

# Physiological Psychology, Brain Structures, and Neuroimaging Techniques Practice Test (Sample)

## Study Guide



**Everything you need from our exam experts!**

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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

**Remember:** successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

# How to Use This Guide

**This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:**

## **1. Start with a Diagnostic Review**

**Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.**

## **2. Study in Short, Focused Sessions**

**Break your study time into manageable blocks (e.g. 30 - 45 minutes). Review a handful of questions, reflect on the explanations.**

## **3. Learn from the Explanations**

**After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.**

## **4. Track Your Progress**

**Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.**

## **5. Simulate the Real Exam**

**Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.**

## **6. Repeat and Review**

**Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.**

**There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!**

## Questions

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- 1. Which imaging technique provides detailed pictures of brain anatomy and structure?**
  - A. Golgi stain**
  - B. Nissl stain**
  - C. Weigert stain**
  - D. Structural MRI**
  
- 2. Which historical figure correctly identified epilepsy as a brain disorder rather than a supernatural condition?**
  - A. Hippocrates**
  - B. Aristotle**
  - C. Galen**
  - D. Herophilus**
  
- 3. Which two scientists shared the Nobel Prize for their work on neuron structure?**
  - A. Camillo Golgi and Isaac Newton**
  - B. Camillo Golgi and Santiago Ramón y Cajal**
  - C. Santiago Ramón y Cajal and Karl Wernicke**
  - D. Rita Levi-Montalcini and Camillo Golgi**
  
- 4. Key limitation of fMRI?**
  - A. It cannot measure any brain activity.**
  - B. It uses ionizing radiation.**
  - C. It measures neural activity directly.**
  - D. It has a time delay due to the hemodynamic response.**
  
- 5. Which statement describes the neuron doctrine?**
  - A. The brain is a continuous network of fibers.**
  - B. Neuronal signaling occurs only through electrical conduction.**
  - C. The nervous system is composed of individual, discrete cells called neurons.**
  - D. The brain lacks distinct functional units.**

- 6. Which directional term describes toward the tail/back of the body?**
- A. Caudal**
  - B. Dorsal**
  - C. Ventral**
  - D. Medial**
- 7. Which statement about increased intracranial pressure is true?**
- A. It can damage brain tissue**
  - B. It can reduce blood flow**
  - C. It can be life-threatening if untreated**
  - D. All of the above**
- 8. Which area is involved in evaluation and regulation of behavior, including decision-making?**
- A. Frontal Lobe**
  - B. Prefrontal Cortex**
  - C. Temporal Lobe**
  - D. Cerebellum**
- 9. Coordination of movement, balance and posture, and motor learning and timing are core functions of which structure?**
- A. Cerebellum**
  - B. Hippocampus**
  - C. Thalamus**
  - D. Hypothalamus**
- 10. What is the fatty insulating layer around the axon called?**
- A. Myelin Sheath**
  - B. Node of Ranvier**
  - C. Dendrite**
  - D. Synapse**

## **Answers**

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1. D
2. A
3. B
4. D
5. C
6. A
7. D
8. B
9. A
10. A

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## **Explanations**

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**1. Which imaging technique provides detailed pictures of brain anatomy and structure?**

- A. Golgi stain**
- B. Nissl stain**
- C. Weigert stain**
- D. Structural MRI**

Structural MRI yields noninvasive, high-resolution pictures of brain anatomy and structure. It uses strong magnetic fields and radiofrequency pulses to create detailed cross-sectional images that clearly differentiate gray matter, white matter, and cerebrospinal fluid, making it ideal for mapping brain morphology and spotting structural abnormalities. The other options are histological stains applied to fixed tissue to reveal cellular details or myelin after tissue processing (Golgi for neuron morphology, Nissl for cell bodies, Weigert for myelin). While they provide rich cellular or fiber information, they require tissue preparation and aren't imaging the intact brain in vivo.

**2. Which historical figure correctly identified epilepsy as a brain disorder rather than a supernatural condition?**

- A. Hippocrates**
- B. Aristotle**
- C. Galen**
- D. Herophilus**

Epilepsy as a brain disorder reflects the move from supernatural to natural explanations in medicine. Hippocrates argued that seizures originate in the brain and are a disease of brain structure and function, not a divine punishment or magical influence. This view was a radical departure from the belief that epileptic episodes were caused by supernatural forces and he famously referred to epilepsy as the Sacred Disease, urging that its causes and treatment should be studied like other medical conditions. That explicit brain-based explanation is what makes his stance the correct one, marking an early and important shift toward medical naturalism in understanding brain disorders. The other ancient physicians contributed to early medical knowledge in various ways, but they did not articulate this same clear brain-origin view for epilepsy.

**3. Which two scientists shared the Nobel Prize for their work on neuron structure?**

- A. Camillo Golgi and Isaac Newton
- B. Camillo Golgi and Santiago Ramón y Cajal**
- C. Santiago Ramón y Cajal and Karl Wernicke
- D. Rita Levi-Montalcini and Camillo Golgi

Understanding how neurons are built and how they connect is tested by recalling the scientists who first clarified neuron structure. Camillo Golgi developed a staining method that could color a tiny subset of neurons in full detail, revealing their intricate shapes. Santiago Ramón y Cajal used that approach to argue that neurons are discrete cells, not a continuous network, and that communication occurs at junctions between them. This combination of technical breakthrough and interpretive insight laid the groundwork for the neuron doctrine, a foundational concept in neuroscience. For these contributions, Golgi and Cajal shared the Nobel Prize in Physiology or Medicine in 1906. The other options mix in figures associated with different topics or eras (Newton in physics, Wernicke with language areas, Levi-Montalcini with nerve growth factors) and don't relate to the Nobel-winning work on neuron structure.

**4. Key limitation of fMRI?**

- A. It cannot measure any brain activity.
- B. It uses ionizing radiation.
- C. It measures neural activity directly.
- D. It has a time delay due to the hemodynamic response.**

The main idea is that fMRI signals come from blood flow changes rather than direct neural firing. When neurons become active, the brain's blood vessels respond with increased blood flow, and fMRI detects this hemodynamic change as the BOLD signal. That response isn't immediate—it rises and peaks several seconds after the neural activity and can last for many seconds. This lag gives fMRI excellent spatial resolution but poor temporal resolution, making it hard to pinpoint exactly when events occur or to track rapid sequences of neural activity. That time delay is the fundamental limitation at play here. By contrast, the other statements don't fit: fMRI does measure brain activity indirectly (not measuring neurons directly), it uses non-ionizing magnetic fields (not ionizing radiation), and it does not measure neural activity directly.

5. Which statement describes the neuron doctrine?

- A. The brain is a continuous network of fibers.
- B. Neuronal signaling occurs only through electrical conduction.
- C. The nervous system is composed of individual, discrete cells called neurons.**
- D. The brain lacks distinct functional units.

The neuron doctrine is the idea that the nervous system is built from individual, discrete cells called neurons, and that communication between these cells occurs at specialized gaps called synapses rather than through a continuous web. This means neurons are the basic signaling units that process and transmit information, typically sending signals across synapses to other neurons via chemical neurotransmitters, while electrical signaling occurs along the neuron itself. This view emerged in contrast to the older notion of a uniform, uninterrupted network of fibers. The statement that the nervous system is composed of individual, discrete cells called neurons captures this fundamental idea. The other descriptions—imagining the brain as a continuous network of fibers, claiming signaling happens only through electrical conduction, or asserting there are no distinct functional units—would imply a different organization and mode of communication than what the neuron doctrine describes.

6. Which directional term describes toward the tail/back of the body?

- A. Caudal**
- B. Dorsal
- C. Ventral
- D. Medial

Directional terms explain positions along the body's axis. Caudal means toward the tail end of the body or toward the posterior part along the spinal axis. This is the term used when describing structures toward the coccyx or lower spinal regions. Dorsal, by contrast, refers to the back surface; ventral to the belly surface; and medial to the midline of the body. So when a question asks for toward the tail/back, caudal is the best fit because it specifically designates tailward/posterior direction along the body's axis.

**7. Which statement about increased intracranial pressure is true?**

- A. It can damage brain tissue**
- B. It can reduce blood flow**
- C. It can be life-threatening if untreated**
- D. All of the above**

Rising intracranial pressure is dangerous because the skull encloses a fixed space; as pressure climbs, neural tissue is squeezed, vessels are compressed, and blood flow to the brain drops. It can damage brain tissue through direct compression and secondary ischemia. It also reduces blood flow because cerebral perfusion depends on the gradient between mean arterial pressure and ICP; when ICP increases, cerebral perfusion pressure falls, limiting oxygen delivery to brain tissue. If ICP stays high, the brain can herniate, compressing the brainstem and disrupting essential life-sustaining functions, making the condition life-threatening if not treated promptly. All of these consequences can occur with increased ICP, so that statement is true.

**8. Which area is involved in evaluation and regulation of behavior, including decision-making?**

- A. Frontal Lobe**
- B. Prefrontal Cortex**
- C. Temporal Lobe**
- D. Cerebellum**

Evaluation and regulation of behavior, including decision-making, hinge on the prefrontal cortex. This region sits at the front of the brain and acts as the brain's executive control center. It integrates information from memory, emotion, and sensory inputs to plan actions, monitor ongoing behavior, inhibit impulses, and weigh outcomes before choosing a course of action. It supports working memory, goal maintenance, flexible thinking, and the ability to delay gratification in favor of longer-term objectives. The temporal lobe is more about memory and recognizing objects and sounds, while the cerebellum coordinates movement and balance (and has some higher-level roles, but not central to evaluating choices). The frontal lobe is the broader region that includes the prefrontal cortex, but for the specific functions of evaluating behavior and making decisions, the prefrontal cortex is the key player.

**9. Coordination of movement, balance and posture, and motor learning and timing are core functions of which structure?**

**A. Cerebellum**

**B. Hippocampus**

**C. Thalamus**

**D. Hypothalamus**

The key idea here is the cerebellum's role in coordinating movement, balance and posture, and in motor learning and timing. The cerebellum integrates input from the motor cortex, proprioceptive and vestibular signals, and other brain areas to ensure smooth, precise movements. It helps time muscle contractions correctly, coordinates the sequence of muscle activations, and maintains posture and balance during both steady and changing tasks. For motor learning, it detects discrepancies between intended and actual movement and uses that error signal to fine-tune future commands, refining timing and coordination with practice. Different parts of the cerebellum contribute to different aspects: the vestibulocerebellum supports balance and eye movements, the spinocerebellum coordinates ongoing movements and limb position, and the cerebrellum aids in planning and refining complex movements and their timing. Lesions in this structure produce signs like ataxia, dysmetria, and an abnormal gait, reflecting a breakdown in coordinating movement and maintaining steady posture. Other brain regions listed play different roles. The hippocampus is central to memory formation and spatial navigation, not real-time movement coordination. The thalamus acts mainly as a relay station for motor and sensory signals, not as the primary coordinator of movement. The hypothalamus mainly regulates autonomic and endocrine functions, rather than coordinating motor performance.

**10. What is the fatty insulating layer around the axon called?**

**A. Myelin Sheath**

**B. Node of Ranvier**

**C. Dendrite**

**D. Synapse**

The fatty insulating layer around the axon is the myelin sheath. It wraps around many axons in both the central and peripheral nervous systems, made of lipid-rich material that reduces leakage of electrical current and lowers the membrane's capacitance. This insulation speeds up signal transmission through saltatory conduction, as the action potential effectively hops from one gap in the myelin (the Node of Ranvier) to the next, so the neuron can fire more quickly. Myelin is produced by oligodendrocytes in the brain and spinal cord and by Schwann cells in the peripheral nerves. Dendrites are the neuronal structures that receive signals, and synapses are the junctions between neurons; the Node of Ranvier is a gap in the myelin sheath, not the insulating layer itself.

## Next Steps

**Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.**

**As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.**

**If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at [hello@examzify.com](mailto:hello@examzify.com).**

**Or visit your dedicated course page for more study tools and resources:**

**<https://brainstrucandneuroimaging.examzify.com>**

**We wish you the very best on your exam journey. You've got this!**

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