

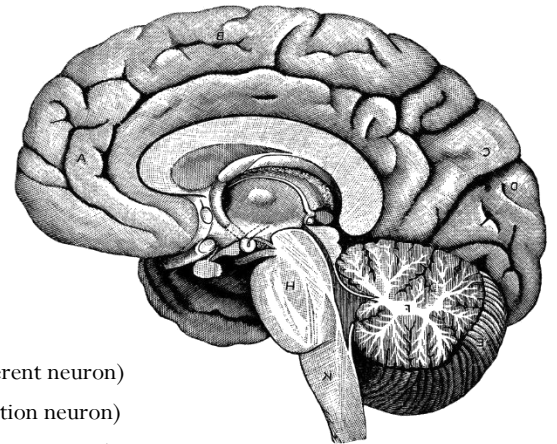
## Study Guide

### Nervous System

#### I.1 Central Nervous System

- neural tube
- stimuli & response
- central nervous system (CNS)
  - spinal cord (vertebrae)
  - brain (cranium, meninges)
  - cranial & spinal nerves
- peripheral nervous system (PNS)
  - somatic nervous system (SNS)
  - autonomic nervous system (ANS)
  - peripheral nerves
- cerebrum
  - central / longitudinal fissure
  - cerebral hemispheres
  - lobes (frontal, temporal, parietal, occipital)
  - cerebral cortex
- corpus callosum
- brain stem
  - medulla oblongata
  - pons
  - mid brain
- cerebellum
- thalamus
- hypothalamus
- neuroendocrine control
- pituitary gland (anterior vs posterior)
- spinal cord regions (cervical, thoracic, lumbar, sacral)
- grey vs white matter
- cerebrospinal fluid
- ventricles
- tracts

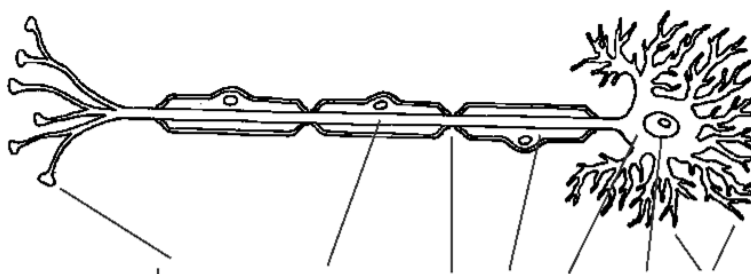
1. Identify the subdivisions of the nervous system and give a basic description of each.
2. Describe the location and function of various regions of the central nervous system.
3. Outline the structure of the spinal cord and how it interacts with other body regions.
4. Identify parts of the brain (diagram, model or on a dissected sample).
5. Name the part of the brain referred to as the “neuroendocrine control center” and briefly describe how it works.



#### I.2 Nerves

- neuron
  - dendrite
  - cell body (soma)
  - axon
  - Schwann cells
  - myelin sheath
  - nodes of Ranvier
- nerve fibre
- mixed nerve
- glial cells
- sensory neuron (afferent neuron)
- interneuron (association neuron)
- motor neuron (efferent neuron)
- ganglion
- reflex arc
  - receptor
  - effector

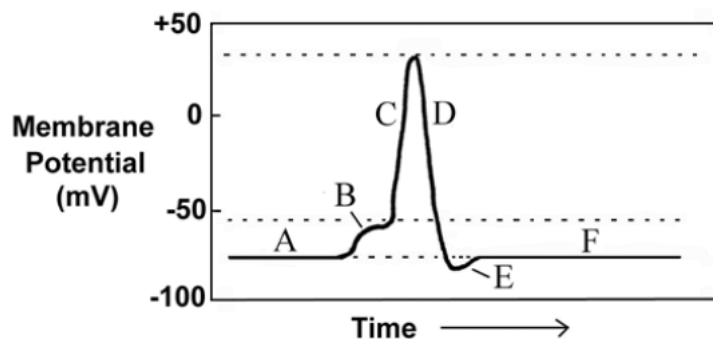
6. Draw a neuron, label (3-6) parts and give the function of those parts.
7. Name and briefly distinguish between the three main types of neurons.
8. Give two differences between a sensory neuron and a motor neuron.
9. Draw a reflex arc and label the receptor, sensory neuron, spinal cord, interneuron, motor neuron, and effector.
10. Explain how a reflex arc works and its evolutionary significance.
11. Describe how the brain is informed that a reflex action has occurred.



### I.3 Impulse Transmission

- saltatory transmission
- axomembrane & axoplasm
- oscilloscope
- sodium-potassium (Na/K) pump
- resting potential
- threshold
- action potential
- depolarization (sodium gates)
- repolarization (potassium gates)
- hyperpolarization
- refractory period
- all-or-none response
- synaptic transmission (synapse)
- axon terminal / terminus
- synaptic gap / synaptic cleft
- presynaptic membrane
- calcium gates
- synaptic vesicles
- neurotransmitters
  - inhibitory
  - excitatory
- contractile proteins
- postsynaptic membrane
- receptors

12. What is the difference in nerve transmission in a myelinated and a nonmyelinated nerve fibre?
13. What causes the transmission of a nerve impulse to begin?
14. Using specific terminology, describe how a nerve impulse is conducted along a neuron beginning with a neuron at rest.
15. Use a diagram to show the polarity and ion distribution on either side of the axonal membrane at rest.
16. Use a diagram to show the polarity and ion distribution on either side of the axonal membrane during depolarization.
17. Use a diagram to show the polarity and ion distribution on either side of the axonal membrane during repolarization.
18. By what process does the sodium potassium pump maintain proper ion distribution during the resting potential?
19. Describe the direction of the transmission of a nerve impulse and explain why transmission is one way only.
20. Diagram and label the oscilloscope pattern that appears during nerve transmission. Use the terms: depolarization, hyperpolarization, repolarization, resting potential, threshold, -65mV, -55mV, 40mV.
21. Using specific terminology, explain synaptic transmission between two neurons.
22. Why do the neurotransmitters that diffuse into the synaptic cleft not stimulate the adjacent neuron over and over?



### I.4 Autonomic Nervous System

- sympathetic division
- parasympathetic division
- noradrenaline / norepinephrine
  - monoamine oxidase
- acetylcholine (Ach)
  - acetylcholinesterase
- fight or flight response
  - adrenaline / epinephrine
  - adrenal gland
  - adrenal medulla

23. Compare function and effectors of the somatic and the autonomic nervous systems. Use a specific examples of body functions to support your response.
24. List the two divisions of the autonomic nervous system.
  - a. Briefly outline the role of each division.
  - b. Describe how the divisions work together.
  - c. Name the neurotransmitter for each division.
25. Where in the body is adrenaline produced? Be specific to the location and the part of the gland.

### I.5 Nervous System Health Topics

26. Name and give a basic description of a disease or disorder associated with the nervous system.