Name:_____ Class:_____ Date:_____

Chapter 02

1. The study of the physiological basis of cognition is known as
   a. cognitive psychology.
   b. neuroscience.
   c. cognitive neuroscience.
   d. neuropsychology.

ANSWER: c

2. Barbara has recently been diagnosed with abdominal cancer. Her oncologist wants to determine the best treatment method to eliminate the tumors. Her gastroenterologist is focused on relieving her symptoms and restoring normal digestive functioning. Barbara's psychologist works to help minimize her anxiety and keep her spirits up. The fact that these doctors are considering Barbara's situation with different goals and from different perspectives is similar to the idea of _____ presented in your textbook.
   a. the dynamics of cognition
   b. idiographic evaluation
   c. nomothetic examination
   d. levels of analysis

ANSWER: d

3. Your author points out that studying the mind requires both _____ and _____ experiments.
   a. nomothetic; idiographic
   b. behavioral; physiological
   c. brain; body
   d. observational; correlational

ANSWER: b

4. Early studies of brain tissue that used staining techniques and microscopes from the 19th century described the "nerve net." These early understandings were in error in the sense that the nerve net was believed to be
   a. continuous.
   b. composed of discrete individual units.
   c. composed of cell bodies, axons, and dendrites.
   d. composed of neurotransmitters rather than neurons.

ANSWER: a

5. The key structural components of neurons are the
   a. cell body, cellular membrane, and transmitters.
   b. axon, dendrites, and glands.
   c. cell body, dendrites, and axons.
   d. transmitters, dendrites, and nodes of Ranvier.

ANSWER: c

6. In the mid-20th century, the study of the mind began using which technique or model inspired by digital computers?
   a. Information processing model

Chapter 02

b. Genetic processing model
c. Data processing model
d. Signal processing model

ANSWER: a

7. A synapse is
a. a tube filled with fluid that conducts electrical signals.
b. the structure that contains mechanisms to keep a neuron alive.
c. the structure that receives electrical signals from other neurons.
d. the gap that separates two different neurons.

ANSWER: d

8. Groups of interconnected neurons are referred to as
a. myelin sheaths.
b. potentiated somas.
c. neural circuits.
d. spreading activations.

ANSWER: c

9. Action potentials occur in the
a. cell body.
b. synapse.
c. neurotransmitters.
d. axon.

ANSWER: d

10. If the intensity of a stimulus that is presented to a touch receptor is increased, this tends to increase the _____ in the receptor's axon.
a. rate of nerve firing
b. size of the nerve impulses
c. speed of nerve conduction
d. All of these are correct.

ANSWER: a

11. When recording from a single neuron, stimulus intensity is represented by the
a. size of the action potentials.
b. size of the synapse.
c. firing rate of the neurotransmitters.
d. firing rate of the action potentials.

ANSWER: d

Chapter 02

12. Which of the following statements best describes how neurons communicate with one another?
    a. Dendrites make direct contact with each other.
    b. A chemical process takes place in the synapse.
    c. An electrical process takes place in the receptors.
    d. Action potentials travel across the synapse.

ANSWER: b

13. You are walking down the street and see a nice car drive by. You notice its color, movement, and shape. All of these features are processed
    a. in one localized area of the brain.
    b. by a specific object neuron.
    c. in different parts of the brain.
    d. through fMRI potentials.

ANSWER: c

14. When the axon is at rest, the inside of the neuron has a charge that is 70 millivolts more negative than the outside. This difference will continue as long as
    a. the neuron's receptor continues to be stimulated.
    b. the impulse is past the recording electrode.
    c. signals remain in the neuron.
    d. the neuron is at rest.

ANSWER: d

15. Neurons that respond to specific qualities of objects, such as orientation, movement, and length, are called
    a. retinal cells.
    b. feature detectors.
    c. dendrites.
    d. receptors.

ANSWER: b

16. If kittens are raised in an environment that contains only verticals, you would predict that most of the neurons in their visual cortex would respond best to the visual presentation of a
    a. brick wall.
    b. chain link fence.
    c. solid wall.
    d. picket fence.

ANSWER: d

17. Which organ is unique in that it appears to be static tissue?
    a. Heart
    b. Brain

Chapter 02

c. Lungs

d. Kidney

ANSWER: b

18. Edgar Adrian studied the relationship between nerve firing and sensory experience by measuring how the firing of a neuron from a receptor in the skin changed as he applied more pressure to the skin. He found that

a. the shape and height of the action potential increased as he increased the pressure.

b. the shape and height of the action potential decreased as he increased the pressure.

c. the rate of nerve firing increased as he increased the pressure.

d. the rate of nerve firing decreased as he increased the pressure.

ANSWER: c

19. When conducting an experiment on how stimuli are represented by the firing of neurons, you notice that neurons respond differently to different faces. For example, Arthur's face causes three neurons to fire, with neuron 1 responding the most and neuron 3 responding the least. Roger's face causes three different neurons to fire, with neuron 7 responding the least and neuron 9 responding the most. Your results support _____ coding.

a. specificity

b. distributed

c. sparse

d. divergence

ANSWER: c

20. Why is it easier to study brain tissue from newborn animals than brain tissue from adults?

a. The density of cells in a newborn brain is small compared with the density in an adult brain.

b. The density of cells in a newborn brain is higher compared with the density in an adult brain.

c. The nerve net system in newborn animals is less developed.

d. The nerve net system in newborn animals is more developed.

ANSWER: a

21. Which of the following statements is the most accurate with regard to specificity coding?

a. It is probably accurate, which explains why the human nervous system contains over one hundred billion neurons.

b. Research has found that specificity encoding does occur for lower animals, such as dogs and cats, but has not found this phenomenon to exist in human beings.

c. It is unlikely to be correct because there are too many stimuli in the world to have a separate neuron for each.

d. Specificity coding is one of the areas that is only theoretical and not applied, and thus there is no way to know if it truly exists in human beings.

ANSWER: c

22. Which of the following is consistent with the idea of localization of function?

a. Specific areas of the brain serve different functions.

b. Neurons in different areas of the brain respond best to different stimuli.

Chapter 02

c. Brain areas are specialized for specific functions.

d. All of these are correct.

ANSWER: d

23. Recording from single neurons in the brain has shown that neurons responding to specific types of stimuli are often clustered in specific areas. These results support the idea of

a. cortical association.

b. dissociation.

c. localization of function.

d. the information processing approach.

ANSWER: c

24. Paul Broca's and Carl Wernicke's research provided early evidence for

a. distributed processing.

b. localization of function.

c. prosopagnosia.

d. neural net theory.

ANSWER: b

25. What is the metabolic center of an individual neuron?

a. Nerve

b. Connectome

c. Axon

d. Cell body

ANSWER: d

26. The _____ lobe of the cortex receives information from all of the senses and is responsible for coordination of the senses, as well as higher cognitive functions such as thinking and problem solving.

a. subcortical

b. frontal

c. occipital

d. parietal

ANSWER: b

27. Which part of a neuron transmits signals to other neurons?

a. Dendrites

b. Axons

c. Cell body

d. Nerve net

ANSWER: b

Chapter 02

28. A 10-month-old baby is interested in discovering different textures, comparing the touch sensations between a soft blanket and a hard wooden block. Tactile signals such as these are received by the _____ lobe.

a. parietal
b. occipital
c. frontal
d. temporal

ANSWER: a

29. Josiah is trying to speak to his wife, but his speech is very slow and labored, often with jumbled sentence structure. Josiah may have damage to which area of the brain?

a. Broca's area
b. Parahippocampal place area (PPA)
c. Extrastriate body area (EBA)
d. Wernicke's area

ANSWER: a

30. Which parts of neurons are also known as a “nerve fiber”?

a. Touch receptor
b. Receptor
c. Axons
d. Dendrites

ANSWER: c

31. What is the gap between the end of a neuron's axon and the dendrites or cell body of another neuron known as?

a. Doctrine
b. Synapse
c. Axon
d. Dendrite

ANSWER: b

32. Brain imaging has made it possible to

a. determine which areas of the brain are involved in different cognitive processes.
b. view individual neurons in the brain.
c. show how environmental energy is transformed into neural energy.
d. view propagation of action potentials.

ANSWER: a

33. In which of the following body parts are neurons NOT present?

a. Eyes
b. Ears
c. Skin

Chapter 02

d. Arteries

ANSWER: d

34. Which part of the nervous system picks up information from the outside environment?

a. Dendrites
b. Axons
c. Synapses
d. Receptors

ANSWER: d

35. The fusiform face area (FFA) in the brain is often damaged in patients with

a. Broca's aphasia.
b. Wernicke's aphasia.
c. prosopagnosia.
d. Alzheimer's disease.

ANSWER: c

36. Sarah has experienced brain damage making it difficult for her to understand spatial layout. Which area of her brain has most likely sustained damage?

a. Fusiform face area (FFA)
b. Parahippocampal place area (PPA)
c. Extrastriate body area (EBA)
d. Functional magnetic area (FMA)

ANSWER: b

37. Ramon is looking at photos of athletes in a sports magazine. He is focusing on their body parts, particularly their chest and legs. Which part of Ramon's brain is activated by this viewing?

a. Fusiform face area (FFA)
b. Parahippocampal place area (PPA)
c. Extrastriate body area (EBA)
d. Functional magnetic area (FMA)

ANSWER: c

38. The idea that specific cognitive functions activate many areas of the brain is known as

a. localization of function.
b. distributed representation.
c. modularity.
d. aphasia.

ANSWER: b

39. Groups of neurons or structures that are connected within the nervous system are called_____.

Chapter 02

a. synaptic vesicles
b. neuronal bridges
c. neural networks
d. fused conduits

ANSWER: c

40. Which of the following is similar to early ideas scientists had about the brain's physical properties?
a. A tree
b. A web
c. A pipe
d. A river

ANSWER: b

41. What is a key difference between dendrites and axons?
a. One is internally activated and the other is externally activated.
b. One has physical form and the other lacks physical form.
c. One sends information and the other receives information.
d. One has a positive charge and the other has a negative charge.

ANSWER: c

42. It's often said that "life doesn't exist in a vacuum." However, the emptiness of _____ is critical for brain functioning.
a. nerves
b. receptors
c. dendrites
d. synapses

ANSWER: d

43. Taking clay and sand to create bricks, which are then used to build modular wall panels, which are then assembled to construct tall buildings, is similar to which of the following neural concepts?
a. Specificity coding
b. Localization of function
c. Hierarchical processing
d. Distributed representation

ANSWER: c

44. Before the advent of intercoms, old mansions had a sash in each room. Each sash was connected to a bell on a master board in the servants' office. When someone pulled a sash in a particular room, a bell corresponding to the room would ring on the master board, informing a servant where to go to provide assistance.
This system is similar to which of the following?
a. Sparse coding
b. Localization coding

c. Population coding
d. Specificity coding

ANSWER: d

45. Which of the following could be considered as always taking a "working vacation"?
a. Temporal lobe
b. Default mode network
c. Broca's area
d. Neural networks

ANSWER: b

46. Which of the following terms does NOT reflect functional network activity in the brain?
a. Responsive
b. Conditional
c. Consistent
d. Variable

ANSWER: c

47. Determining the sequence of DNA in humans was a major scientific advance that opened the door to new ideas about illness and approaches to treatment. An individual's unique DNA sequence is similar to which of the following?
a. Salience
b. Voxel
c. Connectome
d. Aphasia

ANSWER: c

48. Describe how neurons communicate. Mention the key components of the neurons that are involved. Explain the process whereby the electrical signal (the information) is transferred from one neuron to another.
ANSWER: Answer not provided

49. Explain how action potentials change in response to stimulus intensity. Use an example from the human visual system to illustrate this process.
ANSWER: Answer not provided

50. Explain the concept of experience-dependent plasticity in the brain. Provide a hypothetical example of how this might occur in a young child.
ANSWER: Answer not provided

51. List the three perspectives on the problem of sensory coding and provide an example of each.
ANSWER: Answer not provided

52. Why are memories represented in the brain differently than sensory stimuli? Give an example comparing how the brain would process a visual stimulus and a memory, and explain your reasoning.

Chapter 02

ANSWER: Answer not provided

53. Explain the difference between functional connectivity and structural connectivity. Provide an example to support your thinking.
ANSWER: Answer not provided

54. The value that stays the same as long as there are no signals in the neuron is known as
a. nerve impulse.
b. resting potential.
c. action potential.
d. nerve transmission.

ANSWER: b

55. Which substance is released when signals reach the synapse at the end of the axon?
a. Axon
b. Receptors
c. Dendrites
d. Neurotransmitters

ANSWER: d

56. What does the principal of neural representation state?
a. Everything a person experiences is based on representations in the person's nervous system.
b. Everything a person experiences is based on the position of neurotransmitters in the person's nervous system.
c. Everything a person experiences is based on position of synapses in the person's nervous system.
d. Everything a person experiences is based on the capacity of receptors in the person's nervous system.

ANSWER: a

57. The idea that an object could be represented by the firing of a specialized neuron that responds only to that object is called _____.
a. specificity coding
b. population coding
c. sparse coding
d. hierarchical coding

ANSWER: a