

1. The axons of certain neurons are covered by a layer of fatty tissue that helps speed neural transmission. This tissue is:

- a. the glia.
- b. the myelin sheath.
- c. acetylcholine.
- d. an endorphin.

2. Heartbeat, digestion, and other self-regulating bodily functions are governed by the:

- a. voluntary nervous system.
- b. autonomic nervous system.
- c. sympathetic division of the autonomic nervous system.
- d. somatic nervous system.

3. A strong stimulus can increase the:

- a. speed of the impulse the neuron fires.
- b. intensity of the impulse the neuron fires.
- c. number of times the neuron fires.
- d. threshold that must be reached before the neuron fires.

4. The pain of heroin withdrawal may be attributable to the fact that:

- a. under the influence of heroin the brain ceases production of endorphins.
- b. under the influence of heroin the brain ceases production of all neurotransmitters.
- c. during heroin withdrawal the brain's production of all neurotransmitters is greatly increased.
- d. heroin destroys endorphin receptors in the brain.

5. The brain research technique that involves monitoring the brain's usage of glucose is called (in abbreviated form) the:

- a. PET scan.
- b. fMRI.
- c. EEG.
- d. MRI.

6. In a resting state, the axon is:

- a. depolarized, with mostly negatively charged ions outside and positively charged ions inside.
- b. depolarized, with mostly positively charged ions outside and negatively charged ions inside.
- c. polarized, with mostly negatively charged ions outside and positively charged ions inside.
- d. polarized, with mostly positively charged ions outside and negatively charged ions inside.

7. Though there is no single "control center" for emotions, their regulation is primarily attributed to the brain region known as the:

- a. limbic system.
- b. reticular formation.
- c. brainstem.
- d. cerebellum.

8. Which is the correct sequence in the transmission of a simple reflex?

- a. sensory neuron → interneuron → sensory neuron
- b. interneuron → motor neuron → sensory neuron
- c. sensory neuron → interneuron → motor neuron
- d. interneuron → sensory neuron → motor neuron

9. Damage to \_\_\_\_\_ will usually cause a person to lose the ability to comprehend language.

- a. the angular gyrus
- b. Broca's area
- c. Wernicke's area
- d. frontal lobe association areas

10. Which of the following is typically controlled by the right hemisphere?

- a. language
- b. learned voluntary movements
- c. arithmetic reasoning
- d. perceptual tasks

11. Dr. Hernandez is studying neurotransmitter abnormalities in depressed patients. She would most likely describe herself as a:

- a. personality psychologist.
- b. phrenologist.
- c. psychoanalyst.
- d. biological psychologist.

12. The increasing complexity of animals' behavior is accompanied by a(n):

- a. increase in the size of the brainstem.
- b. decrease in the ratio of brain to body weight.
- c. increase in the size of the frontal lobes.
- d. increase in the amount of association area.

13. Voluntary movements, such as writing with a pencil, are directed by the:

- a. sympathetic nervous system.
- b. somatic nervous system.
- c. parasympathetic nervous system.
- d. autonomic nervous system.

14. A neuron will generate action potentials more often when it:

- a. remains below its threshold.
- b. receives an excitatory input.
- c. receives more excitatory than inhibitory inputs.
- d. is stimulated by a neurotransmitter.

15. Which is the correct sequence in the transmission of a neural impulse?

- a. axon -> dendrite -> cell body -> synapse
- b. dendrite-taxon -> cell body -> synapse
- c. synapse -> axon -> dendrite -> cell body
- d. dendrite -> cell body-taxon -> synapse

16. Chemical messengers produced by endocrine glands are called:

- a. agonists.                      c. hormones.
- b. neurotransmitters.        d. enzymes.

17. Following a head injury, a person has ongoing difficulties staying awake. Most likely, the damage occurred to the:

- a. thalamus.                      c. reticular formation.
- b. corpus callosum.            d. cerebellum.

18. (Thinking Critically) Based on research, which of the following seems true about the specialized functions of the right and left hemispheres?

- a. They are more clear-cut in men than in women.
- b. They are more clear-cut in women than in men.
- c. Most complex tasks emerge from the activity of one or the other hemisphere.
- d. Most complex activities emerge from the integrated activity of both hemispheres.

19. Cortical areas that are not primarily concerned with sensory, motor, or language functions are:

- a. called projection areas.
- b. called association areas.
- c. located mostly in the parietal lobe.
- d. located mostly in the temporal lobe.

20. In the brain, learning occurs as experience strengthens certain connections in cell work groups called:

- a. action potentials.
- b. neural networks.
- c. endocrine systems.
- d. dendrites.

*Structures*

- 1. hypothalamus
- 2. lesion
- 3. EEG
- 4. fMRI
- 5. reticular formation
- 6. MRI
- 7. thalamus
- 8. corpus callosum
- 9. cerebellum
- 10. amygdala
- 11. medulla

*Functions or Descriptions*

- a. amplified recording of brain waves
- b. technique that uses radio waves and magnetic fields to image brain anatomy
- c. serves as sensory switchboard
- d. contains reward centers
- e. tissue destruction
- f. technique that uses radio waves and magnetic fields to show brain function
- g. helps control arousal
- h. links the cerebral hemispheres
- i. influences rage and fear
- j. regulates breathing and heartbeat
- k. enables coordinated movement

Test yourself

- 1. How do neurons communicate with one another?
- 2. How does information flow through your nervous system as you pick up a fork? Can you summarize this process?
- 3. Why is the pituitary gland called the “master gland”?
- 4. Within what brain region would damage be most likely to disrupt your ability to jump rope?

Your ability to sense tastes or sounds?

In what brain region would damage perhaps leave you in a coma?

What about leaving you without breath and heartbeat?

- 5. As you look straight ahead, how is the visual information sent to your two brain hemispheres?

## Key

- 1) b
- 2) b
- 3) c
- 4) a
- 5) a
- 6) d
- 7) a
- 8) c
- 9) c
- 10) d
- 11) d
- 12) d
- 13) b
- 14) c
- 15) d
- 16) c
- 17) c
- 18) d
- 19) b
- 20) b

## Matching

- 1) d
- 2) e
- 3) a
- 4) f
- 5) g
- 6) b
- 7) c
- 8) h
- 9) k
- 10) i
- 11) j

Test yourself (**I'm putting "best/technical" answer down for these but if you don't have this exactly but have something close, don't sweat it. Use these as tools of info going forward! ☺**)

- 1) You could simply write "chemically." Or the specific answer is: A neuron fires when excitatory inputs exceed inhibitory inputs by a sufficient threshold. When the resulting impulse reaches the axon's end, it triggers the release of chemical neurotransmitters. After crossing a tiny gap (synapse), these molecules activate receptor sites on neighboring neurons.
- 2) Your central nervous systems' hungry brain activates and guides the muscles of your arm and hand via your peripheral nervous system's motor neurons. As you pick up the fork, your brain processes the information from your sensory nervous system, enabling it to continue to guide the fork to your mouth. Summarizing this process, you can say: It starts with sensory input, continues with interneuron processing by the central nervous system, and finishes with motor output.
- 3) The pituitary gland, responding to signals from the hypothalamus, releases hormones that act as triggers. In response, other endocrine glands release their own hormones which in turn influence brain and behavior.

- 4) These regions (lower-level brain areas) are respectively:  
**cerebellum** (Yes it does process sensory input but this is primarily for coordinating movement output and balance)  
**thalamus** (Remember it's the brain's sensory switchboard located on top of brainstem. It directs messages to the sensory receiving areas of the cortex and transmits replies to the cerebellum and medulla.)  
**the reticular formation** (It plays important role in controlling arousal).  
**Medulla** (Base of the brainstem; controls heartbeat and breathing)
- 5) Each of your eyes receives sensory information from your left and right visual fields. Each eye sends information (via your optic nerves) from the left half of your field of vision to the visual area of your right hemisphere. Each eye also sends information from the right half of your field to the visual area of your left hemisphere. Assuming your corpus callosum is intact, each hemisphere quickly transmits the data it receives to the opposite hemisphere: