



HENDRIX

COLLEGE

Behavioral Neuroscience Notes

PSYC 360

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Exam 1b

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1.1

Directions: For short answer questions, write your response in the space provided. Most of the short answer questions should be only a sentence or two long. For multiple choice questions, circle the letter of the correct response. For fill-in-the-blank questions, write your response in the space provided. For matching questions, write the letter of the correct response in the space to the right. For true or false questions, write “True” if the statement is true, and if the statement is false, *explain why* the statement is false. Lastly, the sections (1.1, 1.2, etc.) are provided to break the exam into smaller parts. Good luck!

Q1.1.1 Short Answer: Define neuroscience.

Answer:

Q1.1.2 True or False: Behavioral neuroscience involves understanding the nervous system’s underlying behavior.

Answer:

Q1.1.3 Fill in the Blank: The Central Nervous System (CNS) is composed of the _____ and the _____.

Q1.1.4 Matching: Match the following systems with their primary functions.

Choices

- (i) Voluntary motor control and sensory input.
- (ii) Involuntary control of the gastrointestinal system.
- (iii) Involuntary control of smooth muscle and glands.

(a) Somatic Nervous System _____

(b) Autonomic Nervous System _____

(c) Enteric Nervous System _____

Q1.1.5 Fill in the Blank The autonomic nervous system regulates the body’s _____ AND _____ response.



Q1.1.6 Short Answer: How does the flight-or-flight response affect your body?

Answer:

Q1.1.7 Fill in the Blank: In the fecal microbiota transplant study, researchers found that the microbiota change the _____ of the mice.

Q1.1.8 Fill in the Blank: In the elevated plus maze study, researchers found that the anxious mice were more willing to _____ after the fecal microbiota transplant.



1.2

Q1.2.1 Short Answer: What is the primary function of the meninges?

Answer:

Q1.2.2 Multiple Choice: Which of the following is the middle meningeal layer?

- | | |
|------------------------|------------------------|
| (A) Arachnoid Membrane | (B) Dura Mater |
| (C) Pia Mater | (D) Subarachnoid Space |

Q1.2.3 Short Answer: Why did early anatomists call the outermost meningeal layer “pachymeninges”?

Answer:

Q1.2.4 Fill in the Blank The Peripheral Nervous System uses _____ layer(s) of the meninges.

Q1.2.5 Fill in the Blank: Arachnoid _____ are web-like structures that connect the Arachnoid Membrane to the *pia mater*

Q1.2.6 Multiple Choice: Which combination of symptoms is LEAST consistent with a diagnosis of acute bacterial meningitis?

- (A) Fever, headache, and nuchal rigidity. (B) Photophobia, vomiting, and altered mental status.
- (C) None of the above.

Q1.2.7 Fill in the Blank: The subarachnoid space is filled with _____.



Q1.2.8 Short Answer: What is meningitis?

Answer:

~~~~~

## 1.3

**Q1.3.1 Short Answer:** List two functions of CSF.

*Answer:*

**Q1.3.2 True or False:** CSF is similar in composition to blood plasma.

*Answer:*

**Q1.3.3 Fill in the Blank:** CSF is produced by the \_\_\_\_\_ cells lining the lateral ventricles.

**Q1.3.4 Fill in the Blank:** A contra-coup injury is an injury that occurs on the \_\_\_\_\_ side of the brain from the impact site.

~~~~~

1.4

Q1.4.1 Matching: Match the location with its description.

Choices

- (i) Connected to the pituitary gland via the infundibulum.
- (ii) Production of CSF and connection to the third ventricle via the interventricular foramen.
- (iii) Connects the third and fourth ventricles.

(a) Lateral Ventricles _____

(b) Third Ventricle _____

(c) Cerebral Aqueduct _____

Q1.4.2 True or False: The central canal connects the fourth ventricle to the spinal cord.

Answer:

~~~~~



## 1.5

**Q1.5.1 Short Answer:** Where is CSF absorbed into the bloodstream?

*Answer:*

**Q1.5.2 Fill in the Blank:** \_\_\_\_\_ is caused by swelling of the brain due to a blockage in the CSF flow.

**Q1.5.3 True or False:** The *Interventricular Foramen* connects the lateral ventricles to the third ventricle.

*Answer:*

~~~~~

1.6

Q1.6.1 Fill in the Blank: The term “*epi*” means _____ and the term “*tap*” means _____.

Q1.6.2 Multiple Choice: A lumbar puncture is sometimes called a:

(A) Brain Tap

(B) Spinal Tap

(C) CSF Drain

(D) Ventricular Tap

Q1.6.3 Fill in the Blank: The needle for a lumbar puncture is typically inserted into the _____ sac in the lumbar region.

~~~~~

## 1.7

**Q1.7.1 True or False:** Cranial nerve IV controls pupil constriction and eye movement.

*Answer:*

**Q1.7.2 Short Answer:** What is the function of cranial nerve X?

*Answer:*

**Q1.7.3 Fill in the Blank:** There are \_\_\_\_\_ cranial nerve(s) that modulate eye movements, and \_\_\_\_\_ cranial nerve(s) that control the sense of vision.



**Q1.7.4 Matching:** Match the cranial nerve number with its function.

**Choices**

- (i) Facial sensation or motor control of the mandible
- (ii) Vision
- (iii) Smell

- (a) I ..... \_\_\_\_\_
- (b) II ..... \_\_\_\_\_
- (c) V ..... \_\_\_\_\_

**Q1.7.5 True or False:** The term “*glossal*” means “taste”.

*Answer:*

**Q1.7.6 Fill in the Blank:** For the following table, fill in the blanks with the correct name.

| Cranial Nerve | Name  | Cranial Nerve | Name  |
|---------------|-------|---------------|-------|
| I             | _____ | VII           | _____ |
| II            | _____ | VIII          | _____ |
| III           | _____ | IX            | _____ |
| IV            | _____ | X             | _____ |
| V             | _____ | XI            | _____ |
| VI            | _____ | XII           | _____ |

## 1.8

**Q1.8.1 Short Answer:** What does the term *Soma* refer to?

*Answer:*

**Q1.8.2 True or False:** The term “*nucleus*” refers to a collection of cell bodies in the PNS.

*Answer:*



**Q1.8.3 Fill in the Blank:** Fill in the following table for the terms that match its definition.

| Term  | Definition                                    |
|-------|-----------------------------------------------|
| Tract |                                               |
| _____ | The ends of the neuron that send information. |
| _____ | Extends surface area of the neuron.           |
| _____ | A collection of axons in the PNS.             |

**Q1.8.4 True or False:** *Ganglion* are collections of axons.

*Answer:*

**Q1.8.5 Short Answer:** What is the function of the myelin sheath?

*Answer:*



## 1.9

**Q1.9.1 Short Answer:** Name two principal structures of the hindbrain.

*Answer:*

**Q1.9.2 Short Answer:** What vital functions are regulated by the Reticular Formation in the Medulla Oblongata?

*Answer:*

**Q1.9.3 Short Answer:** Describe the role of the Pons in the brainstem.

*Answer:*

**Q1.9.4 Fill in the Blank:** Pons directly translates to \_\_\_\_\_ in Latin.

**Q1.9.5 Fill in the Blank:** The \_\_\_\_\_ (specific) is a structure in the pons that produces norepinephrine.

**Q1.9.6 True or False:** The norepinephrine produced by the Locus Coeruleus is sent primarily to the hind brain.

*Answer:*

**Q1.9.7 Short Answer:** What is the primary function of the cerebellum?

*Answer:*





**Q1.9.8 Bonus Short Answer:** Can you name every function of the cerebellum? (There's 8!)

*Answer:*

**Q1.9.9 Fill in the Blank:** The rare malformation wherein the cerebellum is not developed is called \_\_\_\_\_.

**Q1.9.10 Multiple Choice:** Which of the following midbrain structures is primarily responsible for visual reflexes?

(A) Olives (B) Pyramids (C) Superior Colliculus (D) Substantia Nigra

**Q1.9.11 Fill in the Blank:** The \_\_\_\_\_ in the midbrain is critical for motor coordination.

**Q1.9.12 Short Answer:** What does the *periaqueductal gray area* produce?

*Answer:*

**Q1.9.13 True or False:** The medulla oblongata contains the reticular formation which regulates vital functions like heart rate and respiration.

*Answer:*

**Q1.9.14 Fill in the Blank:** The midbrain's \_\_\_\_\_ Colliculus is important for visual reflexes, while the \_\_\_\_\_ Colliculus is involved in auditory reflexes.

**Q1.9.15 Multiple Choice:** The *substantia nigra* is known for its role in:

- (A) Serotonin production
- (B) Dopamine production
- (C) GABA production
- (D) Acetylcholine production



## 1.10

**Q1.10.1 Short Answer:** What is the role of the thalamus in the brain?

*Answer:*

**Q1.10.2 Short Answer:** What does it mean to be a non-specific relay nuclei?

*Answer:*



**Q1.10.3 Multiple Choice:** The thalamic nucleus responsible for pain routing sends those signals to the:

- (A) Prefrontal Cortex (B) Primary Somatosensory Cortex  
(C) Primary Motor Cortex (D) Amygdala

**Q1.10.4 Fill in the Blank:** Fill in the following table with the correct terms.

| Thalamic Relay Nuclei | Role                 |
|-----------------------|----------------------|
| _____                 | Vision               |
| _____                 | Pain                 |
| _____                 | Promotes wakefulness |

**Q1.10.5 Fill in the Blank:** The *Massa Intermedia* connects the left \_\_\_\_\_ half with the right half.

**Q1.10.6 Multiple Choice:** Which of the following is NOT a function of the hypothalamus?

- (A) Survival of the individual  
(B) Survival of the species  
(C) Regulation of endocrine system  
(D) Integration of information

**Q1.10.7 True or False:** The hypothalamus is involved in both individual survival functions (like eating and drinking) and species survival functions (such as reproduction).

*Answer:*

**Q1.10.8 True or False:** The *Suprachiasmatic Nucleus* is responsible for circadian rhythms.

*Answer:*

**Q1.10.9 Fill in the Blank:** The *Corpus Callosum's* neurons go from \_\_\_\_\_ to \_\_\_\_\_ and not from \_\_\_\_\_ to \_\_\_\_\_. (Your answers should directions.)

**Q1.10.10 Multiple Choice:** Which of the following is NOT a symptom of Callosal Agenesis?

- (A) Impaired motor coordination (B) Impaired language comprehension  
(C) Impaired spatial awareness (D) Impaired executive functions

**Q1.10.11 Fill in the Blank:** The \_\_\_\_\_ is involved in the regulation of voluntary motor control.



**Q1.10.12 Fill in the Blank:** The *Striatum* consists of the \_\_\_\_\_, \_\_\_\_\_, and the \_\_\_\_\_. (Note: The *Globus Pallidus* is not a viable answer here.)

**Q1.10.13 True or False:** When people mention the Nucleus Accumbens and the Globus Pallidus, they call it the lentiform nucleus.

Answer:

**Q1.10.14 Matching:** Match the following telencephalic structures with their functions.

**Choices**

- (i) Sensory integration and spatial awareness.
- (ii) Executive functions, motor control, language production.
- (iii) Memory, hearing, language comprehension.
- (iv) Vision

(a) Frontal Lobe ..... \_\_\_\_\_

(b) Temporal Lobe ..... \_\_\_\_\_

(c) Parietal Lobe ..... \_\_\_\_\_

(d) Occipital Lobe ..... \_\_\_\_\_

**Q1.10.15 Fill in the Blank:** Participants in Rees et al.'s (2011) study showed extreme conservatives had a larger \_\_\_\_\_

**Q1.10.16 Short Answer:** How does the hippocampus have an impact upon memory?

Answer:

**Q1.10.17 Short Answer:** What is the left hemisphere of the brain responsible for? And the right hemisphere? (2 each.)

Answer:

**Q1.10.18 Multiple Choice:** In a study by Eisenberger (1990) called the Cyberball study, participants who were excluded from the game showed increased activity in the:

- |                               |                    |
|-------------------------------|--------------------|
| (A) Amygdala                  | (B) Hippocampus    |
| (C) Anterior Cingulate Cortex | (D) Septal Nucleus |



**Q1.10.19 Matching:** Arrange the following structures in the brain in the right order.

**Choices**

- (i) Tectum
- (ii) Medulla Oblongata
- (iii) Limbic System
- (iv) Hypothalamus

- (a) Myelencephalon ..... \_\_\_\_\_
- (b) Diencephalon ..... \_\_\_\_\_
- (c) Telencephalon ..... \_\_\_\_\_
- (d) Mesencephalon ..... \_\_\_\_\_

**Q1.10.20 Short Answer:** What is *Kluver-Bucy Syndrome*?

*Answer:*

**Q1.10.21 Fill in the Blank:** The \_\_\_\_\_ is involved in the regulation of emotions, memory, and motivation.

**Q1.10.22 Fill in the Blank:** Selective attention, love, and pain are all functions of the \_\_\_\_\_.

**Q1.10.23 Short Answer:** What lobes make up the *Cerebral Cortex*?

*Answer:*

**Q1.10.24 Short Answer:** We learned that the *Temporal Lobe* is responsible for language comprehension. Who was the scientist that discovered this? Similarly, we learned that the *Frontal Lobe* is responsible for language production. Who was the scientist that discovered this?

*Answer:*



**Q1.10.25 Fill in the Blank:** Fill out the following table with the correct terms.

| Major Divisions | Ventricle | Subdivision | Principal Structures |
|-----------------|-----------|-------------|----------------------|
| Forebrain       |           |             | _____                |
|                 |           |             | _____                |
|                 |           |             | _____                |
|                 |           |             | _____                |
| Midbrain        |           |             | _____                |
|                 |           |             | _____                |
|                 |           |             | _____                |
|                 |           |             | _____                |
| Hindbrain       |           |             | _____                |
|                 |           |             | _____                |
|                 |           |             | _____                |
|                 |           |             | _____                |



## 1.11

**Q1.11.1 Multiple Choice:** Which of the following is NOT a typical symptom of Parkinson's Disease?

- (A) Bradykinesia      (B) Rigidity      (C) Tremors      (D) Hyperactivity

**Q1.11.2 Short Answer:** Name one symptom associated with Alzheimer's Disease.

*Answer:*

**Q1.11.3 True or False:** Only retrograde amnesia is observed in Alzheimer's Disease.

*Answer:*