BIOLOGY 217
HUMAN ANATOMY & PHYSIOLOGY I

EXAM 4 REVIEW SHEET

Material Covered on Exam: Chapters 11-12

For this exam, you will be expected to . . .

- List the basic functions of the nervous system.
- Explain the structural and functional divisions of the nervous system.
- List the types of neuroglia and cite of their functions.
- Define neuron, describe its structural components, and relate each to a functional role.
- Differentiate between a nerve and a tract as well as a nucleus and a ganglion.
- Explain the importance of the myelin sheath and describe how it is formed in the central and peripheral nervous systems.
- Classify neurons both structurally and functionally.
- Define resting membrane potential, depolarization, action potential, and repolarization and describe how each is achieved. Describe the mV associated with each phase.
- Differentiate between a graded potential and an action potential.
- Differentiate between saltatory propagation and continuous propagation of an action potential.
- Differentiate between passive channels versus gated channels as well as their location or distribution on the surface of a neuron, and their functions.
- Define synapse and distinguish between an electrical and chemical synapse both structurally and functionally.
- Define neurotransmitters, discuss their role in nerve impulses and name several classes of neurotransmitter discussed in class.
- Describe the anatomical structure of a spinal nerve.
- Relate the distribution pattern and functions of the cervical plexus, brachial plexus, lumbar plexus, and sacral plexus.
- Describe the major functions of the following nerves:
    - Phrenic nerve
    - Radial nerve
    - Ulnar nerve
    - Median nerve
    - Axillary nerve
    - Suprascapular nerve
    - Intercostal nerve
    - Femoral nerve
    - Obturator nerve
    - Saphenous nerve
    - Sciatic nerve
    - Pudendal nerve
    - Tibial nerve
    - Fibular nerve

    - Sural nerve
- Identify the number, function, and classification (sensory, motor, or mixed) of each of the following cranial nerves. Also provide or describe a disorder associated with each.
    - Olfactory nerve
    - Optic nerve
    - Oculomotor nerve
    - Trochlear nerve
    - Trigeminal nerve
    - Abducens
    - Facial nerve
    - Vestibulocochlear nerve
    - Glossopharyngeal nerve
    - Vagus nerve
    - Accessory nerve
    - Hypoglossal nerve
- Describe the sensory organs of smell, trace the olfactory pathways to their destinations in the cerebrum, and explain how olfactory perception occurs.
- Describe the sensory organs of gustation.
- Describe gustatory reception, briefly describe the physiologic processes involved in taste, and trace the gustatory pathway.
- Describe the structures of the external, middle, and inner ear, and explain how they function.
- Describe the structures and functions of the bony labyrinth and membranous labyrinth.
- Describe the functions of hair cells in the semicircular ducts, utricle, and saccule.
- Describe the structure and functions of the organ of Corti.
- Explain the anatomical and physiological basis for pitch and volume sensations for hearing.
- Trace the pathways for the sensations of equilibrium and hearing to their respective destinations in the brain.
- Identify the accessory structures of the eye and explain their functions.
- Describe the layers of the wall of the eye and the anterior and posterior cavities of the eye.
- Explain how light is directed to the fovea of the retina.
- Describe the process by which images are focused on the retina.
- Describe the structure and function of the retina's layers of cells, and the distribution of rods and cones and their relation to visual acuity.
- Explain photoreception; describe the structure of the photoreceptors; explain how visual pigments are activated; and describe how we are able to distinguish colors.
- Explain how the visual pathways distribute information to their destinations in the brain.
- Describe various accommodation problems associated with the cornea, lens, or shape of the eye.

- Describe age-related disorders of olfaction, gustation, vision, equilibrium, and hearing.
- List the divisions of the ANS and the general functions of each.
- Describe the structures and functions of the sympathetic and parasympathetic divisions of the autonomic nervous system.
- Describe the innervation patterns of the sympathetic and parasympathetic divisions of the autonomic nervous system.
- Describe the various types of sympathetic and parasympathetic receptors and their associated neurotransmitters.
- Describe the mechanisms of neurotransmitter release in the ANS and explain the effects of neurotransmitters on target organs and tissues.
- Discuss the relationship between the two divisions of the ANS and the significance of dual innervation.
- Define a visceral reflex and explain the significance of such reflexes.
- Explain the roles of baroreceptors and chemoreceptors in homeostasis.
- Describe the hierarchy of interacting levels of control in the autonomic nervous system beginning with the hypothalamus.

Additionally, you should be reviewing the following items . . .

- Course Textbook; Chapters 11-12
- Course Supplement; Modules 13-14
- A & P Labs 9-10
- Hole's Anatomy & Physiology; Chapters 10-11
- Anatomy & Physiology (McKinley text); Chapters 12-14
- Principles of Anatomy & Physiology (Tortora text); Chapters 12-15
- Seeley's Anatomy & Physiology; Chapters 11-14

Also, be sure to take a look at the links and resources on Canvas and my lecture and laboratory webpage. ***This study guide covers the majority of information on the lecture exam, but possibly not all of it. You are still responsible for any information that was covered but not put on this study guide (intentionally or unintentionally). Good Luck and Study Hard!!!***