Study Guide for Lecture Exam # 3

Chapter 13

1. List and describe the gross anatomical features of the spinal cord. Be sure to include the arrangement of the gray and white matter.

2. Compare and contrast ascending (sensory) and descending (motor) pathways of the spinal cord.

3. Describe the embryonic development of the human brain; begin with the rostral end of the neural tube and follow with the primary and secondary brain vesicles. Show the adult brain structures derived from the vesicles and point out the adult derivatives of the embryonic neural canal (the central cavity of the CNS).

4. Identify the major regions (parts) of the adult brain: cerebral hemispheres, diencephalon, brain stem (midbrain, pons, and medulla), and cerebellum; review the embryonic origins of the adult parts.

5. Name and identify the locations of the ventricles of the brain and review the embryonic origins of these spaces. Trace the pathway of CSF from formation to reabsorption.

6. Name and identify locations of the gross anatomical features of the human brain: (1) lobes (frontal, parietal, temporal, occipital, and the insula); (2) gyri (precentral and postcentral); (3) fissures (transverse and longitudinal); and (4) sulci (lateral, parieto-occipital, and central).

7. List the four motor areas, six sensory areas, and seven association areas of the cerebral cortex; identify specific functions for each.

8. Name and distinguish between the tracts of cerebral white matter: commissural tracts, projection tracts, and association tracts.

9. Identify specific examples and locations of cerebral white matter: corpus callosum and internal capsule.

10. Identify specific examples, functions, and locations of deep gray matter (basal ganglia, forebrain basal nuclei, and claustrum) of the cerebrum.

11. Describe the location of the diencephalon. List the individual parts (the thalamus, the hypothalamus, and the epithalamus), and describe functions, locations, and the structural features of each part.
12. Describe the relationship of the brain stem to the rest of the brain; list the individual components (the midbrain, the pons, and the medulla), and describe the functions, locations, and structural features of each part; review the embryonic origin of the brain stem.

13. List functions of the cerebellum and identify the anatomically gross features: hemispheres, lobes, vermis, folia, and fissures. Distinguish between the gray and white matter of the cerebellum, including the cortex, and the arbor vitae.

14. Compare and contrast the two important functional brain systems—the limbic system and the reticular formation—then describe the locations, functions, and structural features of each system.

15. Explain how the skull, meninges, cerebrospinal fluid, and the blood-brain barrier protect the CNS.

16. Describe the formation of cerebrospinal fluid; trace the pattern of circulation from the ventricular choroid plexuses to the arachnoid villi at the superior sagittal venous sinus.

17. Describe the symptoms and causes of the following examples of brain disorders: traumatic brain injuries, such as concussion and contusion, and degenerative brain diseases, including cerebrovascular accidents (strokes) and Alzheimer’s disease.

18. Explain the symptoms and causes of spinal cord disorders such as paralysis and parathesia.

19. Identify the symptoms and causes of embryonic development and congenital birth defects involving the brain such as anencephaly, spina bifida, and cerebral palsy

Chapter 14

1. Define *peripheral nervous system*. Contrast components of the PNS and CNS; identify the basic divisions and subdivisions.

2. Compare locations of cranial nerves and spinal nerves.

3. Classify sensory receptors three ways: (1) location, (2) stimulus detected, and (3) structure. For each classification, identify specific anatomical class, examples, and associated functions.
4. Name the twelve pairs of cranial nerves and identify their Roman numeral designations. Describe structures innervated by each cranial nerve; indicate if the nerve is sensory, motor, or mixed, and identify the rostral-to-caudal ventral attachments of each. Name the only cranial nerve that attaches from the dorsal midbrain.

5. Identify the type of sensory receptor associated with ten of the twelve pairs of cranial nerves and note the two cranial nerves that lack sensory receptor associations.

6. Identify location of spinal nerves. Differentiate between root and ramus.

7. Define nerve plexus; name four major nerve plexuses; identify the specific ventral rami forming each plexus.

8. Identify body structures served by major nerves from each plexus.

9. Explain how dermatomes are related to the sensory innervation regions of the spinal nerves.

10. Describe the causes and symptoms of shingles, migraine headaches, myasthenia gravis, polio, and postpolio syndrome.

Chapter 15

1. Define autonomic nervous system; identify its effectors, describe its basic functions, and explain the relationship of the ANS to the PNS as a whole.

2. Compare the autonomic and somatic motor systems in terms of types of effectors, number of neurons forming the pathway, speed of conduction along fibers, types of ganglia associated with each system, and neurotransmitters released.

3. Identify the basic divisions of the ANS. Describe the functional differences between the sympathetic and parasympathetic divisions; explain “fight, flight, or fright” and “rest and digest.”

4. Describe the basic anatomical features of the parasympathetic division; explain how the parasympathetic system relates to the brain, cranial nerves, and sacral spinal cord.
5. Describe the basic anatomical features of the sympathetic division; explain how the sympathetic division relates to the spinal cord and spinal nerves.

6. Explain the role of the adrenal medulla as a major organ in the sympathetic division. What is a “surge of adrenaline”?

7. Describe the role and location of visceral sensory neurons relative to autonomic neurons.

8. Distinguish between and define visceral pain and referred pain.

9. Explain how spinal and peripheral reflexes regulate some functions of visceral organs.

10. Identify some disorders of the ANS.

Chapter 16

1. Define taste; describe taste bud histology and explain the gustatory pathway.

2. Identify five basic taste sensations and list the cranial nerves that serve the sense of taste.

3. Define smell; describe olfactory epithelium, explain how smell is relayed to the brain, and identify where smell is analyzed in the brain.

4. Describe the location of the eyeball; describe the anatomy and functions of the accessory structures of the eye: eyebrows, eyelids, conjunctiva, lacrimal apparatus, and extrinsic eye muscles.

5. Identify and describe the anatomical and functional features of the three tunics of the eye, the lens, and the humors of the eye.

6. Explain the structure of the retina and the photoreceptors.

7. Describe the features of the external ear that accommodate the gathering of sound waves and transmission of sound waves to the middle ear.

8. Describe the bony location of the middle ear; explain the function of the associated structures: the pharyngotympanic tube and the ossicles.

9. Identify anatomical structures and their functions of the inner ear.

10. Distinguish between static equilibrium and linear acceleration.
11. Explain how the maculae and otoliths contribute to the sense of static equilibrium.

12. Explain the events occurring in the cochlea that participate in the mechanism of hearing.

13. Identify the causes and symptoms of motion sickness, Ménière’s syndrome, and deafness.