## STUDY GUIDE: Nervous system, Nerve Impulse Transmission and Reflex Arc Chapter 48 KEY TERMS

neuron cell body dendrite axon glial cells myelin sheath nodes of Ranvier Schwann cell synapse sensory neuron motor neuron interneuron astrocytes blood-brain barrier

ganglia nerve nerve impulse resting potential membrane potential equilibrium potential threshold all-or-none response action potential voltage-gated(sensitive) channel sodium-potassium pump refectory period synapse synaptic terminal synaptic cleft neurotransmitter 7 postsynaptic membrane acetylcholine endorphins dopamine serotonin receptor effector reflex arc dorsal-root ganglion

## QUESTIONS

1. Describe the structure of a typical neuron and, using a diagram point out the axon, dendrite, cell body, and myelin sheath. Indicate the path of information flow and point out a synapse and neuromuscular joint.

2. Explain how a nerve impulse is conducted along the neuron, using the terms stimulus, threshold, membrane potential, action potential, voltage-sensitive channel, all-or-none response and refractory period.

3. Discuss the basis for the polarization of the nerve cell membrane, considering the relative amounts of sodium, potassium, and negatively charged ions inside and outside the neuron, and state whether the outside of the resting neuron is charged positively or negatively with respect to the inside.

4. Explain in some detail how an impulse is transmitted(propagated) along a neuron fiber; specify which ions move and in what order when the fiber is stimulated, and explain what is meant by voltage-sensitive channels. Using a diagram, Explain how the nerve impulse is propagated along the neuron.

5. Explain how diffusion, electrostatic attraction, and the sodium-potassium pump act to reestablish the original ionic balance and keep the neuron functioning.

6. Using a diagram, identify the synaptic terminal, the presynaptic membrane, postsynaptic membrane, and synaptic cleft. Describe the events occurring at a synapse when an action potential arrives, and explain how the impulse is transmitted across the synapse and what must happen for an action potential to be induced in the postsynaptic neuron.

7. Name three transmitter substances(neurotransmitters).

8. Using a diagram, Trace the flow of information through a reflex arc.