***9.1 Introduction***

1. The general function of neurons is to \_\_\_\_\_\_\_\_\_ , whereas the general functions of neuroglia are to\_\_\_\_\_\_\_\_\_ . (p. 212)

2. Match the neuron part on the top to its description on the bottom.

(p. 212)

(1) Dendrite \_\_\_\_\_\_

(2) Axon \_\_\_\_\_\_

(3) Cell body \_\_\_\_\_\_

A. A cell process that sends information

B. One of usually several cell processes that receive information

C. The rounded part of a neuron

3. Explain the relationship between the CNS and the PNS. (p. 212)

***9.2 General Functions of the Nervous System***

4. List the general functions of the nervous system. (p. 213)

***9.3 Neuroglial Cells***

5. Match the types of neuroglial cells on the top to their functions on the bottom. (p. 214)

(1) Ependymal cells \_\_\_\_\_

(2) Oligodendrocytes \_\_\_\_\_

(3) Astrocytes \_\_\_\_\_\_

(4) Schwann cells \_\_\_\_\_\_

(5) Microglial cells \_\_\_\_\_\_

A. Form a myelin sheath around peripheral nerves

B. Phagocytize cellular debris and bacteria

C. Line inner parts of ventricles and spinal cord

D. Form scar tissue and regulate ion and nutrient concentrations in the CNS

E. Form a myelin sheath around neurons in the CNS

***9.4 Neurons***

6. Describe three structures found in neurons that are also in other cell types, and describe two structures that are unique to neurons. (p. 214)

7. The part of a Schwann cell that contributes to the myelin sheath is the, and the part that contributes to the neurilemma is the. (p. 215)

8. Distinguish between myelinated and unmyelinated axons. (p. 217)

9. Distinguish among multipolar, bipolar, and unipolar neurons. (p. 218)

10. Distinguish among sensory neurons, interneurons, and motor neurons. (p. 218)

11. Distinguish between ganglia and nuclei. (p. 218)

***9.5 The Synapse***

12. Define synapse. (p. 219)

13. Explain how information passes from one neuron to another. (p. 220)

***9.6 Cell Membrane Potential***

14. Explain how a membrane becomes polarized. (p. 220)

15. Describe how ions associated with nerve cell membranes are distributed. (p. 220)

16. Define resting potential. (p. 221)

17. Explain the relationship between threshold potential and an action potential. (p. 223)

18. List the events that occur during an action potential. (p. 223)

***9.7 Nerve Impulses***

19. Choose the correct sequence of events along an axon: (p. 224)

a. Resting potentials are propagated along a stimulated axon, causing an overall action potential.

b. A threshold stimulus opens K+ channels and the ions diffuse in, depolarizing the cell membrane. Then Na+ channels open, Na+ exits, and the cell membrane repolarizes, generating an action potential that stimulates adjacent cell membrane, forming the nerve impulse.

c. A threshold stimulus opens Na+ channels and the ions diffuse in, depolarizing the cell membrane. Then K+ channels open, K+ exits, and the cell membrane repolarizes, generating an action potential that stimulates adjacent cell membrane, forming the nerve impulse.

d. A threshold stimulus opens Na+ channels and the ions diffuse in, depolarizing the cell membrane. Then K+ channels open, K+ exits, and the cell membrane repolarizes, generating a nerve impulse that stimulates adjacent cell membrane, forming the action potential.

e. Action potentials occur at different points along an axon, then join to generate a nerve impulse.

20. Explain why a myelin sheath covering an entire axon would inhibit conduction of a nerve impulse. (p. 225)

21. “All-or-none” response in nerve impulse conduction means that. (p. 225)

***9.8 Synaptic Transmission***

22. Distinguish between excitatory and inhibitory actions of neurotransmitters. (p. 225)

23. Neurotransmitters are synthesized in and are stored in. (p. 226)

24. Match the neurotransmitter on the left to its description on the right. (p. 226)

***9.9 Impulse Processing***

26. Describe the components of a neuronal pool. (p. 227)

27. “Facilitation in a neuronal pool” refers to \_\_\_\_\_\_\_\_\_ . (p. 227)

***9.10 Types of Nerves***

29. Describe how sensory, motor, and mixed nerves differ. (p. 228)

***9.11 Nerve Pathways***

30. Distinguish between a reflex arc and a reflex. (p. 228)

31. Describe the components of a reflex arc and their functions. (p. 228)

32. List three body functions that reflexes control. (p. 228)

***9.13 Spinal Cord***

34. Describe the structure of the spinal cord. (p. 232)

35. Distinguish between the ascending and descending tracts of the spinal cord. (p. 233)

***9.14 Brain***

36. Name the four major parts of the brain and describe their general functions. (p. 234)

37. The area of the brain that connects parts of the nervous system to particular visceral activities is the: (p. 234)

a. cerebrum

b. cerebellum

c. brainstem

d. diencephalon

e. corpus callosum

38. The structure that connects the cerebral hemispheres is the\_\_\_\_\_\_\_\_\_\_\_. (p. 235)

39. Distinguish between a sulcus and a fissure. (p. 236)

40. Relate the lobes of the cerebral hemispheres to the skull bones. (p. 236)

41. Locate the motor, sensory, and association areas of the cerebral cortex, and describe the general functions of each. (p. 237)

42. Define hemisphere dominance. (p. 237)

43. The function of the basal nuclei is to\_\_\_\_\_\_\_\_\_\_ . (p. 238)

44. Locate the ventricles in the brain. (p. 238)

45. Explain how cerebrospinal fluid is produced and how it functions. (p. 239)

46. The part of the diencephalon that regulates hunger, weight, water and electrolyte balance, sleep and wakefulness, temperature, arterial blood pressure, heart rate, production of substances that stimulate the pituitary gland, and movement and secretion in areas of the digestive tract is the: (p. 240)

a. thalamus

b. pineal gland

c. infundibulum

d. hypothalamus

e. mammillary bodies

47. Define limbic system, and explain its functions. (p. 240)

48. The parts of the brainstem are the\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_. (p. 241)

49. List the functions of the three parts of the brainstem. (p. 241)

50. Vomiting is controlled by: (p. 242)

a. the reticular formation

b. a nucleus within the medulla oblongata

c. the midbrain

d. the pons

e. the thalamus

51. Describe what happens to the body when the reticular formation receives sensory impulses, and what happens when it does not receive stimulation. (p. 242)

52. Describe the functions of the cerebellum. (p. 242)

***9.15 Peripheral Nervous System***

53. Distinguish between the somatic nervous system and the autonomic nervous system. (p. 242)

54. Distinguish between cranial nerves and spinal nerves. (pp. 243, 247)

55. Name all the cranial nerves in order and know their basic functions. (pp. 243 – 246)

58. Define plexus, and locate the major plexuses of the spinal nerves. (p. 248)

***9.16 Autonomic Nervous System***

59. Describe the general functions of the autonomic nervous system. (p. 248)

60. Distinguish between the sympathetic and parasympathetic divisions of the autonomic nervous system. (p. 249)

61. Distinguish between preganglionic and postganglionic nerve fibers. (p. 249)

62. The effects of the sympathetic and parasympathetic autonomic divisions differ because \_\_\_\_\_\_\_\_\_\_\_\_. (p. 251)

63. List two ways in which the CNS controls autonomic activities. (p. 251)