

The nervous system

[Science](#), [Anatomy](#)



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Multiple Choice

1. The basic types of tissue in the human body are	a.	cell, organ, and organ system.	b.	sight, smell, and hearing.	c.	thyroid, trachea, adenoid, and bronchus.	d.	muscl nervo conne and epithe
2. Which system regulates and controls growth, development, and metabolism?	a.	endocrine system	c.	integumentary system	b.	lymphatic system	d.	skelet system

3. The levels of organization in the body include	a.	endocrine, respiratory, digestive, and nervous.	b.	cells, tissues, organs, and organ systems.	c.	cells, tissues, and functions.	d.	lymph respiratory and circula
4. How many organ systems make up the human body?	a.	4	c.	8	b.	5	d.	11
5. A group of similar cells that perform a single function is called a(an)	a.	nerve.	c.	tissue.	b.	organ.	d.	organ system
6. Which type of tissue lines your internal organs?	a.	epithelial	c.	nerve	b.	connective	d.	muscl

<p>7. Which type of tissue enables a person's fingers to move as he or she plays the piano?</p>	a.	epithelial	c.	nerve	b.	connective	d.	muscl
<p>8. Which type of tissue provides support for the body?</p>	a.	epithelial	c.	nerve	b.	connective	d.	muscl
<p>9. The process by which organ systems maintain relatively constant internal conditions is called</p>	a.	circulation.	c.	homeostasi s.	b.	organization.	d.	teamv
<p>10. Which process enables the body to maintain a</p>	a.	heating	c.	feedback inhibition	b.	circulation	d.	cellula activit

<p>stable temperature?</p>							
<p>11. The level of chemicals in the body that speed up cellular activity is regulated by</p>	<p>a.</p>	<p>action potential.</p>	<p>c.</p>	<p>the sympathetic nervous system.</p>	<p>b.</p>	<p>feedback inhibition.</p>	<p>d. the parasympathetic nervous system.</p>
<p>12. Which system coordinates the body's response to changes in its internal and external environment?</p>	<p>a.</p>	<p>lymphatic system</p>	<p>c.</p>	<p>excretory system</p>	<p>b.</p>	<p>nervous system</p>	<p>d. reproductive system.</p>
<p>13. Neurons are classified by the</p>	<p>a.</p>	<p>direction in which they carry impulses.</p>	<p>b.</p>	<p>amount of metabolic activity that takes place.</p>	<p>c.</p>	<p>number of dendrites that branch out.</p>	<p>d. number of impulses that they carry.</p>

14. What is the smallest structural and functional unit of the nervous system?	a.	nerve	c.	organ	b.	neuron	d.	tissue
15. What begins when a neuron is stimulated by another neuron or by the environment?	a.	a threshold	c.	an impulse	b.	an action potential	d.	a dendrite
16. What is the function of neurotransmitters?	a.	to transmit nerve impulses through dendrites	b.	to stimulate the production of epinephrine	c.	to transmit nerve impulses across synapses	d.	none of the above
17. For a neuron to reach an action potential, it must	a.	release electrons.	b.	absorb calcium.	c.	reverse the electrical charge across the cell membrane.	d.	take in sodium ions.

<p>18. Refer to Figure 35-1. The cell body of a neuron collects information from which structure?</p>	<p>a. A</p>		<p>c. C</p>	<p>b. B</p>	<p>d. E</p>
<p>19. When an impulse reaches the end of a neuron, it triggers the release of</p>	<p>a. neurotransmitters.</p>		<p>c. dendrites.</p>	<p>b. sodium ions.</p>	<p>d. receptors.</p>
<p>20. What is the function of the central nervous system?</p>	<p>a. to relay messages</p>		<p>c. to analyze information</p>	<p>b. to process information</p>	<p>d. all of the above</p>
<p>21. Which of the following is a function of the cerebrum?</p>	<p>a. controls conscious activities of the body</p>		<p>b. controls heart rate</p>	<p>c. controls blood pressure</p>	<p>d. controls breathing</p>

22. The region of the brain that recognizes hunger is the	a. brain stem.	c. hypothalamus.	b. medulla oblongata.	d.			ANS: C AREF: 9030E 3. 1
23. The ability to move your right hand is controlled by the	a. left hemisphere of the cerebrum.	b. right hemisphere of the cerebrum.	c. both the left and right hemispheres of the cerebrum.	d.			neithe hemis of the cerebr
24. A student's ability to think about a question and answer it correctly is directly controlled by the	a. brain stem.	c. medulla.	b. cerebellum.	d.			cerebr
25. Which division(s) of the peripheral	a. sensory division	c. sensory and motor	b. motor division	d.			spinal divisio

<p>nervous system transmit(s) impulses from sense organs to the central nervous system?</p>			<p>divisions</p>			
<p>26. Which division of the nervous system controls the ability to dance?</p>	<p>a. somatic</p>		<p>c. central</p>	<p>b. autonomic</p>	<p>d. brain</p>	
<p>27. The division of the nervous system that helps the body react to pain is the</p>	<p>a. somatic nervous system.</p>		<p>c. autonomic nervous system.</p>	<p>b. sensory nervous system.</p>	<p>d. sympathetic nervous system.</p>	
<p>28. Sense organs are part of the</p>	<p>a. peripheral nervous system.</p>		<p>c. autonomic nervous system.</p>	<p>b. central nervous system.</p>	<p>d. parasympathetic nervous system.</p>	

<p>29. What are the two divisions of the peripheral nervous system?</p>	<p>a.</p>	<p>brain and spinal cord</p>	<p>c.</p>	<p>somatic and autonomic</p>	<p>b.</p>	<p>thalamus and hypothalamus</p>	<p>d.</p>	<p>sensory and motor</p>
<p>30. Which of the following general categories of sensory receptors are located everywhere in the body except the brain?</p>	<p>a.</p>	<p>thermoreceptors</p>	<p>c.</p>	<p>photoreceptors</p>	<p>b.</p>	<p>mechanoreceptors</p>	<p>d.</p>	<p>pain receptors</p>
<p>31. Which general category of sensory receptors detects variations in</p>	<p>a.</p>	<p>thermoreceptors</p>	<p>c.</p>	<p>photoreceptors</p>	<p>b.</p>	<p>mechanoreceptors</p>	<p>d.</p>	<p>pain receptors</p>

temperature?								
32. Sensory receptors that are sensitive to chemicals are found in the	a.	skin, body core, and hypothalamus	c.	eyes.	b.	skin, skeletal muscles, and inner ears.	d.	nose and taste
33. Which of the five senses contains two types of photoreceptors called rods and cones?	a.	vision	c.	smell	b.	hearing	d.	taste
34. In which of the following structures might an infection cause dizziness?	a.	semicircular canals	c.	eardrum	b.	oval window	d.	cochlea
35. Which labeled	a.	structure A	c.	structure C	b.	structure B	d.	structure D

<p>structure in Figure 35-2 creates pressure waves in the cochlea?</p>								
<p>36. In Figure 35-2, which labeled structure sends impulses to the brain that enables it to determine body motion and position?</p>	<p>a. structure A</p>	<p>c. structure C</p>	<p>b. structure B</p>	<p>d. structure D</p>				
<p>37. Which sense relies on the largest sense organ in the body?</p>	<p>a. touch</p>	<p>c. smell</p>	<p>b. hearing</p>	<p>d. taste</p>				
<p>38. If you did not like the flavor of a certain oral</p>	<p>a. closing your eyes.</p>	<p>c. holding your nose.</p>	<p>b. covering your ears.</p>	<p>d. folding hands together.</p>				

<p>liquid medicine, you could hide much of its taste by</p>					
<p>39. Drugs that increase heart rate, blood pressure, and breathing rate are called</p>	<p>a. stimulants.</p>		<p>c. opiates.</p>	<p>b. depressants.</p>	<p>d. alcohol.</p>
<p>40. What types of drugs slow down the activity of the central nervous system?</p>	<p>a. stimulants</p>		<p>c. opiates</p>	<p>b. depressants</p>	<p>d. cocaine</p>
<p>41. Uncontrollable pain and sickness occur because the body cannot produce enough</p>	<p>a. opiates.</p>		<p>c. crack.</p>	<p>b. cocaine.</p>	<p>d. marijuana</p>

endorphins when a drug user attempts to stop using							
42. The most widely abused legal drug is	a. marijuana.	c. amphetami nes.	b. tranquilizers.	d. alcohol			
43. What system does alcohol immediately affect?	a. digestive	c. nervous	b. circulatory	d. endoc			
44. Alcohol does each of the following EXCEPT	a. slow reflexes.	c. impair judgment.	b. stimulate heart rate.	d. disrupt coordi			
45. One-third of all homicides can be	a. alcohol.	c. crack.	b. cocaine.	d. opiate			

attributed to the effects of									
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Modified True/False

1. There are four levels of organization in the human body: cells, tissues, organs, and organ systems. _____ ANS: TDIF: AREF: p. 891 OBJ: 35. 1. 1
2. A group of similar cells that perform a single function is called a(an) organ. _____ ANS: F, tissue DIF: BREF: p. 891OBJ: 35. 1. 1
3. The hypothalamus is to your body as the thermostat is to the internal environment of a house. _____ ANS: TDIF: EREF: p. 896 OBJ: 35. 1. 2
4. Spreading out from the cell body of a neuron are short, branched extensions called axons. _____ ANS: F, dendrites DIF: BREF: p. 898OBJ: 35. 2. 1
5. The propagation of an action potential is slower in myelinated axons than in axons that lack a myelin sheath. _____ ANS: F, faster DIF: EREF: p. 898OBJ: 35. 2. 2
6. The largest and most prominent region of the human brain that is responsible for the voluntary, or conscious, activities of the body is the cerebellum. _____ ANS: F, cerebrum DIF: BREF: p. 902OBJ: 35. 3. 1

7. The brain and spinal cord can withstand considerable trauma due to the meninges acting as a shock absorber. _____ ANS: F, cerebrospinal fluid DIF: AREF: p. 901OBJ: 35. 3. 1
8. If you accidentally step on a tack with your bare foot, the pathway that the nerve impulse takes from your foot to your leg is called a reflex arc. _____ ANS: TDIF: BREF: p. 904 OBJ: 35. 3. 2
9. The autonomic nervous system is part of the motor division of the peripheral nervous system. _____ ANS: TDIF: AREF: p. 904 OBJ: 35. 3. 2
10. Chemoreceptors are associated with the sense of smell and touch. _____ ANS: F, taste DIF: AREF: p. 909OBJ: 35. 4. 1
11. Rods respond to light of different colors, producing color vision. _____ ANS: F, Cones DIF: EREF: p. 907OBJ: 35. 4. 2
12. A person with a relatively small number of cones in the retinas may have trouble distinguishing colors. _____ ANS: TDIF: EREF: p. 907 OBJ: 35. 4. 2
13. The cochlea and the two tiny sacs located behind it help the body maintain its equilibrium. _____ ANS: F, semicircular canals DIF: EREF: p. 908OBJ: 35. 4. 2
14. Addiction can be defined as intentional misuse of any drug for nonmedical purposes. _____ ANS: F, Drug abuseDIF: AREF: p. 914OBJ: 35. 5. 1

15. About 40 percent of the fatal accidents that occur on Americans highways involve the drug alcohol. _____ ANS: TDIF: BREF: p. 912 OBJ: 35. 5. 2

Completion

1. Your skin, hair, nails, and sweat and oil glands make up your _____ system. ANS: integumentary DIF: EREF: p. 892OBJ: 35. 1. 1STO: 12. A. 4. b

2. Neurons are classified into three types according to the _____ the impulse travels. ANS: direction DIF: AREF: p. 97OBJ: 35. 2. 1

3. The process by which a stimulus produces a response that opposes the original stimulus is called _____ inhibition. ANS: feedback DIF: BREF: p. 895OBJ: 35. 1. 2

4. _____ is the process by which organisms maintain a relatively stable internal environment. ANS: Homeostasis DIF: AREF: p. 895OBJ: 35. 1. 2

5. In most animals, axons and dendrites are clustered into bundles of fibers called _____. ANS: nerves DIF: AREF: p. 898OBJ: 35. 2. 1

6. Sensory neurons and motor neurons are connected by _____, which carry impulses between them. ANS: interneurons DIF: BREF: p. 897OBJ: 35. 2. 1

7. The myelin sheath that surrounds a single long axon leaves many gaps, called _____, where the axon membrane is exposed. ANS: nodes DIF: AREF: p. 898OBJ: 35. 2. 1
8. The difference in electrical charge across the cell membrane of a resting neuron is its resting _____. ANS: potential DIF: AREF: p. 898OBJ: 35. 2. 2
9. The two major divisions of the human nervous system are the central and the _____ nervous systems. ANS: peripheral DIF: BREF: p. 901OBJ: 35. 3. 1 Figure 35-3
10. The process illustrated in Figure 35-3 is called a(an) _____. ANS: reflex arc DIF: EREF: p. 904OBJ: 35. 3. 2
11. The turning of your head is controlled by the _____ nervous system, which is part of the peripheral nervous system's motor division. ANS: somatic DIF: EREF: p. 903OBJ: 35. 3. 2
12. Sensory receptors called _____ are found in the skin, skeletal muscles, and inner ears and are sensitive to touch, pressure, stretching of muscles, sound, and motion. ANS: mechanoreceptors DIF: BREF: p. 906OBJ: 35. 4. 1
13. Small muscles attached to the _____ of your eye change its shape to help you focus on near or distant objects. ANS: lens DIF: EREF: p. 907OBJ: 35. 4. 2

14. The class of drugs called _____ mimic natural chemicals in the brain known as endorphins, which normally help to overcome sensations of pain. ANS: opiates DIF: EREF: p. 911OBJ: 35. 5. 1

15. Cirrhosis of the liver is a possible result of the long-term use of _____. ANS: alcohol DIF: BREF: p. 913OBJ: 35. 5. 2STO: 11. A. 4. c, 13. A. 4. b

Short Answer

1. Compare and contrast tissues and organs. ANS: A tissue is a group of similar cells that perform a single function. An organ is a group of tissues that work together to perform a complex function. DIF: AREF: p. 891OBJ: 35.

1. 1

2. What is homeostasis? ANS: Homeostasis is the process by which organisms keep internal conditions relatively constant despite changes in external environments. DIF: BREF: p. 895OBJ: 35. 1. 2

3. How can the nervous system help a person run without falling? Explain. ANS: Balance is necessary for running. Portions of the nervous system, along with the sense organs, can interpret a person's balance and make minor corrections to make sure the person will not fall. DIF: EREF: p. 908OBJ: 35. 4.

1

4. Distinguish between the functions of dendrites and axons. ANS: Dendrites and axons are parts of a neuron. Dendrites carry impulses from the environment or from other neurons toward the cell body. Axons carry impulses away from the cell body. DIF: BREF: p. 898OBJ: 35. 2. 2

5. At what location does a neuron transfer an impulse to another cell? ANS: the synapse DIF: AREF: p. 900OBJ: 35. 2. 2 Figure 35-1

6. Identify the structure and its labeled parts illustrated in Figure 35-1. ANS: neuron; (A) dendrite; (B) cell body; (C) axon; (D) myelin sheath; (E) nucleus DIF: EREF: p. 897OBJ: 35. 2. 2

7. What are the major regions of the brain? ANS: The major regions of the brain are the cerebrum, the cerebellum, the brain stem, the thalamus, and the hypothalamus. DIF: BREF: p. 901, p. 902, p. 903OBJ: 35. 3. 1

8. How is the spinal cord like a major telephone line? ANS: The spinal cord is the main communications link between the brain and the rest of the body, transmitting information, just as a telephone line carries many calls at once. DIF: AREF: p. 903OBJ: 35. 3. 1

9. Why is a severe injury to the brain stem usually fatal? ANS: The brain stem controls some of the body's most important functions, including breathing, heartbeat, blood pressure, and swallowing. These involuntary processes are essential to life, so the disruption of any of these processes can cause death. DIF: EREF: p. 902OBJ: 35. 3. 1

10. What is a motor neuron? ANS: A motor neuron carries impulses from the brain and the spinal cord to muscles and glands. DIF: EREF: p. 897OBJ: 35. 2. 1

11. How is a pain in your toe perceived by sensory receptors? Why is it important for your body to sense this pain? ANS: Pain receptors respond to chemicals released by the damaged cells in your toes, which may indicate danger, injury, or disease. DIF: EREF: p. 906OBJ: 35. 4. 1

12. Identify the five main senses. ANS: The five main senses are vision, hearing, smell, taste, and touch. DIF: BREF: p. 906OBJ: 35. 4. 2 13. Compare and contrast the functions of rods and cones. ANS: Both rods and cones are photoreceptors in the retina. Rods are sensitive to light but do not distinguish colors. Cones are less sensitive to light than rods, but cones respond to light of different colors. DIF: AREF: p. 907OBJ: 35. 4. 2 14. How do opiates help people overcome sensations of pain? ANS: Opiates mimic natural chemicals in the brain known as endorphins, which normally help to overcome sensations of pain. DIF: BREF: p. 911OBJ: 35. 5. 1

15. What are the cause and effects of fetal alcohol syndrome? ANS: Fetal alcohol syndrome is caused by consuming alcohol while pregnant. The effect of this syndrome is a range of birth defects in the baby, such as heart defect, malformed face, delayed growth, and poor motor development. DIF: AREF: p. 913OBJ: 35. 5. 2STO: 11. A. 4. c, 13. A. 4. b

Other Using Science Skills

This diagram shows the structure of a synapse between the axon of one neuron and the dendrite of a neighboring neuron. Figure 35-4

1. Applying Concepts In Figure 35-4, which structures release neurotransmitters? ANS: vesicles DIF: AREF: p. 900OBJ: 35. 2.

2. Interpreting Graphics In Figure 35-4, into what area do the neurotransmitters diffuse? ANS: synaptic cleft DIF: AREF: p. 900OBJ: 35. 2. 2

3. Predicting Referring to Figure 35-4, predict the direction of the impulse. ANS: The impulse will travel from the axon to the dendrite of the adjacent neuron. DIF: AREF: p. 900OBJ: 35. 2. 2

4. Applying Concepts Referring to Figure 35-4, after the neurotransmitters are released from the cell surface, what happens to the neurotransmitters?

ANS: The neurotransmitters may be broken down by enzymes, or taken up and recycled by the axon terminal. DIF: AREF: p. 900OBJ: 35. 2. 2

5. Applying Concepts If the axon in Figure 35-4 is part of a motor neuron, to what cells are the impulses being passed? ANS: muscle cells and glands DIF:

AREF: p. 897OBJ: 35. 2. 2

Using Science Skills

Blood alcohol concentration (BAC) is a measure of the amount of alcohol in the bloodstream. The following graphs illustrate how many alcoholic drinks consumed in one hour result in different levels of BAC in individuals of different masses. In some states, an adult driving with a BAC of 0.08% or higher is considered to be legally drunk. Figure 35-5

6. Using Tables and Graphs You have a mass of 45 kg and have had one drink.

According to Figure 35-5, how long would it take for your BAC to drop to 0.04% or lower? ANS: one hour DIF: EREF: p. 912, p. 913OBJ: 35. 5. 2 STO: 11.

A. 4. c, 13. A. 4. b

7. Using Tables and Graphs You are a 48-kg adult and have had four drinks in an hour. According to Figure 35-5, could you drive legally after three hours?

ANS: no DIF: EREF: p. 912OBJ: 35. 5. 2

8. Interpreting Graphics Based on Figure 35-5, how is the mass of an individual related to BAC levels? ANS: Individuals with more mass can

consume more alcoholic drinks in the same period of time and have a lower BAC than individuals with less mass. DIF: EREF: p. 912OBJ: 35. 5. 2

9. Interpreting Graphics A 40-kg person and a 50-kg person each drink 4 drinks in 4 hours. Do they have the same BAC? ANS: No. The 40-kg person has a BAC of 0. 10% or higher, whereas the 50-kg person has a BAC of 0. 05% to 0. 09%. DIF: EREF: p. 912OBJ: 35. 5. 2

10. Applying Concepts A 58-kg person has two cocktails just before dinner and a glass of wine with dinner 30 minutes later. According to Figure 35-5, how long would the individual be in the “ Definitely illegal” category? ANS: one hour DIF: EREF: p. 912OBJ: 35. 5. 2 USINGSCIENCE SKILLS Figure 35-6

11. Interpreting Graphics What is the name of structure C in Figure 35-6? ANS: spinal cord DIF: BREF: p. 901, p. 903OBJ: 35. 3. 1

12. Applying Concepts Referring to Figure 35-6, which structure is responsible for the voluntary, or conscious, activities of the body? ANS: structure A, the cerebrum DIF: BREF: p. 902OBJ: 35. 3. 1

13. Applying Concepts Referring to Figure 35-6, which structure is the control center for recognition and analysis of hunger, thirst, fatigue, anger, and body temperature? ANS: hypothalamus DIF: BREF: p. 903OBJ: 35. 3. 1

14. Interpreting Graphics In Figure 35-6, which structure is the cerebellum? ANS: structure B DIF: BREF: p. 901, p. 902OBJ: 35. 3. 1

15. Applying Concepts Referring to Figure 35-6, what two regions of the brain stem act as neural “ switchboards,” regulating the flow of information

between the brain and the rest of the body? ANS: medulla oblongata and pons DIF: BREF: p. 902OBJ: 35. 3. 1

Essay

1. How are the cells of the human body similar to individuals in a society that work in groups to accomplish shared goals? ANS: Every cell in the human body is both an independent unit and an interdependent part of a larger community—the entire organism.

Similarly, each individual in a society can survive independently, but it is also necessary to form interdependent groups to accomplish certain goals. DIF: EREF: p. 891OBJ: 35. 1. 1

2. Name six of the body's systems and describe their functions. ANS: Answer should include six of the following systems. The nervous system coordinates the body's response to changes in its internal and external environment. The integumentary system serves as a barrier against infection and injury, helps to regulate body temperature, and provides protection against ultraviolet radiation from the sun.

The skeletal system supports the body, protects internal organs, allows movement, stores mineral reserves, and provides a site for blood cell formation. The muscular system works with the skeletal system to provide voluntary movement and helps to circulate blood and move food through the digestive system. The circulatory system brings oxygen, nutrients, and hormones to cells; fights infection; removes cell wastes, and helps regulate body temperature. The respiratory system provides the oxygen needed for cellular respiration and removes excess carbon dioxide from the body.

The digestive system converts foods into simpler molecules that can be used by the cells of the body. The excretory system eliminates waste products from the body. The endocrine system controls growth, development, and metabolism. The reproductive system produces reproductive cells and, in the female, nurtures and protects the developing embryo. The lymphatic system helps protect the body from disease, collects fluid lost from blood vessels, and returns the fluid to the circulatory system. DIF: EREF: p. 892, p. 893OBJ: 35. 1. 1 STO: 12. A. 4. b

3. Based on the process of feedback inhibition, explain how your body maintains a relatively constant temperature. ANS: The hypothalamus contains nerve cells that monitor both the temperature of your skin at the surface of the body and the temperature of organs in the body's core. When these nerve cells sense that the body's temperature is lower than normal, the hypothalamus produces chemicals that signal cells throughout the body to speed up their activities. The heat produced by this increase in cellular activity causes a gradual rise in body temperature, which is detected by the nerve cells in the hypothalamus.

This feedback inhibits the production of chemicals that speed up cellular activity and keeps body temperature from rising to a dangerous level. If your body temperature rises too far above normal, the hypothalamus slows down cellular activities, minimizing the production of heat. DIF: EREF: p. 895OBJ: 35. 1. 2

4. Compare resting potential and action potential in a neuron. ANS: The difference in electrical charge across the cell membrane of a resting neuron

is the resting potential. Once an impulse begins, positive ions rush across the cell membrane, reversing the charge difference.

The inside of the membrane gains a positive charge, and the outside of the membrane gains a negative charge. This rapid reversal of charges is called the action potential. As the impulse passes, the positively charged ions flow out of the cell, and the resting potential of the membrane is reestablished.

DIF: AREF: p. 898, p. 899OBJ: 35. 2. 2

5. What is the function of each of the main regions of the brain? ANS: The cerebrum controls voluntary activities, intelligence, learning, and judgment. The cerebellum controls coordination and balance.

The brain stem controls blood pressure, heart rate, breathing, and swallowing. The thalamus receives messages from the sense organs. The hypothalamus recognizes sensations of hunger, thirst, fatigue, anger, and body temperature. DIF: AREF: p. 902, p. 903OBJ: 35. 3. 1

6. Compare the effects of the sympathetic and the parasympathetic divisions of the autonomic nervous system. ANS: The sympathetic nervous system and the parasympathetic nervous system each release different neurotransmitters that have opposite effects on the same organ system, which helps the body maintain homeostasis.

When the sympathetic system speeds up an activity, the parasympathetic system slows down the same activity. For example, the heart rate is increased by the sympathetic nervous system but decreased by the parasympathetic nervous system. DIF: AREF: p. 904OBJ: 35. 3. 2

7. What are the five general categories of sensory receptors? Where are they located in the body? ANS: The five general categories are pain receptors, thermoreceptors, mechanoreceptors, chemoreceptors, and photoreceptors. Pain receptors are throughout the body except in the brain.

Thermoreceptors are located in the skin, body core, and hypothalamus. Mechanoreceptors are found in skin, skeletal muscles, and inner ears. Chemoreceptors are found in the nose and taste buds. Photoreceptors are found in the eyes. DIF: AREF: p. 906OBJ: 35. 4. 1

8. How would you design an experiment to show that much of what people actually taste in food depends on their sense of smell? ANS: Students' experiments may include having someone taste different types of foods that have specific tastes and smells, and then having the person taste them with his or her eyes shut and nose held closed.

Students should determine if the person can identify the food that he or she tasted without the use of sight and smell, and record observations and draw conclusions. DIF: EREF: p. 909OBJ: 35. 4. 2

9. People who have to drive long distances sometimes take stimulants. How might this practice be dangerous? ANS: Stimulants increase the release of neurotransmitters at some synapses in the brain, which then leads to a feeling of energy and well-being. However, when the effects of the stimulants wear off, the brain's supply of neurotransmitters has been depleted.

The user quickly falls into fatigue and depression, which can impair the person's ability to drive and could lead to accidents. DIF: AREF: p. 910OBJ: 35. 5. 1

10. In the Designated Driver Program, one person in a group agrees to be the driver and not to drink any alcohol. Why is this program important? ANS: By decreasing the number of drunk drivers on the road, you decrease your chances of being involved in such an accident. If more people were involved in the Designated Driver Program, fewer people would be in danger of being involved in a fatal accident. DIF: EREF: p. 912OBJ: 35. 5. 2