Anatomy and Physiology
Sheep Brain Dissection

TOTAL
_____ /104 pts

Name _____
Period _____

Objectives:
1. Identify, list and describe the principle structures and functions of the sheep brain.
2. Compare and contrast the sheep and human brain.

Materials:
Dissection tools, tray, goggles, apron, preserved specimen, diagrams from the textbook

Procedure:

External Sheep Brain

1. Place brain on the tray dorsal side up.
2. Observe the outer membrane (dura mater). (2 inner meninges are the pia mater, and the arachnoid mater).
3. Cut off the dura mater and expose the cerebrum. Observe the gyri (ridges) and the sulci (grooves).
4. Identify the longitudinal fissure, which separates the right and left hemispheres of the brain.
5. Locate the frontal, parietal, temporal, and the occipital lobes of the brain.
6. Observe the ventral surface of the brain.
7. Locate the optic chiasm, pons, cerebellum, medulla oblongata, olfactory bulbs, and the optic nerves.

1. **DRAW** a sketch of the **LATERAL VIEW** of the sheep brain in the space below.

___ / 12 pts

   a. LABEL the following directions: *Rostral, Caudal, Dorsal, and Ventral*

   b. LABEL the following structures: *Cerebrum, Cerebellum, Spinal Cord, Medulla Oblongata, Frontal Lobe, Temporal Lobe, Occipital Lobe, Parietal Lobe*

2. **<u>DRAW</u>** a sketch of the **DORSAL VIEW** of the sheep brain in the space below.

___ /10 pts

a. <u>LABEL</u> the following directions on your sketch: *Rostral and Caudal*

b. <u>LABEL</u> the following structures on your sketch: *Right Cerebral Hemisphere, Left Cerebral Hemisphere, Cerebellum, Spinal Cord, Longitudinal Fissure, Transverse Fissure, Sulci, Gyri*

3. Sketch a **<u>VENTRAL VIEW</u>** of the sheep brain in the space below.

___ /6 pts

a. <u>LABEL</u> the following directions on your sketch: *Rostral and Caudal*

b. <u>LABEL</u> the following structures on your sketch: *Pituitary Gland, Olfactory bulbs, Optic Chiasma, Oculomotor Nerve*

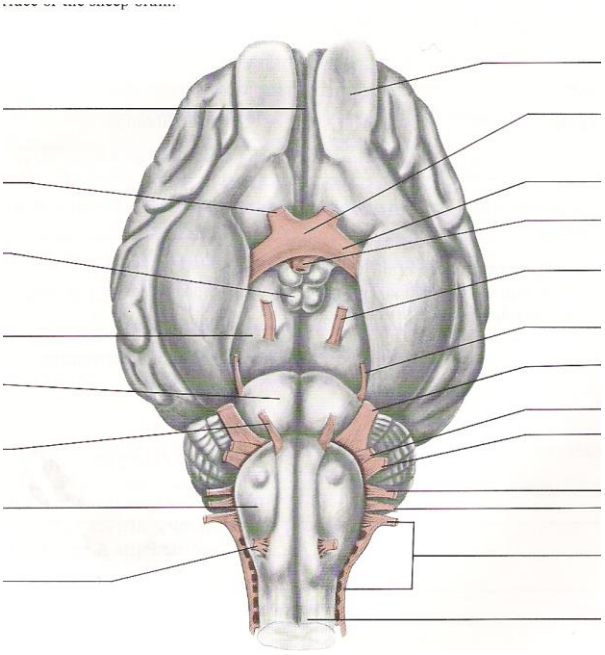
4. **Cranial Nerves**: Complete the chart below by naming the matching nerve and number I-XII.

____ /12 pts
(1 point each)

Number	Nerve	Activity	Function
		Motor	Sensation of taste/ Movement of face and neck muscles
		Sensory	Hearing/ Balance
		Sensory/ Motor	Sensation of taste from tongue, movement for swallowing, and saliva production
		Sensory/ Motor	Sensation of thorax & abdomen/ Movement of thorax & abdomen
		Motor	Movement of neck muscles
		Motor	Movement of tongue & throat muscles
		Motor	Movement of eye muscles
		Sensory/ Motor	Sensations from head, teeth, and tongue/ Movement of jaw muscles
		Motor	Movement of external eye muscles
		Motor	Movement of pupillary muscles and external eye muscles
		Sensory	Sight
		Sensory	Smell (olfaction)

5. Label and study the **ventral view of the sheep brain** below.

____ /19 pts
(1 point each)



Word bank: Optic nerve, Oculomotor nerve, Midbrain, Longitudinal fissure, Abducens nerve, Olfactory bulb, Pons, Optic tract, Trochlear nerve, Medulla, Hypoglossal nerve, Optic chiasma, Facial nerve, Glossopharyngeal nerve, Trigeminal nerve, Vestibulocochlear nerve, Vagus nerve, Spinal cord, Accessory nerve

Note: Only label the indicated structures from the word bank above in the diagram.

Internal Sheep Brain

1. Use the scalpel to cut the specimen along the midsagittal plane. Use the longitudinal fissure as a guide for the incision.
2. The **corpus callosum** had been connecting the two cerebral hemispheres and can now be clearly viewed. You may be able to see a hollow cavity just ventral to the corpus callosum in each brain half. These cavities are the lateral ventricles that contain cerebrospinal fluid.
3. Return your attention to the midsagittal section. Identify the white matter pattern, or **arbor vitae**, of the **cerebellum**.
4. Locate the **pineal body** and **optic chiasma**. In this section, only the intermediate mass of the thalamus is visible. It appears as a circle of gray matter surrounded by the shallow section of the third ventricle.
5. Identify the pons and medulla in the midsagittal section.

___ /10 pts

6. Sketch a **MEDIAL VIEW** of the sheep brain in the space below

a. LABEL the following structures on your sketch: Cerebral Cortex, Corpus Callosum, Lateral Ventricle, Diencephalon, Cerebellum, Arbor Vitae, Medulla Oblongata, Pons, Spinal Cord, Pituitary Gland

Sheep Brain Dissection Terminology

____ /13 pts
(1 point each)

7. **Provide a detailed FUNCTION of the following brain parts. USE YOUR BOOK!**

STRUCTURE - **FUNCTION**
Frontal Lobe -
Temporal Lobe –
Occipital Lobe –
Parietal Lobe -
Cerebellum –
Medulla Oblongata –
Corpus Callosum -
Thalamus –
Hypothalamus –
Pons –
Pituitary Gland –
Ventricles –
Arbor Vitae –

Post-Lab Questions: Please use your lab, notes, and textbook to answer the following questions.

Comparative Anatomy Questions:

____ /22 pts
(1 point each)

1. Compare the relative size of the sheep and human cerebral hemispheres.

2. Compare the gyri and sulci in a sheep and human brain. How does the number differ?

3. What does this say about the brain capacity and capabilities differences between sheep and human?

4. Other than size differences, what structural differences are there between the sheep and human cerebellum?

5. How does the size of the sheep olfactory bulbs compare to those of the human?

6. Based on their relative sizes, which of the cranial nerves seem to be the most developed in the sheep brain?

7. What is the significance in the size differences in the above cranial nerves from questions 5 and 6? (What advantage will this give the sheep)

Functional Neuroanatomy Questions

8. What is a gyrus? What is a sulcus?

9. What are the functions of the pre-central gyrus? What are the functions of the post-central gyrus?

10. What is a neuron?

11. Name and describe the three parts of a neuron.

12. What is a synapse?

13. What are the different parts of the brain stem?

14. Describe the function of each part of the brain stem.

15. Name and describe the three meninges.

16. What is the function of cerebrospinal fluid?

17. What are the symptoms, cause, and treatment for hydrocephalus? If left untreated, what is the likely result?

18. Why are Broca's and Wernicke's areas important?

19. A man can talk, but not understand what is said to him. What area of his temporal lobe may be injured?

20. After a stroke, a woman can understand words, but seems unable to talk. What area of her temporal lobe may be injured?

21. After surviving a stroke, a person is unable to move one of her limbs. What general area of the brain may have been injured?

22. You meet a blind person who has nothing structurally wrong with his eyes or optic nerve. What general area of the brain may have been injured?