

## CSM Biol 260 Physiology

### Review for Exam Two Fall 2009

1. Outline the organization of the nervous system from CNS to PNS, somatic and autonomic divisions, sympathetic and parasympathetic pathways.
2. Describe and or draw glial cells and neurons, discuss functional anatomy, i.e. receiving zone, trigger zone, conduction zone, transmission zone; myelination.
3. Describe the membrane potential characteristics of electrically active cells during resting period
4. Explain and or diagram the events of an action potential including recovery. Define the two refractory periods.
5. Describe and or draw the events of the synapse. Describe characteristics of graded potentials and synaptic integration and summation. Explain how a poison like botulism toxin might interrupt the synapse.
6. Discuss the types of neurotransmitters and their receptors. (Use tables in Marieb for reference). Specifically discuss cholinergic and adrenergic receptor function. Describe selected neurotransmitters and their mechanisms and locations of action. Describe what happens to neurotransmitter molecules after they are done binding to synaptic receptors.
7. Describe the effect of neurotransmitters on the effector organs of the autonomic nervous system using the table provided.
8. Relate neuronal function to tactile reception with respect to density and types of receptors, coding for strength of stimulus, adaptation of receptors, referred pain. Describe the mechanisms for the senses of taste and smell.
9. Relate neuronal function to reflex physiology; compare simple spinal reflex pathways to more complex spinal reflexes (like plantar), and learned reflexes to inherent or unlearned reflexes. Give examples of somatic and autonomic reflexes.
10. Describe the process of vision. From light focusing, direction of looking, color vision, dim light vision and control of brightness, to transduction of the stimulus by the retina, to the neural pathway for processing of the electrical signal. Define myopia, hyperopia, color blindness, blind spot, near point of vision, presbyopia. Diagram the visual pathway. Describe what would happen to vision if various parts of the visual pathway were damaged.
11. Describe the process of hearing. Include description of sound qualities, conduction structures and their function, how sound transduction into a nerve impulse occurs at the Organ of Corti, and the neural processing that occurs. Define conduction deafness and sensorineural deafness.
12. Describe the mechanism of equilibrium sense by describing the structures involved and their functions. Describe the importance of the input of other senses. Define nystagmus.
13. Describe the features of the endocrine system. Describe hormone molecular types and mechanisms of action. Illustrate or describe the hypothalamic/hypophyseal system. Discuss the role of negative feedback in hormonal control, as well as humoral, hormonal, and neural controls.
14. Answer questions about hormone function and source for the following hormones: ADH, oxytocin, thyroid stimulating hormone, adrenocorticotrophic hormone, thyroid hormones, calcitonin, parathyroid hormone, epinephrine, aldosterone, cortisol, insulin, glucagon, hypothalamic releasing and inhibiting factors.
15. Pay special attention to thyroid hormone, insulin and estrogen to answer questions from PhysioEx lab. Understand basis of diabetes mellitus, type I and type II, including the physiological changes

that occur as a result of this disease. Describe the issues present for someone with a hypoactive thyroid, or a hyperactive thyroid.

16. Draw and or describe how a the skeletal muscle cell works. Explain or illustrate sarcomere function in great detail, be sure to include the roles of actin, myosin, troponin and tropomyosin, calcium and ATP.
17. Trace the events of excitation-contraction coupling and relate to fatigue of a muscle.
18. Look at the energy requirements for contraction, describe how energy for contraction is gotten. Describe the factors affecting the force, velocity and duration of contraction. Define series elastic component, isometric contractions, isotonic contractions, motor units, tetanus.
19. Describe the components of the circulatory system. Discuss functions.
20. Describe the characteristics and components of blood. For plasma, list components and describe their functions. List each type of formed element – RBC, WBCs, and platelets and describe their characteristics and functions. What is the structure of hemoglobin? What happens to hemoglobin when RBCs die?
21. Describe the lab tests that might be done on blood and describe the implications of abnormal results. Explain blood types and their significance. Describe the process of hemopoiesis. Define the various common blood pathologies.
22. Illustrate or describe the process of hemostasis, i.e. blood clotting, including the key molecular components of both the extrinsic and intrinsic mechanisms, and the anticoagulant molecules.