CHAPTER 33 Assessment

Section 33.1

Vocabulary Review

For each set of terms below, choose the one term that does not belong and explain why it does not belong.

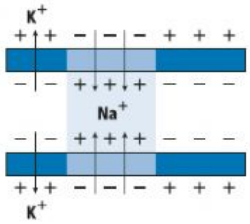
1. axon—dendrite—reflex arc

2. cell body—synapse—neurotransmitter

3. myelin—node—threshold

Understand Key Concepts

Use the diagram below to answer question 4.



4. What is occurring in the diagram above?
- **A.** K^+ ions are entering the neuron.
- **B.** Negatively charged proteins are leaving the neuron.
- **C.** Na^+ ions are entering the neuron.
- **D.** The myelin coat has broken down, allowing ions to freely cross the plasma membrane.

5. Which is the correct path a nerve impulse will follow in a reflex arc?
- **A.** motor neuron → interneuron → sensory neuron
- **B.** interneuron → motor neuron → sensory neuron
- **C.** motor neuron → sensory neuron → interneuron
- **D.** sensory neuron → interneuron → motor neuron

Constructed Response

6. Short Answer Hypothesize why it takes more energy for a nerve impulse to travel an axon that lacks myelin as opposed to an axon that has myelin.

7. Short Answer Explain the following analogy: A neuron is like a one-way street, while a nerve is like a two-way street.

Think Critically

8. Infer In most animals, an action potential will travel only in one direction along a neuron. Infer what the result might be in humans if nerve impulses could travel in both directions on a single neuron.

Section 33.2

Vocabulary Review

For each set of terms below, choose the one term that does not belong and explain why it does not belong.

9. somatic system—parasympathetic system—sympathetic system

10. cerebrum—pons—medulla oblongata

11. autonomic nervous system—somatic nervous system—central nervous system

Understand Key Concepts

12. Which is characteristic of the sympathetic division of the autonomic system?
- **A.** stimulates digestion
- **B.** dilates the bronchi
- **C.** slows the heart rate
- **D.** converts glucose to glycogen

Use the diagram below to answer question 13.

13. If the portion indicated by the arrow was damaged due to trauma, what effects would this person most likely experience?
- **A.** partial or complete memory loss
- **B.** body temperature fluctuations
- **C.** trouble maintaining balance
- **D.** rapid breathing

14. Which nervous system is the hypothalamus most involved in regulating?
- **A.** voluntary
- **B.** peripheral
- **C.** sensory
- **D.** autonomic

Constructed Response

15. Open Ended Suppose you are on the debate team at school. You must support the following statement: The autonomic nervous system is more involved with homeostasis than the somatic nervous system. Build your case.

Think Critically

16. Critique You might have heard the statement "humans use only ten percent of their brains." Use the Internet or other sources to compile evidence that either supports or refutes this idea.

17. Analyze The human cerebrum is disproportionately large compared to the cerebrum of other animals. What advantage does this give to humans?

Section 33.3

Vocabulary Review

Distinguish between the terms in each of the following sets:

18. rods—cones

19. cochlea—semicircular canals

20. retina—taste buds

Understand Key Concepts

21. If there were a power outage in a movie theater and only a few dim emergency lights were lit, which cells of the retina would be most important for seeing your way to the exit?

A. rods
B. cones
C. Rods and cones are equally important.

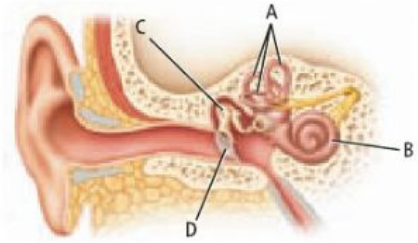
22. Which represents the correct sequence as sound waves travel in the ear to trigger an impulse?

A. cochlea, incus, stape, eardrum
B. tympanum, bones in the middle ear, cochlea, hair cells
C. auditory canal, tympanum, hair cells, cochlea
D. hair cells, auditory canal, cochlea, malleus

23. With which sense are free nerve endings associated?

A. taste **C.** touch
B. hearing **D.** sight

Use the diagram below to answer question 24.



24. Some rides at amusement parks cause a person to become dizzy when the ride stops. Which structure in the diagram is most likely involved with the dizzy feeling?

A. A **C.** C
B. B **D.** D

Constructed Response

25. Open Ended A rare condition exists in which a person cannot feel pain. Is this desirable or undesirable? Explain your response.

Think Critically

26. Explain You have receptors for light (soft) touch all over your body. In terms of what you know about the nervous system, why are you not always conscious of things like wearing clothes or a wristwatch?

27. Categorize Rate the senses from 1 to 5 in order of importance (with 1 representing the most important.) Be prepared to debate this issue with other students in the class.

Section 33.4

Vocabulary Review

Explain the difference between the terms in each set. Then explain how the terms are related.

28. stimulants—depressants

29. tolerance—addiction

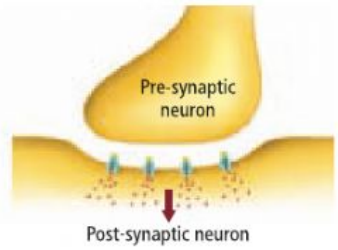
30. dopamine—drug

Understand Key Concepts

31. Which of the following decreases brain activity?
- **A.** nicotine
- **B.** amphetamines
- **C.** cocaine
- **D.** alcohol

32. What is the most likely function of amphetamines?
- **A.** to stimulate the sympathetic nervous system
- **B.** to stimulate the parasympathetic nervous system
- **C.** to stimulate the sympathetic and parasympathetic systems equally
- **D.** do not affect either the sympathetic or parasympathetic nervous system

Use the diagram below to answer question 33.



33. If a person is suffering from depression, which drug is one recommended treatment of the pre-synaptic neuron?
- **A.** one that increases the re-uptake of dopamine.
- **B.** one that increases the production of dopamine
- **C.** one that decreases the receptors for dopamine
- **D.** one that decreases the re-uptake of dopamine

Constructed Response

34. Short Answer What does it mean when someone is addicted to a drug?

35. Open Ended Discuss what consequences might arise if a person's gene for the production of dopamine was defective.

Think Critically

36. Defend Form a conclusion about the following statement: "It is more difficult for someone to get addicted to drugs than it is to stop using drugs." Defend your position.

Additional Assessment

37. WRITING in Biology Write a short story about a person who heard a loud noise and became afraid. Include in your story events that might occur in each division of the nervous system during such an experience.

Document-Based Questions

Data obtained from: Blinkov, S.M., and Glezer, I.I. 1968. *The human brain in figures and tables: a quantitative handbook*. New York: Plenum Press.
Nieuwenhuys, R., Ten Donkelaar, H.J., and Nicholson, C. 1998. *The central nervous system of vertebrates*. Vol. 3. Berlin: Springer.
Berta, A., et al. 1999. *Marine mammals: evolutionary biology*. San Diego: Academic Press.

Average Brain Weights (in grams)

Species	Weight (g)	Species	Weight (g)
Fin whale	6930	Dog (beagle)	72
Elephant	6000	Cat	30
Cow	425–458	Turtle	0.3–0.7
Adult human	1300–1400	Rat	2

38. Does there appear to be a correlation between body size and brain weight?

39. Discuss possible explanations (in terms of adaptations) that would account for your response to question 38.

Cumulative Review

40. Evaluate the role of fungi on Earth. **(Chapter 20)**

41. Examine the adaptations that have made arthropods the most evolutionarily successful animals. **(Chapter 26)**

42. Make an argument for or against the following statement: The skin should be considered an organ rather than a tissue. **(Chapter 32)**

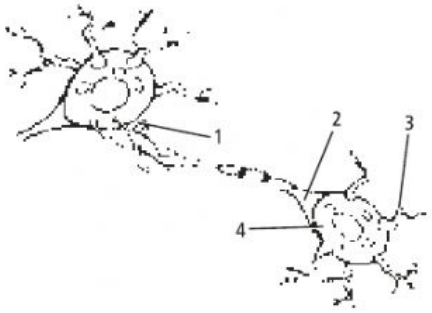
Standards Practice for the EOCT

Cumulative

Multiple Choice

1. Which characteristic is unique to mammals?
   - **A.** hair
   - **B.** endothermy
   - **C.** four-chambered heart
   - **D.** internal fertilization

Use the diagram below to answer questions 2 and 3.



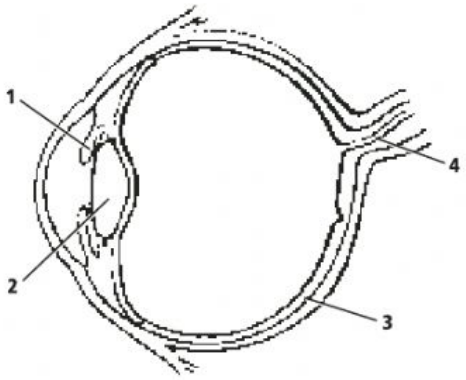
2. In which part of the diagram above would you expect to find myelin?
   - **A.** 1
   - **B.** 2
   - **C.** 3
   - **D.** 4

3. In which part of the diagram above would you expect to find neurotransmitters when an action potential reaches the end of the neuron?
   - **A.** 1
   - **B.** 2
   - **C.** 3
   - **D.** 4

4. What is the purpose of the epithelial tissue in the integumentary system?
   - **A.** cover the body surface and protect its tissues
   - **B.** move joints and bones
   - **C.** provide a structural framework for the body
   - **D.** transmit nerve signals

5. Which animal is a placental mammal?
   - **A.** hummingbird
   - **B.** kangaroo
   - **C.** duck-billed platypus
   - **D.** whale

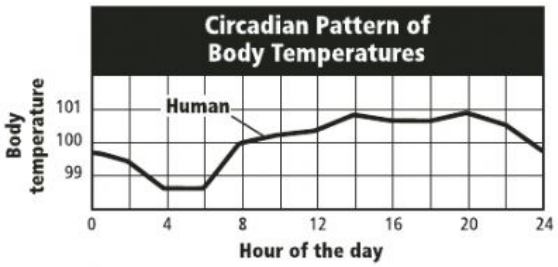
Use the diagram below to answer questions 6 and 7.



6. Which part of the eye is made of muscles that respond to stimuli?
   - **A.** 1
   - **B.** 2
   - **C.** 3
   - **D.** 4

7. If a person cannot see certain colors, what part of the eye might be damaged?
   - **A.** 1
   - **B.** 2
   - **C.** 3
   - **D.** 4

Use the graph below to answer question 8.



8. The graph above shows the circadian pattern of body temperature in humans. When does the body temperature of humans seem to be the lowest?
   - **A.** after eating
   - **B.** in the afternoon
   - **C.** just before dawn
   - **D.** late at night