

Nervous System Packet #1

ORGANIZATION OF THE NERVOUS SYSTEM

2. Choose the key responses that best correspond to the descriptions provided in the following statements. Insert the appropriate letter or term in the answer blanks.

Key Choices

- A. Autonomic nervous system C. Peripheral nervous system (PNS)
 B. Central nervous system (CNS) D. Somatic nervous system

1. Nervous system subdivision that is composed of the brain and spinal cord
2. Subdivision of the PNS that controls voluntary activities such as the activation of skeletal muscles
3. Nervous system subdivision that is composed of the cranial and spinal nerves and ganglia
4. Subdivision of the PNS that regulates the activity of the heart and smooth muscle, and of glands; it is also called the involuntary nervous system
5. A major subdivision of the nervous system that intercepts incoming information and issues orders
6. A major subdivision of the nervous system that serves as communication lines, linking all parts of the body to the CNS

4. Relative to neuron anatomy, match the anatomical terms given in Column B with the appropriate descriptions of functions provided in Column A. Place the correct term or letter response in the answer blanks.

Column A

1. Releases neurotransmitters
2. Conducts electrical currents toward the cell body
3. Increases the speed of impulse transmission
4. Location of the nucleus
5. Generally conducts impulses away from the cell body

Column B

- A. Axon
- B. Axonal terminal
- C. Dendrite
- D. Myelin sheath
- E. Cell body

6. Using key choices, select the terms identified in the following descriptions by inserting the appropriate letter or term in the spaces provided.

Key Choices

- A. Afferent neuron F. Neuroglia K. Proprioceptors
 B. Association neuron G. Neurotransmitters L. Schwann cells
 C. Olfactory sense organs H. Nerve M. Synapse
 D. Efferent neuron I. Nodes of Ranvier N. Stimuli
 E. Ganglion J. Nuclei O. Tract

1. Sensory receptors found in the skin, which are specialized to detect temperature, pressure changes, and pain
2. Specialized cells that myelinate the fibers of neurons found in the PNS
3. Junction or point of close contact between neurons
4. Bundle of nerve processes inside the CNS
5. Neuron, serving as part of the conduction pathway between sensory and motor neurons
6. Gaps in a myelin sheath
7. Collection of nerve cell bodies found outside the CNS
8. Neuron that conducts impulses away from the CNS to muscles and glands
9. Sensory receptors found in muscle and tendons that detect their degree of stretch
10. Changes, occurring within or outside the body, that affect nervous system functioning
11. Neuron that conducts impulses toward the CNS from the body periphery
12. Chemicals released by neurons that stimulate other neurons, muscles, or glands

7. Figure 7-1 is a diagram of a neuron. First, label the parts indicated on the illustration by leader lines. Then choose different colors for each of the structures listed below and use them to color in the coding circles and corresponding structures in the illustration. Next, circle the term in the list of three terms to the left of the diagram that best describes this neuron's structural class.

Finally, draw arrows on the figure to indicate the direction of impulse transmission along the neuron's membrane.

- Axon
- Dendrites
- Cell body
- Myelin sheath

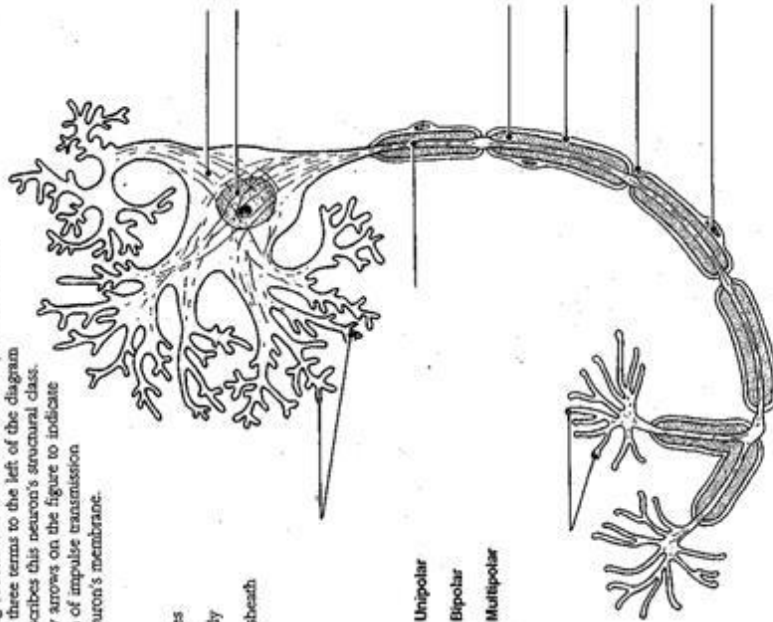


Figure 7-1

8. List in order the minimum elements in a reflex arc from the stimulus to the activity of the effector. Place your responses in the answer blanks.

1. Stimulus _____
2. _____
3. _____
4. _____
5. Effector organ _____

9. Using the key choices, identify the terms defined in the following statements. Place the correct term or letter response in the answer blanks.

Key Choices

- A. Action potential
- B. Depolarization
- C. Polarized
- D. Potassium ions
- E. Refractory period
- F. Repolarization
- G. Sodium ions
- H. Sodium-potassium pump

1. Period of repolarization of the neuron during which it cannot respond to a second stimulus _____
2. State in which the resting potential is reversed as sodium ions rush into the neuron _____
3. Electrical condition of the plasma membrane of a resting neuron _____
4. Period during which potassium ions diffuse out of the neuron _____
5. Transmission of the depolarization wave along the neuron's membrane _____
6. The chief positive intracellular ion in a resting neuron _____
7. Process by which ATP is used to move sodium ions out of the cell and potassium ions back into the cell, completely restoring the resting conditions of the neuron _____

10. Using the key choices, identify the types of reflexes involved in each of the following situations.

Key Choices

- A. Somatic reflex(es)
 - B. Autonomic reflex(es)
1. Patellar (knee-jerk) reflex _____
 2. Pupillary light reflex _____
 3. Effectors are skeletal muscles _____
 4. Effectors are smooth muscle and glands _____
 5. Flexor reflex _____
 6. Regulation of blood pressure _____
 7. Salivary reflex _____

18. Refer to Figure 7-2, showing a reflex arc, as you complete this exercise. First, briefly answer the following questions by entering your responses in the spaces provided.

1. What is the stimulus? _____
2. What is the effector? _____
3. How many synapses occur in this reflex arc? _____

Now, add different colors for each of the following structures and use them in color in the coding exercise corresponding sections in the diagram. Finally, draw arrows on the figure indicating the direction of impulse transmission through the reflex pathway.

- Receptor region
- Afferent neuron
- Effector neuron
- Effector
- Association neuron

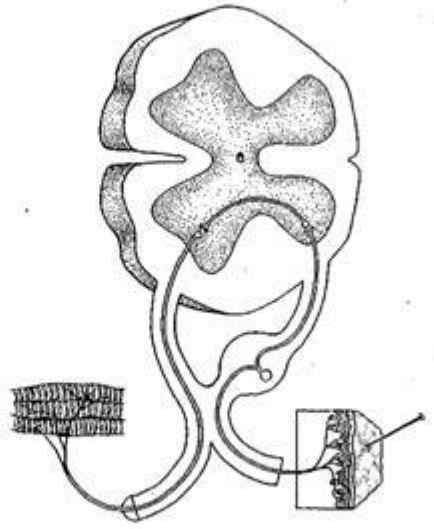


Figure 7-2

22. Circle the term that does not belong in each of the following groupings:

1. Astrocyte Neuron Oligodendrocyte Microglia
2. K^+ enters the cell Na^+ leaves the cell Repolarization Refractory period
3. Nodes of Ranvier Myelin sheath Unmyelinated Salivary conduction
4. Presynaptic vesicle Voluntary act Involuntary act Reflex
5. Oligodendrocytes Schwann cells Myelin Microglia
6. Chemotaxis receptors Free dendritic endings Soma Pain and touch
7. Cell swelling High Na^+ Low Na^+ High K^+