

ARIZONA STATE UNIVERSITY (ASU) BIO201 HUMAN ANATOMY AND PHYSIOLOGY I EXAM 3 PRACTICE (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE**

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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. How do tendons facilitate the connection between muscle and bone?**
 - A. By providing elasticity
 - B. By forming rigid structures
 - C. By merging with collagen fibers from muscle connective tissues
 - D. By serving as a muscle's primary energy source
- 2. What is the primary product of the glycogen-lactic acid system?**
 - A. Carbon dioxide
 - B. Glucose
 - C. Lactic acid
 - D. ATP
- 3. What is a triad in muscle fibers composed of?**
 - A. Two terminal cisternae and one sarcoplasmic reticulum
 - B. One T tubule and two terminal cisternae
 - C. Three myofibrils
 - D. One sarcolemma and two myofilaments
- 4. Which nerve plexus is located between the vertebrae L1 and L4?**
 - A. Cervical
 - B. Brachial
 - C. Lumbar
 - D. Coccygeal
- 5. What does the term 'decussation' refer to in the context of the nervous system?**
 - A. Nerves branching out
 - B. Fibers crossing sides
 - C. Nerve repair process
 - D. Signal transmission speed

- 6. Which type of neuroglial cell is the most abundant and contributes to the blood-brain barrier?**
- A. Ependymal cells
 - B. Oligodendrocytes
 - C. Astrocytes
 - D. Microglia
- 7. What are myofibrils primarily composed of?**
- A. Proteins and lipids
 - B. Myofilaments
 - C. Nucleus and cytoplasm
 - D. Bone and cartilage
- 8. What is the main role of neuroglia or glial cells?**
- A. Transmit signals quickly
 - B. Support and protect neurons
 - C. Block infections in the CNS
 - D. Conduct impulses
- 9. Which of the following muscles is an example of a large motor unit?**
- A. Eye muscles
 - B. Hand muscles
 - C. Gastrocnemius
 - D. Facial muscles
- 10. The sacral nerve plexus consists of which spinal levels?**
- A. C5-T1
 - B. L1-L4
 - C. L4, L5 and S1-S4
 - D. S4, S5, and C0

Answers

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

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Explanations

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1. How do tendons facilitate the connection between muscle and bone?

- A. By providing elasticity
- B. By forming rigid structures
- C. By merging with collagen fibers from muscle connective tissues**
- D. By serving as a muscle's primary energy source

Tendons play a crucial role in connecting muscles to bones primarily through the merging of their own collagen fibers with those of the connective tissues from the muscles. This integration allows tendons to transmit the force generated by the muscle contraction directly to the bone, enabling movement. The collagen fibers provide strength and stability to the connection, ensuring that the transmission of force is efficient and effective. This mechanism is fundamental in biomechanics, as the organized structure of the tendon-fiber connection allows for the necessary flexibility and durability required for movement while withstanding the various forces applied during muscle contractions. Therefore, the correct understanding of this connection underscores the importance of tendons in the musculoskeletal system, enabling coordinated movement and stability.

2. What is the primary product of the glycogen-lactic acid system?

- A. Carbon dioxide
- B. Glucose
- C. Lactic acid**
- D. ATP

The primary product of the glycogen-lactic acid system is lactic acid. This system is critical during anaerobic respiration, particularly when the body needs energy quickly and oxygen supply is limited, such as during intense exercise. When glycogen is broken down in muscle cells to produce energy without sufficient oxygen, it is converted into glucose and subsequently metabolized through glycolysis. This process generates ATP, which is the immediate energy currency of the cell. However, under anaerobic conditions, after glycolysis occurs, pyruvate is not fully oxidized in the mitochondria to produce carbon dioxide and water. Instead, it gets converted into lactic acid. As lactic acid accumulates, it can be transported back to the liver where it can be converted back into glucose in a process known as gluconeogenesis, but during the initial phase of intense activity, lactic acid is the central product indicating that the anaerobic pathway is dominant. Thus, lactic acid is considered the primary end product of the glycogen-lactic acid system.

3. What is a triad in muscle fibers composed of?

- A. Two terminal cisternae and one sarcoplasmic reticulum
- B. One T tubule and two terminal cisternae**
- C. Three myofibrils
- D. One sarcolemma and two myofilaments

A triad in muscle fibers is specifically composed of one T tubule and two terminal cisternae of the sarcoplasmic reticulum. The T tubules are invaginations of the sarcolemma that help transmit the action potential deep into the muscle fiber, while the terminal cisternae are enlarged areas of the sarcoplasmic reticulum that store calcium ions, which are crucial for muscle contraction. This configuration is essential for the process of excitation-contraction coupling. When an action potential travels along the T tubule, it triggers the release of calcium from the terminal cisternae into the cytosol of the muscle cell, ultimately leading to muscle contraction. The arrangement of these components in a triad allows for efficient communication and rapid response in muscle contraction.

4. Which nerve plexus is located between the vertebrae L1 and L4?

- A. Cervical
- B. Brachial
- C. Lumbar**
- D. Coccygeal

The lumbar plexus is situated in the region between the first lumbar vertebra (L1) and the fourth lumbar vertebra (L4). This plexus is formed by the anterior rami of the spinal nerves from L1 to L4, and it gives rise to several important nerves that innervate the lower limbs and part of the pelvis. Nerves such as the femoral nerve and obturator nerve, both critical for motor and sensory functions in the thigh, originate from this plexus. Understanding the significance of the lumbar plexus is essential, as it plays a crucial role in the control of lower limb movement and sensation, aiding in activities such as walking and maintaining balance. Its anatomical location directly correlates to the regions of the body it serves, thereby emphasizing the connection between nerve plexus formation and physiological function.

5. What does the term 'decussation' refer to in the context of the nervous system?

- A. Nerves branching out
- B. Fibers crossing sides**
- C. Nerve repair process
- D. Signal transmission speed

The term 'decussation' in the context of the nervous system specifically refers to the crossing of nerve fibers from one side of the central nervous system to the other. This process is significant for several pathways, particularly in relation to sensory and motor systems. For example, in the case of the spinothalamic tract, which is involved in pain and temperature sensation, decussation occurs shortly after the sensory neurons enter the spinal cord, leading to the transmission of sensory feedback from one side of the body being processed in the opposite hemisphere of the brain. Decussation enhances our ability to integrate sensory and motor information across both sides of the body, allowing for coordinated movement and perception. This concept helps explain why damage to one side of the brain can affect functions on the opposite side of the body, which is critical for understanding various neurological conditions and injuries.

6. Which type of neuroglial cell is the most abundant and contributes to the blood-brain barrier?

- A. Ependymal cells
- B. Oligodendrocytes
- C. Astrocytes**
- D. Microglia

Astrocytes are the most abundant type of neuroglial cell in the central nervous system and play a crucial role in maintaining the blood-brain barrier. This barrier is essential for protecting the brain from potentially harmful substances that could be present in the bloodstream while allowing vital nutrients to pass through. Astrocytes have end-feet that encase the blood vessels in the brain, helping to regulate the exchange of substances between the blood and the brain tissue. This structural support and regulatory function are vital for maintaining the overall homeostasis of the neural environment, ensuring that neurons can function optimally without interference from toxins or pathogens. Additionally, astrocytes contribute to the repair process following CNS injury, support the metabolic needs of neurons, and regulate the extracellular ionic environment, which is key for proper neuronal signaling. Their multifaceted roles underscore their importance in both supporting neural function and contributing to the integrity of the blood-brain barrier.

7. What are myofibrils primarily composed of?

- A. Proteins and lipids
- B. Myofilaments**
- C. Nucleus and cytoplasm
- D. Bone and cartilage

Myofibrils are primarily composed of myofilaments, which are the contractile fibers found within muscle cells. These myofilaments consist of two main types: thick filaments, primarily made of the protein myosin, and thin filaments, primarily composed of the protein actin. The arrangement of these myofilaments within myofibrils is essential for muscle contraction, as they slide past one another during the contraction process, resulting in muscle shortening and generating force. This structural organization is critical for the functioning of skeletal muscle tissue, where myofibrils contribute to the overall muscle fiber's ability to contract and produce movement. Understanding this composition highlights the fundamental role myofibrils play in the mechanics of muscle function.

8. What is the main role of neuroglia or glial cells?

- A. Transmit signals quickly
- B. Support and protect neurons**
- C. Block infections in the CNS
- D. Conduct impulses

Neuroglia, or glial cells, are essential components of the nervous system that primarily function to support and protect neurons. Unlike neurons, which are responsible for transmitting signals and conducting impulses, glial cells provide a variety of critical support roles that contribute to the overall health and functionality of the nervous system. One of the primary roles of glial cells includes maintaining the homeostasis of the extracellular environment, which is crucial for the proper functioning of neurons. They do this by regulating ion concentrations, removing excess neurotransmitters, and providing metabolic support. Additionally, glial cells help to form myelin, which insulates axons and significantly increases the speed of electrical signal propagation in the nervous system. Glial cells also play a protective role in the central nervous system (CNS) by responding to injury and infection. They participate in the immune response of the CNS, although this is a part of their role in supporting neurons rather than their main function. Overall, the support and protection provided by neuroglia are vital to the proper functioning of the neural network, allowing neurons to focus on signal transmission.

9. Which of the following muscles is an example of a large motor unit?

- A. Eye muscles
- B. Hand muscles
- C. Gastrocnemius**
- D. Facial muscles

The gastrocnemius muscle serves as an example of a large motor unit due to its role in producing powerful movements, specifically during activities like running and jumping. Large motor units are characterized by a higher number of muscle fibers innervated by a single motor neuron, which enables the generation of greater force. The gastrocnemius, being one of the primary muscles in the calf, is associated with activities that require significant force and strength, thus it comprises larger motor units to effectively support these demanding movements. In contrast, muscles such as the eye muscles and hand muscles consist of small motor units. These small motor units allow for fine motor control and precision movements, which are essential for tasks like tracking visual stimuli and manipulating small objects. Facial muscles also typically contain smaller motor units, enabling subtle and intricate facial expressions. The distinction between large and small motor units is critical in understanding how different muscles perform their respective functions based on the demands of the activity.

10. The sacral nerve plexus consists of which spinal levels?

- A. C5-T1
- B. L1-L4
- C. L4, L5 and S1-S4**
- D. S4, S5, and C0

The sacral nerve plexus is comprised of the spinal levels L4, L5, and S1 through S4. This network of nerves is formed from the ventral rami of these spinal nerves, and it primarily serves the pelvic region and lower limbs. The inclusion of L4 and L5 is crucial as they contribute to the formation of the lumbosacral trunk, which merges with the sacral spinal nerves to constitute the plexus. The sacral nerve plexus is responsible for providing motor and sensory innervation to areas such as the buttocks, genital region, and posterior thigh, as well as the entire lower leg and foot through major nerves like the sciatic nerve. Understanding the specific spinal levels involved is essential for comprehending the anatomical layout of the nervous system and the pathways of nerve function related to the lower body.

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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.

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

<https://asu-bio201exam3.examzify.com>

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

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