**12. Nervous Tissue homework questions**

Name and date submitted (3 pts):

Instructions: Create space in the document below and respond to all questions. Turn in your completed work by the due date.

(40 questions, 100 points, average 2.5 points per question)

Overview

1. The branch of medical science dealing with the nervous systems is called \_\_\_\_\_\_\_\_\_\_
2. A physician who specializes in the nervous system is called a \_\_\_\_\_\_\_\_\_\_\_\_\_
3. The brain contains about \_\_\_\_\_\_\_\_\_\_\_\_\_\_ neurons
4. Explain how the spinal cord connects to the brain
5. What are ganglia?
6. Three functions of the nervous system. Explain what each is/does
   1. Sensory
   2. Integrative
   3. Motor
7. Name the two subdivisions of the nervous system



Histology of nervous tissue

1. Explain the concept of “electrical excitability”
2. Explain the meaning/function of “action potential”. What is it, what does it do?
3. Explain the structure and function of the “cell body”
4. Explain the structure and function of the “dendrites”
5. Explain the structure and function of the “axon”
6. What do the Neuroglia do? What is their function?
7. What are Schwann Cells, and what is their function?
8. What is meant by “myelination”?
9. Clinical Connection box: What unfortunate disorders can ‘demyelination’ lead to?
10. Explain the physiology behind White Matter and Gray Matter

Organization of the nervous system

1. The central nervous system (CNS) consists of \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. The peripheral nervous system (PNS) consists of \_\_\_\_\_\_\_\_\_\_\_\_
3. The PNS can be subdivided into three systems



1. Explain the functioning of the “sympathetic” and “parasympathetic” divisions of the autonomic nervous system. Contrast them.
2. What does the somatic nervous system do?
3. What does the enteric nervous system do?

Electrical signals in neurons

1. Explain how your nervous system allows you to feel a pen. Summarize.
2. Explain how your nervous system allows you to write a letter with a pen. Summarize.
3. Ion channels
   1. How do leakage channels function?
   2. How do ligand-gated channels function?
   3. How do mechanically gated channels function?
   4. How do voltage-gated channels function?
4. Explain “resting membrane potential” to an intelligent 5th grader
5. How many millivolts (mV) is a typical resting potential?
6. Clinical Connection box: Use proper physiological terms:
   1. How does tetrodotoxin (TTX) function?
   2. How do Novocaine and Lidocaine function?
   3. How does “icing” reduce pain?

Signal transmission at synapses

1. What is the synaptic cleft?
2. How long is the synaptic delay in milliseconds (msec)?

1. Fig. 12.23: Explain how signal transmission occurs at a chemical synapse.
2. Removal of the neurotransmitter: The neurotransmitter (i.e. dopamine, acetylcholine, etc) is removed from the synapse three ways. Explain the basic mechanism of each one…
   1. Diffusion
   2. Enzymatic degradation
   3. Uptake
3. Clinical Connection box: Strychnine is a pesticide. Explain how strychnine poisoning occurs, and what are the results physiologically.

Neurotransmitters

1. Clinical Connection box: Depression can be caused by an imbalance in what three neurotransmitters

1. Clinical Connection box: How do Prozac, Paxil, and Zoloft function? What is the mechanism?
2. Clinical Connection box: How does L-dopa function to help with Parkinson’s disease?
3. Clinical Connection box: How do Amphetamines (used with ADHD) work?
4. Clinical Connection box: How does Botulinum toxin work? (Botox – used for a variety of purposes)
5. Clinical Connection box: How does cocaine function in the synapse? What is the mechanism?