Chapter 35 Nervous System

Section 35–1 Human Body Systems (pages 891–896)

Key Concepts
- How is the human body organized?
- What is homeostasis?

Organization of the Body (pages 891–894)
1. List the levels of organization in a multicellular organism, from smallest to largest.
   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________

Match the organ system with its function.

<table>
<thead>
<tr>
<th>Organ System</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Nervous system</td>
<td>a. Stores mineral reserves and provides a site for blood cell formation</td>
</tr>
<tr>
<td>3. Skeletal system</td>
<td>b. Provides oxygen and removes carbon dioxide</td>
</tr>
<tr>
<td>4. Integumentary system</td>
<td>c. Coordinates the body’s response to changes in its internal and external environments</td>
</tr>
<tr>
<td>5. Endocrine system</td>
<td>d. Helps produce voluntary movement, circulate blood, and move food</td>
</tr>
<tr>
<td>6. Lymphatic/immune systems</td>
<td>e. Controls growth, development, metabolism, and reproduction</td>
</tr>
<tr>
<td>7. Muscular system</td>
<td>f. Eliminates wastes and maintains homeostasis</td>
</tr>
<tr>
<td>8. Reproductive system</td>
<td>g. Serves as a barrier against infection and injury</td>
</tr>
<tr>
<td>9. Respiratory system</td>
<td>h. Converts food so it can be used by cells</td>
</tr>
<tr>
<td>10. Excretory system</td>
<td>i. Helps protect the body from disease</td>
</tr>
<tr>
<td>11. Circulatory system</td>
<td>j. Produces reproductive cells</td>
</tr>
<tr>
<td>12. Digestive system</td>
<td>k. Brings materials to cells, fights infection, and helps to regulate body temperature</td>
</tr>
</tbody>
</table>

13. What are four types of tissues found in the human body? ____________________

14. The eye is an example of a(an) ____________________.

15. Circle the letter of the type of tissue that covers interior and exterior body surfaces.
   a. nervous
   b. connective
   c. epithelial
   d. muscle

Maintaining Homeostasis (pages 895–896)

16. Circle the letter of the type of tissue that connects body parts.
   a. nervous
   b. connective
   c. epithelial
   d. integumentary

17. The process of maintaining a controlled, stable internal environment is called ____________________.

18. The process in which a stimulus produces a response that opposes the original stimulus is referred to as ____________________.

19. Fill in the missing labels in the diagram to show how a thermostat uses feedback inhibition to maintain a stable temperature in a house.

20. Is the following sentence true or false? The part of the brain that monitors and controls body temperature is the hypothalamus. ________________

21. What happens if nerve cells sense that the core body temperature has dropped below 37°C? ________________

22. What happens if the body temperature rises too far above 37°C? ________________
Section 35–2  The Nervous System  (pages 897–900)

Key Concepts
- What are the functions of the nervous system?
- How is the nerve impulse transmitted?

Introduction  (page 897)
1. What is the function of the nervous system?

Neurons  (pages 897–898)
2. How are neurons classified?
3. What are three types of neurons?
   a.
   b.
   c.
4. Is the following sentence true or false? Sensory neurons carry impulses from the brain and the spinal cord to muscles and glands.
5. Label the following features in the drawing of a neuron: cell body, dendrites, and axon.
6. What is the function of the myelin sheath?

The Nerve Impulse  (pages 898–899)
7. The electrical charge across the cell membrane of a neuron in its resting state is called its ________________.
8. How does a nerve impulse begin?
9. Circle the letter of the choice that describes an action potential.
   a. Reversal of charges due to the flow of positive ions into a neuron
   b. Increase in negative ions in a neuron due to the flow of potassium out of the cell
   c. Change to a negative charge due to the flow of sodium ions out of a neuron
   d. Reversal of charges due to the flow of negative ions into a neuron
10. The minimum level of a stimulus that is required to activate a neuron is called the ________________.
11. How does a nerve impulse follow the all-or-nothing principle?

The Synapse  (page 900)
12. What are neurotransmitters?
13. Describe what happens when an impulse arrives at an axon terminal.

Reading Skill Practice
When you read about a complex process, representing the process with a diagram can help you understand it better. Make a diagram to show how a nerve impulse is transmitted from one cell to another. Do your work on a separate sheet of paper.
### Section 35–3 Divisions of the Nervous System  
**(pages 901–905)**

#### Key Concepts
- What are the functions of the central nervous system?
- What are the functions of the two divisions of the peripheral nervous system?

#### Introduction  
**(page 901)**
1. What is the function of the central nervous system?

#### The Central Nervous System  
**(page 901)**
2. The central nervous system consists of the ____________ and the ____________.
3. Is the following sentence true or false? Three layers of connective tissue known as meninges protect the brain and spinal cord. ____________
4. The brain and spinal cord are bathed and protected by ____________.

#### The Brain  
**(pages 902–903)**

<table>
<thead>
<tr>
<th>Part of Brain</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Cerebrum</td>
<td>a. Coordinates and balances the actions of the muscles</td>
</tr>
<tr>
<td>6. Cerebellum</td>
<td>b. Regulates the flow of information between the brain and the rest of the body</td>
</tr>
<tr>
<td>7. Brain stem</td>
<td>c. Controls voluntary activities of the body</td>
</tr>
<tr>
<td>8. Thalamus</td>
<td>d. Controls hunger, thirst, fatigue, anger, and body temperature</td>
</tr>
<tr>
<td>9. Hypothalamus</td>
<td>e. Receives and relays messages from the sense organs</td>
</tr>
</tbody>
</table>

10. The two hemispheres of the brain are connected by a band of tissue called the ____________.

11. Identify the four lobes of the brain.
   a. ____________        c. ____________
   b. ____________        d. ____________

12. Is the following sentence true or false? The left hemisphere of the cerebrum controls the body's left side. ____________

13. Is the following sentence true or false? The outer layer of the cerebrum is called the cerebral cortex. ____________

14. What is gray matter, and where is it found? ____________

#### The Spinal Cord  
**(page 903)**

15. The two regions of the brain stem are the ____________ and the ____________.

16. What is the advantage of a reflex? ____________

#### The Peripheral Nervous System  
**(pages 903–904)**

17. Circle the letter of each choice that is part of the peripheral nervous system.
   a. cranial nerves
   b. spinal nerves
   c. ganglia
   d. spinal cord

18. Complete the concept map.

![Peripheral Nervous System Diagram]

**Peripherals Nervous System**

<table>
<thead>
<tr>
<th>Somatic Nervous System</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Beating of the heart</td>
</tr>
<tr>
<td></td>
<td>b. Lifting a finger</td>
</tr>
<tr>
<td></td>
<td>c. Wiggling the toes</td>
</tr>
<tr>
<td></td>
<td>d. Pulling foot away from tack</td>
</tr>
</tbody>
</table>

19. Circle the letter of each activity that is controlled by the somatic nervous system.
   a. ____________        c. ____________
   b. ____________        d. ____________

20. What does the autonomic nervous system regulate? ____________

21. Why is it important to have two systems that control the same organs? ____________