

15. In an electrical synapse, neurotransmitter molecules are released by a presynaptic neuron, diffuse across a narrow synaptic cleft, and bind to receptors in the plasma membrane of a postsynaptic cell. (11.2) K/U
 16. Octopamine is a neurotransmitter that is known to be involved in the feeding activity of insects. (11.2) K/U
 17. Cerebrospinal fluid allows only selected substances to enter the blood–brain barrier. (11.3) K/U
 18. The thalamus receives, filters, and relays sensory and motor information. (11.3) K/U
 19. The autonomic system is mainly conscious and voluntary. (11.4) K/U
 20. The 31 pairs of cranial nerves transmit motor, sensory, and autonomic signals between the spinal cord and the rest of the body. (11.4) K/U
 21. In the auditory system, photoreceptors detect light at particular wavelengths and convert the stimuli to nerve impulses. (11.5) K/U
 22. We usually think of the five senses but, in reality, there are nearly twice as many sensory abilities involved in homeostasis. (11.5) K/U
 23. Everyone experiences stress in the same way. (11.6) K/U
 24. Prostaglandins are secreted as part of the stress response, and at least one prostaglandin is involved in a feedback loop with ACTH during the stress response. (11.6) K/U
26. (a) action potential (i) voltage difference across a nerve cell membrane of an unstimulated neuron; usually negative
 - (b) membrane potential (ii) potential at which an action potential is generated by a neuron
 - (c) resting potential (iii) voltage difference across a nerve cell membrane when the nerve is excited
 - (d) threshold potential (iv) period in which the threshold that is required for the generation of an action potential is much higher than normal
 - (e) refractory period (v) electrical potential of a membrane, which results from an imbalance of charge on either side of the membrane (11.2) K/U

Match each term on the left with the most appropriate description on the right.

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|---|---|
| <ol style="list-style-type: none"> 25. (a) parasympathetic division (b) autonomic system (c) central nervous system (CNS) (d) peripheral nervous system (PNS) (e) sympathetic division | <ol style="list-style-type: none"> (i) subdivision of the efferent system, within the peripheral nervous system; regulates the internal environment (ii) coordinating centre for mechanical and chemical actions in the body; made up of the brain and spinal cord (iii) part of the body that generally increases energy consumption and prepares the body for action (iv) all the parts of the nervous system, excluding the brain and spinal cord, that relay information between the CNS and other parts of the body (v) part of the body that stimulates activities involved in acquiring and conserving energy (11.1) K/U |
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27. List the components of a neural signalling pathway in the order they occur. (11.1) K/U
 28. In your notebook, complete the following description of a reflex arc by filling in the missing words:
Your finger touches a hot pot on a stove. Information is carried via the _____ neurons to the _____ in the spinal cord, which relay the information via the _____ neurons to the effector, which responds. (11.1) K/U
 29. What allows the myelin sheath to act as an electrical insulator? (11.1) K/U
 30. What are the nodes of Ranvier, and what is their function? (11.1) K/U
 31. What structure is found only in electrical synapses, not in chemical synapses? (11.2) K/U
 32. Why does a neuron plasma membrane need a refractory period? (11.2) K/U
 33. (a) What is the threshold potential (in mV)?
(b) When the threshold potential is reached, what happens to the Na⁺ channels? (11.2) K/U
 34. What are the effects of the degeneration of acetylcholine-releasing neurons in people who have Alzheimer's disease? (11.2) K/U
 35. What is the difference between white matter and grey matter? (11.3) K/U
 36. Name the four lobes of the cerebral cortex. (11.3) K/U
 37. Explain the purpose of the blood–brain barrier. (11.3) K/U

Write a short answer to each question.

38. Compare the function of the sympathetic division of the autonomic nervous system with the function of the parasympathetic division. (11.4) K/U
39. What is pain? (11.4) K/U
40. What are endorphins? (11.4) K/U
41. What is echolocation, and when is it useful? (11.5) K/U
42. What is the function of the Eustachian tube? (11.5) K/U
43. Name and explain the negative feedback pathway that attempts to maintain blood pressure if an injury results in a loss of blood. (11.6) K/U
44. How does epinephrine stop anaphylactic shock? (11.6) K/U

Understanding

45. Identify the three neurons that are involved in a reflex arc. List these neurons in the order they are used to complete the reflex arc. (11.1) K/U
46. Compare afferent neurons and efferent neurons. (11.1) K/U
47. What causes a membrane potential? (11.2) K/U
48. Use **Figure 1** to answer the following questions. (11.2) K/U

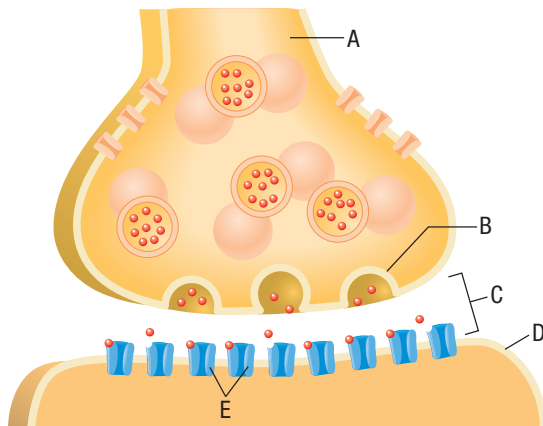


Figure 1

- (a) Is this a chemical synapse or an electrical synapse? What structure (either present or absent) tells you which type of synapse it is?
 - (b) In this synapse, which structure represents the synaptic cleft?
 - (c) In this synapse, which structure represents the axon terminal of a presynaptic cell?
 - (d) What is happening in structure B?
 - (e) In structure D, neurotransmitter molecules diffuse across the cleft and bind to receptors in the plasma membrane of the postsynaptic cell. What happens next?
49. Distinguish between the central nervous system and the peripheral nervous system. (11.3, 11.4) K/U

50. How is the cerebrum anatomically divided? (11.3) K/U
51. Use **Figure 2** to answer the following questions. (11.5) K/U

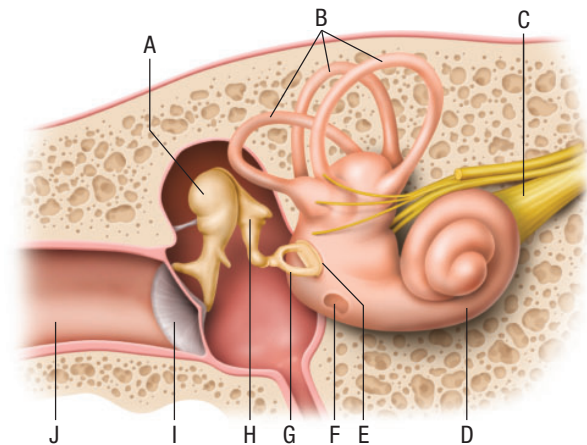


Figure 2

- (a) Which letter identifies the tympanic membrane?
 - (b) Which letter identifies the structure that vibrates and directly creates the pressure waves in the fluid in the cochlea?
 - (c) Which letter identifies the structure that transmits auditory signals to the brain?
52. (a) What natural pain suppression system does the CNS have?
- (b) How does this pain suppression system work? (11.5) K/U

Analysis and Application

53. During a physical examination, a doctor taps the side of a patient's knee with a small rubber hammer. (11.1) K/U T/I
- (a) Explain what the doctor is testing.
 - (b) Describe the neural circuit that is involved.
54. Neurons can excite 200 to 1600 times per second, and an impulse can travel at up to 400 km/h. What physical characteristics would the axon of a neuron need for the action propagation to be the fastest possible? (11.1) K/U T/I
55. A toxin interferes with the opening of the Na^+ channels in the postsynaptic membrane, causing them to open more slowly when bound to a neurotransmitter. What would be the effect on formation of an action potential in the postsynaptic membrane? (11.2) K/U T/I
56. One effect of alcohol is to make the person consuming it feel slow and sluggish. It does this by affecting two important neurotransmitters. Which neurotransmitters are these likely to be, and how do they slow the body's reaction to stimuli? (11.2) K/U T/I