What is the Nervous System?

Worksheet

The nervous system controls the body using neurons - cells with dendrites, a cell body and an axon - that carry electrical impulses and communicate through chemical synapses.

Questions

1. Which part of a neuron receives incoming signals?

A) Axon
B) Dendrites
C) Myelin sheath
D) Axon terminal

2. What does the myelin sheath do?

A) Produces neurotransmitters
B) Speeds up impulse conduction
C) Stores the nucleus
D) Filters toxins

3. Which division of the nervous system includes the brain and spinal cord?

A) Peripheral nervous system
B) Central nervous system
C) Autonomic nervous system
D) Somatic nervous system

4. Which neuron type carries signals from sense organs to the CNS?

A) Motor neuron
B) Interneuron
C) Sensory neuron
D) Glial cell

5. A myelinated neuron conducts an impulse at about 100 m/s, while an unmyelinated one conducts at about 1 m/s. How many times faster is the myelinated neuron?

6. The human brain has roughly 86 billion neurons, and each neuron can form about 1,000 to 10,000 synaptic connections. Using 7,000 as an average, roughly how many total synapses exist?

7. A sciatic nerve signal travels 1 meter at 100 m/s. How long does it take to reach its destination?

8. Define: What is a neuron?

9. Define: What are the three main parts of a neuron?

10. Define: What does the myelin sheath do?

Answer Key

1. B) Dendrites - Dendrites are branch-like structures specialized to receive signals from other neurons.

2. B) Speeds up impulse conduction - Myelin insulates the axon, allowing impulses to jump between gaps and travel much faster.

3. B) Central nervous system - The central nervous system (CNS) consists of the brain and spinal cord.

4. C) Sensory neuron - Sensory (afferent) neurons carry information from receptors toward the central nervous system.

5. Speed ratio = myelinated speed unmyelinated speed Ratio = 100 / 1 = 100 The myelinated neuron conducts the signal 100 times faster.

6. Total synapses neurons average connections Total 86,000,000,000 7,000 Total 6.02 10 (about 600 trillion synapses)

7. time = distance / speed time = 1 m / 100 m/s = 0.01 s That is 10 milliseconds for the impulse to travel 1 meter.

8. A specialized nerve cell that transmits electrical and chemical signals; the basic functional unit of the nervous system.

9. Dendrites (receive signals), cell body/soma (integrates signals) and axon (sends signals).

10. It insulates the axon and dramatically speeds up the conduction of electrical impulses.