Biology 112
Exam 4 Questions

Chapter 9: Nervous System

1. Identify the location & function of the following parts of a neuron: cell body; axon; dendrite.
2. Identify the major divisions of the nervous system. What structures are included in each division?
3. Identify the 2 major divisions of the peripheral nervous system. What is the function of each?
4. Identify the 3 major functions of the nervous system.
5. Give the function of the following: somatic nervous system; autonomic nervous system. To which division of the nervous system do they belong?
6. Briefly give the function of the following neuroglial cells: Microglial cells; astrocytes; ependymal cells.
7. Briefly give the function of the following neuroglial cells: oligodendrocytes; Schwann cells. Which cell type is in the peripheral nervous system?
8. Define the following with respect to the myelin sheath: neurilemma; node of Ranvier; white matter; gray matter.
9. Which neuroglial cell is most important for nerve cell regeneration in the peripheral nervous system? How does it assist in the process?
10. Describe & give an example of each of the following structural classes of neurons: multipolar neuron; bipolar neuron; unipolar neuron.
11. Give the location & direction of transmission for each of the following functional classes of neurons: sensory neuron; motor neuron; interneuron.
12. Define the following with respect to a neuron: resting potential; action potential; threshold potential.
13. Identify the location of the following ions in a resting neuron (primarily inside vs. outside cell): sodium; chloride; potassium.
14. What specific event produces each of the following in a neuron: depolarization; repolarization; hyperpolarization.
15. What is the function of the myelin sheath in nerve cell impulse conduction?
16. Define: synapse; neurotransmitter. How is the resting voltage in a neuron affected by synaptic transmission in: excitatory synapses; inhibitory synapses.
17. Give 2 examples of the following classes of neurotransmitters: biogenic amines (monoamines); amino acids; peptides.
18. Define: nerve. What are the 3 major types of nerves in the body?
19. Identify the major components of a reflex arc (from stimulus to response).
20. Briefly describe the muscle response and give an example for the following reflexes: stretch reflex; withdrawal reflex.
21. Identify the 3 major layers of the meninges (from outside to inside). Where is the meninges located & what is its function?
22. How many pairs of spinal nerves are there?
23. Define: cervical enlargement; lumbar enlargement; anterior median fissure; posterior median sulcus.

24. Give the location of gray matter & white matter in the spinal cord. What structures make up the spinal cord: gray matter; white matter.
25. Identify the 4 major divisions of the brain & the subdivisions of each.
26. Define with respect to the brain: gyri; sulci; longitudinal fissure; transverse fissure.
27. Identify the location of the 5 cerebral lobes.
28. Identify the major function of the following: cerebral cortex; primary motor cortex; Broca's area.
29. Identify the location & function of the following sensory areas: primary
30. Identify the 3 major brain ventricles & their locations. What fluid is contained within these ventricles?
31. Identify 3 major structures of the diencephalon & the major function of each.
32. Identify the major function of the following brain regions: limbic system; cerebellum.
33. Identify 3 major structures of the brainstem & the major function of each.
34. What are the 2 major classes of nerves in the peripheral nervous system? What types of activities does each control?
35. Give the major function of the following divisions of the nervous system: somatic nervous system; autonomic nervous system; sympathetic division of the ANS; parasympathetic division of the ANS.

Chapter 10: Somatic & Special Senses

36. Identify 5 major classes of sensory receptors by stimulus type.
37. Identify the 3 major classes of touch & pressure receptors & the location of each.
38. Define: visceral pain; referred pain; sensory adaptation. What type of receptors are least likely to adapt?
39. Identify 3 major neurotransmitters that inhibit pain reception and where in the brain they are released.
40. What type of cells are the receptors for smell & where are they located?
41. Detail the pathway to the brain for sensation of smell (nerve & cortical region).
42. What type of cells are the receptors for smell & where are they located?
43. What are the 4 types of tastes sensed by taste buds & where is each roughly sensed on the tongue?
44. Detail the pathway to the brain for sensation of taste (nerves & cortical region).
45. What type of cells are the receptors for hearing & equilibrium and where are they located?
46. Identify the major components of the: external ear; middle ear; inner ear.
47. Identify the 3 auditory ossicles. What is their function in hearing?
48. Give the function of the following ear structures: eardrum (tympanic membrane); oval window; auditory tube.
49. Detail the pathway to the brain for sensation of hearing (nerve & cortical region).
50. Give the sensory function (hearing, static equilibrium, dynamic equilibrium) & receptor name for the following inner ear structures: vestibule; cochlea; semicircular canals.
51. What type of cells are the receptors for vision & where are they located?
52. Identify the muscles that open & close the eyelids. Identify the muscle types that move the eyeball & the 3 cranial nerves that control them.
53. Give the function of the following: conjunctiva; lacrimal gland; extrinsic eye muscles.

54. Identify the major components of the following eyeball layers: outer layer; middle layer; inner layer.
55. Give the function of the following eye structures: cornea; lens; iris; ciliary body; pupil.
56. Identify the 2 major types of photoreceptors & the type of light each senses.
57. Define: optic disc; fovea centralis; vitreous humor.
58. Define the following components of the photoreceptors: retinal; rhodopsin; opsin. What are the 3 colors of opsin proteins in cones?
59. Detail the pathway of light through the eyeball to the photoreceptors.
60. Detail the pathway to the brain for sensation of vision (nerve & cortical region).

Chapter 11: Endocrine System

61. Identify the major endocrine glands & general location of each.
62. What molecule is used as the primary building block for steroid hormones?
63. Identify the major glands that secrete steroid hormones.
64. How do steroid hormones enter cells & exert their effect on cells?
65. How do nonsteroid (amino acid) hormones enter cells & exert their effect on cells?
66. What are the 2 master control centers for hormone secretion (control secretions from other endocrine glands)?
67. Identify 6 hormones produced by the anterior pituitary and the general function of each.
68. Identify 2 hormones secreted by the posterior pituitary and the general function of each. Where are these hormones produced?
69. Identify 3 hormones produced by the thyroid gland and the general function of each.
70. Identify the hormone produced by the parathyroid gland and its general function.
71. Identify 2 hormones produced by the adrenal medulla and the general function of each.
72. Identify 3 hormones produced by the adrenal cortex and the general function of each.
73. Identify 2 hormones produced by the pancreas and the general function of each. Where are these hormones produced in the pancreas?
74. Identify 1 hormone produced by each of the following & its general function: pineal gland; thymus; ovaries; testes.

Chapter 12: Blood

75. Identify the major components of blood (fluid & formed elements).
76. What is the function of red blood cells? How do they differ from typical cells?
77. Identify the components of a hemoglobin molecule. What part of hemoglobin binds to oxygen?
78. What are typical red blood cell counts for men & women? What are typical total blood volumes for men & women?
79. Where are red blood cells broken down in the body? What happens to the various components of hemoglobin?
80. Where are red blood cells produced in the body? Identify a hormone, a vitamin & a mineral that stimulates their production.
81. Identify the cause of: anemia; polycythemia; leukemia; leukocytosis; leukopenia.
82. Identify the 3 granulocyte white blood cells and the major function of each.

83. Identify the 2 agranulocyte white blood cells and the major function of each.
84. What are platelets & what cell type are they made from? What is another name for platelets?
85. Identify 3 major plasma proteins & the function of each.
86. Give the function of the following plasma components: lipoproteins; electrolytes.
87. Define: hemostasis; coagulation. Identify the function of the following proteins in coagulation: prothrombin; thrombin; fibrin; plasmin.
88. Define: thrombus; embolus; anticoagulant (give examples).
89. For each of the following ABO blood groups, identify the antigens present on red blood cells, the antibodies made & possible blood types for transfusion: A; B; AB; O.
90. What is Rh antigen & where is it found? What blood type is the: universal donor; universal recipient?