

## UNIT 2 STUDY QUESTIONS

1. Describe the basic function and organization of the nervous system.
2. Describe the components and their functions of a typical neuron.
3. Define myelinated and unmyelinated axons.
4. Describe the functions of sensory neurons, interneuron, and motor neurons.
5. Describe the formation of a membrane potential. Include electrical force, chemical force, membrane permeabilities, and movement of ions.
6. Define the general terms and possible ion permeability changes of depolarization, hyperpolarization, repolarization.
7. Discuss the characteristics of a graded potential.
8. Discuss the permeability changes of the three phases of an action potential.
9. Explain the characteristics of an action potential. Include location, strength, refractory period, and impulse transmission along the axon.
10. Discuss the steps at synaptic transmission and the differences between excitatory and inhibitory synapses.
11. Discuss summation and synaptic integration involved with EPSPs and IPSPs.
12. Discuss the synthesis and degradation (removal) of acetylcholine and norepinephrine.
13. Discuss the five ways drugs can influence the nervous system. Give examples.
14. Discuss the blood brain barrier and its importance.
15. Discuss the functions of the spinal cord.
16. Briefly describe the functions of the cerebral hemispheres, cerebral lobes, basal nuclei, limbic system, reticular activating system, thalamus, hypothalamus, midbrain, pons, medulla oblongata, and cerebellum.
17. Discuss reflexes, voluntary motor control, and language as integrated CNS functions.
18. Discuss the different types of memory and their locations within the brain.
19. Describe how the CNS interprets stimulus strength.
20. Describe the four types of sensory modalities.
21. Discuss pain.
22. Discuss the features of the autonomic system.
23. Compare and contrast the sympathetic system to the parasympathetic system. Include neurotransmitter released, and neuron name and the receptor types.
24. List the actions of sympathetic and parasympathetic stimulation to the various organs in the body.
25. Describe the general actions of the different types of sympathetic receptors ( $\alpha_1$ ,  $\alpha_2$ ,  $\beta_1$ , and  $\beta_2$ ) on various organs.

26. Describe the general actions of the nicotinic (alpha and beta) and muscarinic (M1-M3) receptors of acetylcholine and which organs they effect.
27. Compare the general differences of the autonomic system to the somatic system.
28. Discuss the features of the somatic system neurotransmitter, neuron name, and voluntary nature.
29. Describe the functional components of motor units and the anatomy of the neuromuscular junction (motor end plate).
30. List the four properties of muscle tissue.
31. Describe the anatomical arrangements of skeletal muscle from the gross level to cellular level and molecular level.
32. Describe the events of the cross bridge cycle.
33. Describe the steps of excitation and contraction coupling in a skeletal muscle fiber.
34. Describe the refractory period in a skeletal muscle fiber.
35. Describe the events in the relaxation of a skeletal muscle fiber.
36. Compare EPSP's to end plate potentials. Include relative strengths in regard to generating action potentials.
37. Describe the three sources of ATP production and when they are used during muscle activity.
38. Define the oxygen debt and the factors that contribute to the debt.
39. Discuss the factors that cause the different types of muscle fatigue.
40. Describe the three periods of a single muscle twitch and their causes.
41. Discuss the factors that influence the force of contraction in a single muscle fiber.
42. Discuss the mechanisms behind the following whole muscle responses. Graded muscle response (motor unit recruitment), and asynchronous motor unit recruitment.
43. Discuss the functions and features of the three types of muscle fibers.