The Neuron Doctrine was proposed by

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

ANSWER: d

32. Which of the following made the Neuron Doctrine possible?
a. the light microscope and the use of stains in histology
b. the ability to apply electricity through wires
c. fewer restrictions on animal research
d. fewer restrictions on human dissection

ANSWER: a

33. 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?
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. The microscope was invented by
a. Anton van Leeuwenhoek.
b. Camillo Golgi.
c. Santiago Ramón y Cajal.
d. Vernon Mountcastle.

ANSWER: a

35. Gall and Spurzheim are responsible for
a. the Neuron Doctrine.
b. establishing the electrical nature of neural communication.
c. demonstrating that sensory and motor information uses 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

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37. Localization of function in the brain became established in large part due to the work of
    a. Descartes.
    b. Santiago Ramón y Cajal.
    c. Broca, Fritsch, and Hitzig.
    d. Hughlings Jackson.

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

ANSWER: c

40. The work of Fritsch and Hitzig provided further evidence for the
    a. Neuron Doctrine.
    b. accuracy phenomenon.
    c. localization of some functions in the brain.
    d. Bell-Magendie law.

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 Dr. Jones has been most directly influenced in her thinking 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.

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d. viewing the nervous system as a hierarchy.

ANSWER: d

43. The term *synapse*, meaning the point of communication between two neurons, was first used by
a. Charles Sherrington.
b. Santiago Ramón y Cajal.
c. John Hughlings Jackson.
d. Otto Loewi.

ANSWER: a

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

ANSWER: d

46. The study of microscopic structures and tissues is known as
a. histology.
b. phrenology.
c. staining.
d. imaging.

ANSWER: a

47. A microtome is a
a. stain.
b. fixative.
c. machine used to slice tissue.
d. type of microscope.

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.

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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. Particular proteins in cells can be identified using _____ in a process known as immunohistochemistry.
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, it would be best to 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

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

ANSWER: c

55. Examination of a body after death is known as
    a. autopsy.
    b. phrenology.
    c. microdialysis.
    d. optogenetics.

ANSWER: a

56. Structures at the synapse may be viewed with
    a. optogenetics.
    b. a light or electron microscope.
    c. the naked eye.
    d. a CT scanner.

ANSWER: b

57. In his study of the biology of sexual orientation, Simon LeVay (1991) used the method of
    a. phrenology.
    b. histology.
    c. CT scanning.
    d. fMRI.

ANSWER: b

58. CT scanning is based on
    a. the gamma camera.
    b. histology.
    c. x-ray technology.
    d. magnetism.

ANSWER: c

59. Modern CT images differ from earlier versions in that they
    a. no longer use x-rays.
    b. are safer for the participant as well as the x-ray technician.
    c. can be used to construct three-dimensional images.
    d. can be used to measure activity in a structure.

ANSWER: c

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60. PET scans were made possible by the development of
    a. the gamma camera.
    b. x-rays.
    c. powerful magnets.
    d. histology techniques.

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 helmet containing sensors.

ANSWER: c

62. In PET scans, colors are assigned that reflect the
    a. density of tissue in a particular area.
    b. response of the cells in a particular area to magnetism.
    c. magnetic output of an area of the brain.
    d. amount of activity in a particular area of the brain.

ANSWER: d

63. A red area in a PET scan typically indicates that the area is showing _____ activity.
    a. high
    b. moderate
    c. low
    d. no

ANSWER: a

64. Magnetic resonance imaging (MRI) technology is based on
    a. magnetism.
    b. radioactivity.
    c. x-rays.
    d. the gamma camera.

ANSWER: a

65. In MRI technology, powerful magnets are used to align
    a. oxygen atoms.
    b. hydrogen atoms.
    c. glucose molecules.
    d. water molecules.

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ANSWER: b

66. In MRI technology, the area of the body to be imaged is exposed to
    a. x-rays.
    b. radioactivity.
    c. radio frequency (RF) pulses.
    d. a gamma camera.

ANSWER: c

67. Functional magnetic resonance imaging (fMRI) requires
    a. stronger magnets than those used in MRI.
    b. the injection of radioactive substances into the participant.
    c. larger numbers of gamma cameras than in MRI.
    d. multiple images taken in a short period of time.

ANSWER: d

68. In MRI technologies, we use the term *voxel* to refer to
    a. the rate at which atoms spin.
    b. the strength of the magnets being used.
    c. a small area of tissue to be assigned a pixel of appropriate color or darkness.
    d. a gamma ray released during the breakdown of a radioactive tracer.

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 nineteenth century physiologist Angelo Mosso's work with patients who had head injuries?
    a. PET
    b. CT
    c. Electroencephalography (EEG)
    d. fMRI

ANSWER: d

71. Hemoglobin's magnetic properties change when it is
    a. combined with oxygen.

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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 and look at his brain during an autopsy.
b. Do a CT scan on the brain to see what area is not functioning.
c. Use fMRI to compare the activity of the brains of the patient and normal volunteers when they are presented with pictures of various tools.
d. During neurosurgery on the patient, stimulate his brain to see what part is not functioning.

ANSWER: c

75. 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.

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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. Quantitative analysis of modern electroencephalography (EEG) recordings can be used to
    a. construct 3-D maps of brain activity.
    b. generate high resolution images of brain structures.
    c. identify the neurochemicals active in particular parts of the brain.
    d. track the utilization of glucose and oxygen by the brain.

ANSWER: a

79. Joan has a seizure disorder. Her doctors are most likely to assess her progress using which of the following technologies?
    a. PET
    b. CT
    c. Electroencephalography (EEG)
    d. fMRI

ANSWER: c

80. Future law enforcement personnel might possibly be able to use which of the following technologies to assess whether a person is being truthful or not?
    a. PET
    b. magnetoencephalography (MEG)
    c. fMRI
    d. repeated rTMS

ANSWER: c

81. Jeremy's physician suspects that he might have attention deficit hyperactivity disorder. Which of the following technologies is the physician might be helpful in determining a diagnosis?
    a. PET
    b. CT
    c. EEG brain tomography
    d. fMRI

ANSWER: c

82. The analysis of evoked potentials is based on
    a. CT.

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b. PET.
c. fMRI.
d. Electroencephalography (EEG).

ANSWER: d

83. A technique that is often used to determine whether or not a stimulus has been perceived by the brain is
a. the analysis of evoked potentials.
b. the recording of electrical activity from the brain during surgery.
c. PET.
d. MRI.

ANSWER: a

84. 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. analysis of evoked potentials
b. PET
c. CT
d. fMRI

ANSWER: a

85. MEG involves the
a. analysis of evoked potentials.
b. recording of electrical activity from the brain during surgery.
c. recording of the magnetic output of the brain.
d. recording of 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 by blocking
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

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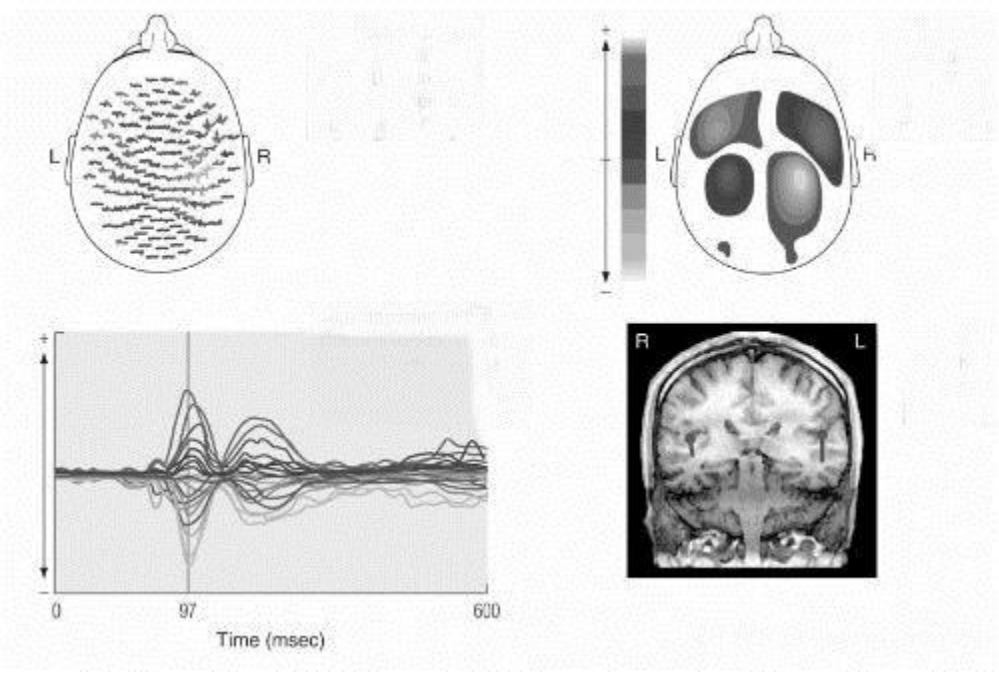
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88. Why is MEG more useful than fMRI for studying participants' responses to quiet sounds?
    a. MEG equipment is much cheaper and easier to use than fMRI equipment.
    b. The magnets used in fMRI are very noisy, blocking the ability to sense quiet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

ANSWER: b

89.



The technology illustrated in this figure allows researchers to
    a. research the magnetic output of the brain.
    b. research the electrical output of the brain.
    c. identify areas of the brain that have been lesioned.
    d. identify the effects of magnetic stimulation of the brain.

ANSWER: a

90. Superconducting quantum interference device (SQUID) sensors are used in
    a. PET scans.
    b. fMRI.
    c. MEG.
    d. electroencephalography.

ANSWER: c

91. MEG results are usually superimposed on images obtained by
    a. CT scans.

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b. PET scans.
c. MRI.
d. Electroencephalography (EEG).

ANSWER: c

92. Which of the following technologies are most useful in analyzing brain activity during a seizure?
a. CT
b. PET
c. MEG
d. MRI

ANSWER: c

93. In order to study the visual cortex of animals, Mountcastle, Hubel, and Wiesel used which of the following technologies?
a. Electroencephalography (EEG)
b. evoked potentials
c. MEG
d. single cell recordings

ANSWER: d

94. In order to do 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 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. Wilder Penfield and Robert Heath used which of the following techniques with their human participants?
a. patch clamps
b. MEG
c. electrical stimulation
d. single cell recording

ANSWER: c

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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 is more expensive, so this is a good way to save money on medical care.
   c. The person undergoing a neurosurgical procedure is unable to tell which type of anesthesia is being used.
   d. General anesthesia does not last as long as local anesthesia, so is not suitable for lengthy procedures.

ANSWER: a

98. Repeated rTMS appears to be a promising treatment for which of the following psychological disorders?
   a. schizophrenia and depression
   b. attention deficit hyperactivity disorder and autism
   c. autism and schizophrenia
   d. depression and attention deficit hyperactivity disorder

ANSWER: a

99. 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 experimental treatments in order to provide him with relief from these troubling symptoms?
   a. repeated rTMS
   b. lesions of the auditory cortex
   c. electrical stimulation of the auditory cortex
   d. gene therapy

ANSWER: a

100. 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. MEG
   b. repeated rTMS
   c. fMRI
   d. Electroencephalography (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.

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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

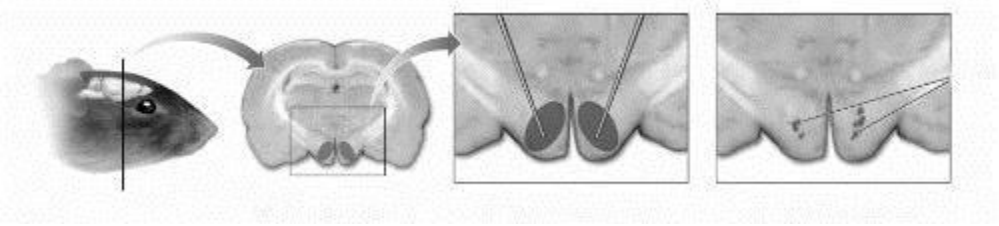
104. The use of experimentally induced lesions in animals was introduced by
a. Paul Broca.
b. Pierre Flourens.
c. Camillo Golgi.
d. Galvani.

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 refer to the result as a(n)
a. magnetoencephalogram.

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b. microdialysis analysis.
c. lesion.
d. ablation.

ANSWER: d

108. Permanent lesions are usually produced by applying
a. cold or chemicals.
b. heat or cold.
c. heat or chemicals.
d. magnetism or cold.

ANSWER: c

109. Reversible lesions are produced by applying
a. heat.
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. 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. repeated rTMS
b. fMRI
c. single cell recording
d. lesioning and electrical brain stimulation

ANSWER: d

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

ANSWER: b

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

ANSWER: d

114. Researchers interested in the effects of a drug on an awake, freely moving animal are most likely to
   a. use surgically implanted micropipettes to administer precise amounts of the drug directly to the brain.
   b. use microdialysis.
   c. allow the animal 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.
   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. Fraternal twins typically have about _____ percent of their genes in common.
   a. 25
   b. 50
   c. 75
   d. 100

ANSWER: b

118. Identical twins typically have about _____ percent of their genes in common.
   a. 25
   b. 50
   c. 75
   d. 100

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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, his or her 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 his or her 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.
   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 his or her offspring

ANSWER: c

124. The similarities that are often seen among families that adopt children might have which of the following effects on

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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 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'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 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.

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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 shared by 17 federal agencies.
d. Hippocrates' statement that physicians should "do no harm."

ANSWER: c

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

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?
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.

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 can't 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

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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. You don't need to have the approval of an ethics committee in order to study mice.
c. Although ethical standards for animal research still apply, some research considered completely unethical for humans can be conducted with animals.
d. Mice are so much like people that there's no reason to study people.

ANSWER: c

136. Ethical standards for the use of animal subjects require researchers to

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

ANSWER: a

137. 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

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

ANSWER: d

138. The ethical standard of doing no harm in medical work originated with the writings of

a. Galen.
b. Hippocrates.
c. Descartes.
d. the U.S. Common Rule standards for protecting research participants.

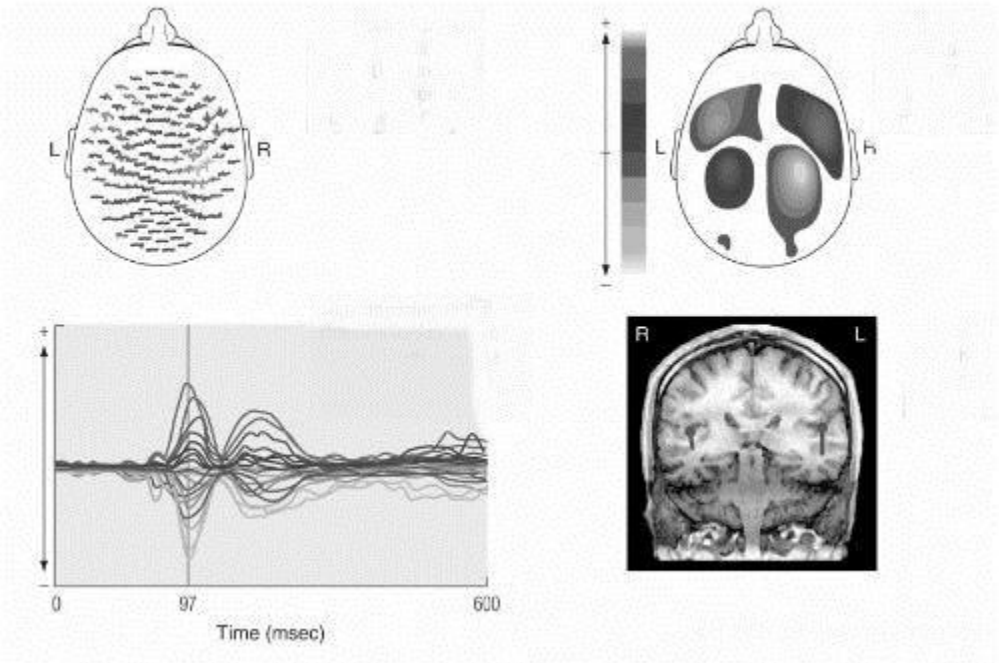
ANSWER: b

139.

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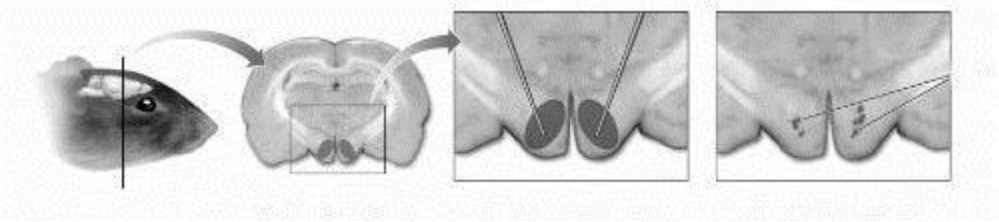


(see Figure 1.11)

The image in the lower right of this figure combines information from _____ with information from _____ imaging.

ANSWER: magnetoencephalography (MEG), magnetic resonance imaging (MRI)
MEG, magnetic resonance imaging (MRI)

140.



(see Figure 1.14)

In this illustration, a lesion is being produced in the rat's _____.

ANSWER: ventromedial hypothalamus (VMH)

141. Phrenologist like Gall believed that the shape of bumps on the skull indicated differences in the function of the brain under that skull. While this has been discredited, there is evidence the impact to the skull and the resulting trauma of a concussion produces changes that are measurable. Explain whether this 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 reciprocal relationships. We are often very aware of situations in which our biology affects our behavior, such as when we take a medication and notice its results. We are

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somewhat less aware of situations in which our behavior affects our biology. Describe one such situation. Discuss the importance of recognizing the ability of our behavior to influence important biological functions.

ANSWER: Typical answers might repeat the example from the textbook (ghrelin levels are affected by what you think about your milkshake). Other examples include meditation and the effects on heartrate, the effects of losing a competition on testosterone, and so forth. Recognizing the affects 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 since 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 any number of 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).

145. 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?

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 very 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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