### Biology 358 — Neuroanatomy Second Exam

Please **print your name clearly** on the back of the last page of this exam. Please read the instructions preceding each section carefully.

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You must answer *all* questions on this exam. Because statistics demonstrate that, on average, between 2-5 questions on every exam are ambiguous enough to come out "aberrant" on an item analysis the total number of points possible on this exam is 106. However, grades will be calculated out of a possible 100 points, assuming that 2-3 questions on this exam are aberrant.

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## Section 1: Picture labeling. Lower- to moderate-level thinking skills according to Bloom.

The following pages are unlabeled diagrams of either spinal cord or some portion of the brain. Utilizing the blue marker supplied to you, label the following structures on the diagram. **Outline the area in the diagram where the structure would be found, and then extend a line from the diagram out to the white margin. (You need to do this on one side only)**. In the white margin label the outlined segment with the number found to the left of the structures listed below. **However, if the structure is not found on the segment** put the number in the margin of the segment and mark the structure **NFOS** (not found on segment). (2 points each)

#### HBS-19: Oblique section through the diencephalon at an intermediate level.

- 1. Structure where the synapse between SON and TOD occurs for the dorsal columns and the spinothalamic tracts
- 2. Caudate
- 3. Structure within this section of the thalamus that is, according to the varying forms of terminology dealing with the Basal Ganglia, is considered to be part of the striatum *and part of* the lenticular nucleus.
- 4. VPM
- 5. SON of the spinothalamic system.

#### HSB-16: Transverse section of the upper midbrain

- 6. UMN of the pyramidal system
- 7. This structure is part of the basal ganglia. *Part of the structure to be circled* sends excitatory stimuli to the striatum in the direct loop. Because you cannot differentiate between the two subdivisions of this structure circle the entire structure in question. **SN**
- 8. Relay center that is integrally involved in visual reflexes.
- 9. Reticular formation
- 10. SON of the dorsal columns
- 11. Red nucleus
- 12. Medial geniculate body
- 13. SON of the spinothalamic system
- 14. Relax collect two free points by signing your name somewhere on this page.

#### HBS-20: Transverse section through the basal ganglia and rostral portion of the thalamus.

- 15. Major output structure of the basal ganglia
- 16. Structure within this section of the thalamus that is involved with emotional drives
- 17. Structure within this section of the thalamus that is involved with motor activity and feedback control.
- 18. Structure within this section of the thalamus that is, according to the varying forms of terminology dealing with the Basal Ganglia, is considered to be part of the striatum *and part of* the lenticular nucleus.
- 19. Corpus callosum

# HBS-14: Transverse section through the inferior colliculus and the rostral portion of the pons.

- 20. Lateral lemniscus
- 21. SON of the dorsal columns
- 22. Location of the decussation of the superior cerebellar peduncle
- 23. Location of the decussation of the inferior cerebellar peduncle
- 24. Reticular formation
- 25. Inferior colliculus

#### HBS-18: Oblique section through the diencephalon at the posterior level

- 26. Structure where the synapse between SON and TOD occurs for the dorsal columns and the spinothalamic tracts
- 27. Pulvinar
- 28. Junction between the third ventricle and the aqueduct of the mesencephalon.
- 29. Third ventricle
- 30. SON of the spinothalamic system

#### Section 2: Essay questions; higher-level thinking skills according to Bloom.

Answer the questions (one per page) on the accompanying blank pages of this exam. Each question is worth the number of points indicated.

Please write clearly and in the size that an old man like myself can easily read!

- 31. List the functions of the thalamus *and tell how the thalamus accomplishes these functions*. (10 points)
- 32. Answer each part of this question. *Please limit yourself to no more than one side of one page of paper for your <u>complete answer to #32</u>. (15 points)* 
  - a. The basal ganglia help regulate skeletal muscle activity by two loops: the direct and indirect loops. Draw and label both of these loops.
  - b. Compare and contrast the actions and functions of these two loops
- 33. As you are walking out the classroom at the conclusion of this test you drop your pencil. You bend over to pick the pencil up — a rather simple musculoskeletal action. Tell how each subdivision of the cerebellum allows you to accomplish this task.