Chapter 12 Nervous System Review Assignment

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Which part of a neuron receives an impulse from the previous neuron?
   a. axon  
   b. dendrite  
   c. cell body  
   d. axoplasm

____ 2. At the place where one neuron transmits an impulse to another neuron there is a (an)
   a. synapse.  
   b. cell body.  
   c. interneuron.  
   d. node of Ranvier.

____ 3. Which of the following refers to a gap in the myelin sheath surrounding a neuron?
   a. axon  
   b. synapse  
   c. interneuron  
   d. node of Ranvier

____ 4. Which of the following is the fatty insulating layer that surrounds white matter but is absent in grey matter?
   a. myelin  
   b. synapse  
   c. axoplasm  
   d. axomembrane

____ 5. Which of the following statements correctly describes the function of a component of a reflex arc?
   a. The brain reacts to sensory neurons.  
   b. Sensory neurons gather information from effectors.  
   c. Sensory receptors receive stimuli from interneurons.  
   d. Motor neurons conduct impulses from interneurons to effectors.

____ 6. Which of the following correctly describes the ion flow for a neuron during repolarization?
   a. K⁺ are flowing in  
   b. K⁺ are flowing out  
   c. Na⁺ are flowing in  
   d. Na⁺ are flowing out

____ 7. Neurotransmitters are released into the synaptic cleft by
   a. osmosis.  
   b. exocytosis.  
   c. endocytosis.  
   d. phagocytosis.
8. Which of the following correctly describes the ion flow for a neuron during depolarization?
   a. $K^+$ flows in
   b. $Na^+$ flow in
   c. $K^+$ flows out
   d. $Na^+$ flow out

9. Use the diagram above to answer the next question.
   In the above diagram, the part of the brain that serves as a link between the nervous system and the endocrine system is
   a. structure A.
   b. structure C.
   c. structure E.
   d. structure F.

10. Use the diagram above to answer the next question.
    Which part of the brain is responsible for muscle coordination during a complicated dance routine?
    a. structure A
    b. structure B
    c. structure C
    d. structure D

11. Use the diagram above to answer the next question.
    Which region of the brain is responsible for integrating information between the two hemispheres of the brain?
    a. structure D
    b. structure E
    c. structure F
    d. structure G
____ 12. Use the diagram above to answer the next question.
Which region of the brain is responsible for making you feel thirsty when you have not had enough to drink?
   a. structure D  
   b. structure E  
   c. structure F  
   d. structure G

____ 13. Use the diagram above to answer the next question.
Which region of the brain is responsible for sorting and relaying information that is received from the various sensory receptors in the body?
   a. structure A  
   b. structure B  
   c. structure C  
   d. structure D

____ 14. Use the diagram above to answer the next question.
Which region of the brain is responsible for controlling hormones released from the pituitary gland?
   a. structure D  
   b. structure E  
   c. structure F  
   d. structure G

____ 15. Which part of the brain is associated with memory?
   a. cerebrum  
   b. thalamus  
   c. cerebellum  
   d. corpus callosum

____ 16. Which of the following divisions of the nervous system is active during the “fight-or-flight” response?
   a. central nervous system  
   b. somatic nervous system  
   c. sympathetic nervous system  
   d. parasympathetic nervous system

____ 17. The neurotransmitter released when the parasympathetic nervous system responds is
   a. serotonin.  
   b. epinephrine.  
   c. acetylcholine.  
   d. norepinephrine.

____ 18. Which part of the brain controls body temperature, hunger, and thirst?
   a. cerebrum  
   b. cerebellum  
   c. hypothalamus  
   d. medulla oblongata
19. The neurotransmitter released by the sympathetic neurons is
   a. dopamine.
   b. endorphin.
   c. acetylcholine.
   d. norepinephrine.

20. Which of the following actions is not an example of a reflex action?
   a. catching a football
   b. salivating at the sight of food
   c. closing the eyelids when an insect comes towards the eyes
   d. jerking the knee when the tendon below the knee is tapped

21. The spaces between the Schwann cells of a neuron are known as
   a. axons.
   b. synapses.
   c. dendrites.
   d. nodes of Ranvier.

22. Which of the following best describes the information pathway that leads to a response when a stimulus is received?
   a. sensory neuron → gland → motor neuron → muscle
   b. sensory neuron → interneuron → motor neuron → muscle
   c. sensory receptor → interneuron → muscle → motor neuron
   d. sensory receptor → sensory neuron → motor neuron → muscle

23. Which of the following types of nervous system is also known as the rest-and-digest system?
   a. central nervous system
   b. somatic nervous system
   c. sympathetic nervous system
   d. parasympathetic nervous system

24. Which of the following neurotransmitters is the only one used by the parasympathetic nervous system?
   a. dopamine
   b. epinephrine
   c. acetylcholine
   d. norepinephrine

25. What would be the resting membrane potential of a neuron expressed in millivolts?
   a. –70 mV
   b. –35 mV
   c. +35 mV
   d. +70 mV

26. Which of the following causes depolarization?
   a. the sodium-potassium exchange pump
   b. flow of Na⁺ into the axoplasm of a neuron
   c. presence of potassium ions in the axoplasm
   d. presence of negatively charged proteins inside the neuron
27. After an action potential has occurred in a myelinated neuron, Na⁺ inside the axon diffuse along the membrane causing
   a. repolarization at the adjacent node of Ranvier.
   b. depolarization at the adjacent node of Ranvier.
   c. repolarization at the adjacent region of the membrane.
   d. depolarization at the adjacent region of the membrane.

28. Multiple sclerosis is a disorder characterized by the breakdown of the myelin sheath around axons in the central nervous system. The absence of a fully functional myelin sheath causes
   a. an increase in the amount of saltatory conduction.
   b. neural impulses to travel more slowly than normal.
   c. abnormal functioning of the sodium-potassium pump.
   d. an attack on the Schwann cells by the immune system.

29. If the dendrite of a sensory neuron is stimulated, which of the following processes will occur next?
   a. repolarization will occur in the axon of a motor neuron
   b. depolarization will occur in the axon of a motor neuron
   c. repolarization will occur in the axon of the same neuron
   d. depolarization will occur in the axon of the same neuron

30. Use the diagram above to answer the next question.
    What role does this cell perform?
    a. It conducts a nerve impulse toward a muscle or a gland.
    b. It conducts a nerve impulse to the central nervous system.
    c. It conducts a nerve impulse within the central nervous system.
    d. It conducts a nerve impulse away from the central nervous system.
31. Use the diagram above to answer the next question.
Which part of the structure above is found within the central nervous system?
   a. the dendrite
   b. the effector
   c. the entire neuron
   d. the axon terminal

32. Use the diagram above to answer the next question.
Which of the following actions will cause depolarization in this cell?
   a. stimulation of an effector
   b. stimulation at a sensory receptor
   c. depolarization at the axon of a motor neuron
   d. depolarization at the dendrite of an interneuron

33. Use the diagram above to answer the next question.
Which component of this cell is responsible for directing the production of neurotransmitters?
   a. axon
   b. effector
   c. dendrite
   d. cell body

34. Use the diagram above to answer the next question.
If an action potential is generated in the dendrite of this cell, which of these actions will occur next?
   a. stimulation of a motor neuron
   b. depolarization in the axon of an interneuron
   c. depolarization in the axon of a sensory neuron
   d. release of neurotransmitter from an axon terminal
35. Use the diagram above to answer the next question.
When an action potential reaches the end of this cell, which of the following events will occur?
   a. an effector will be stimulated and the muscle will respond
   b. neurotransmitter will be released and will bind to receptors in an interneuron
   c. neurotransmitter will be released and will bind to receptors in a motor neuron
   d. neurotransmitter will be released and will bind to receptors in a sensory neuron

36. Use the diagram above to answer the next question.
What role does this cell perform?
   a. It transmits nerve impulses toward an effector.
   b. It transmits nerve impulses away from a receptor.
   c. It releases neurotransmitter to stimulate an interneuron.
   d. It releases neurotransmitter to stimulate a sensory neuron.

37. Use the diagram above to answer the next question.
Which part of the structure above is not found within the central nervous system?
   a. dendrite
   b. cell body
   c. axon terminals
   d. the entire neuron

38. Use the diagram above to answer the next question.
Which of the following actions will cause depolarization in this cell?
   a. stimulation of an effector
   b. repolarization in sensory neuron
   c. resting potential in an interneuron
   d. exocytosis of neurotransmitter from an interneuron
____ 39. **Use the graph above to answer the next question.**
During which indicated period is depolarization occurring?
\[\text{a. A} \quad \text{b. B} \quad \text{c. C} \quad \text{d. D}\]

____ 40. **Use the graph above to answer the next question.**
During which indicated period are sodium ions rapidly entering the axoplasm?
\[\text{a. A} \quad \text{b. B} \quad \text{c. C} \quad \text{d. D}\]

____ 41. **Use the graph above to answer the next question.**
During which indicated time interval is potassium in highest concentration in the axoplasm?
\[\text{a. A} \quad \text{b. B} \quad \text{c. C} \quad \text{d. D}\]

____ 42. **Use the graph above to answer the next question.**
At which point on the graph do sodium gates open?
\[\text{a. at the beginning of interval A} \quad \text{b. at the beginning of interval B} \quad \text{c. at the beginning of interval C} \quad \text{d. at the beginning of interval D}\]
43. Use the diagram above to answer the next question.
If the nerve is stimulated at position 1, in which of the following locations will an action potential occur next?
   a. in the axon of a motor neuron
   b. in the axon of a sensory neuron
   c. in the dendrite of a motor neuron
   d. in the dendrite of a sensory neuron

44. Use the diagram above to answer the next question.
If the nerve is severed at position 2, which of the following conditions will result?
   a. the impulse will be detected, but a response will not occur
   b. the impulse will be detected and a response will still occur
   c. the impulse will not be detected and no response will occur
   d. the impulse will not be detected, but a response will still occur

45. Which of the following responses occurs during a “fight or flight” response?
   a. accelerated heart rate
   b. a decrease in respiratory rate
   c. increase in blood flow to digestive tract
   d. decrease in blood flow to skeletal muscles