

HESI A2 28 ANATOMY AND PHYSIOLOGY PRACTICE EXAM (SAMPLE)

STUDY GUIDE



Prepare with structure. Pass with confidence



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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 are bones classified?

- A. Based on color
- B. By age
- C. By shape
- D. By weight

2. What constitutes approximately 45% of the makeup of blood?

- A. Plasma
- B. Formed elements
- C. Water
- D. Whole blood

3. What is one role of the axon in the nervous system?

- A. Store neurotransmitters
- B. Transmit impulses toward the muscle tissues
- C. Conduct electrical impulses away from the neuron cell body
- D. Provide structural support to the neuron

4. Which bones are classified as part of the appendicular skeleton's lower section?

- A. Cervical vertebrae
- B. Pelvic girdle
- C. Thoracic vertebrae
- D. Sacrum

5. What is the enzyme found in saliva that initiates the digestion of complex carbohydrates?

- A. Protease
- B. Amylase
- C. Lipase
- D. Cellulase

6. Which term describes the system that includes the brain and spinal cord?

- A. Peripheral nervous system
- B. Cranial nervous system
- C. Central nervous system
- D. Autonomic nervous system

7. Which structures are included in the vascular system?

- A. Arteries, veins, capillaries
- B. Heart, arteries, capillaries
- C. Veins, capillaries, lymphatics
- D. Arteries, lymphatics, aorta

8. Which components make up the final part of the axial skeleton?

- A. The skull and vertebrae
- B. The thorax, the sternum, and ribs
- C. The pelvis and sacrum
- D. The cranial bones and facial bones

9. Where are myofibrils located within muscle cells?

- A. In the cytoplasm
- B. Within the sarcoplasmic reticulum
- C. At the surface membrane
- D. In the nucleus

10. What is stimulated in tissues when the concentration of oxygen decreases?

- A. Increase in hemoglobin affinity
- B. Release of oxygen from hemoglobin
- C. Decrease in carbon dioxide production
- D. Increase in respiratory rate

Answers

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

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Explanations

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1. How are bones classified?

- A. Based on color
- B. By age
- C. By shape**
- D. By weight

Bones are classified primarily by shape, and this classification helps in understanding their functions and structural characteristics. The major categories of bone shapes include long bones, short bones, flat bones, irregular bones, and sesamoid bones. Long bones, such as the femur and humerus, are characterized by a greater length than width and provide support and leverage for movement. Short bones, like those in the wrist and ankle, are roughly cube-shaped and provide stability and support while allowing for limited motion. Flat bones, such as the skull and ribs, serve protective functions and provide large areas for muscle attachment. Irregular bones, like the vertebrae, have complex shapes that suit specific functions. Lastly, sesamoid bones, such as the patella, develop within tendons and help with joint movement. Classifying bones by shape is essential in fields such as anatomy, orthopedics, and physical therapy, as it aids in understanding their roles in the body's overall structure and biomechanics.

2. What constitutes approximately 45% of the makeup of blood?

- A. Plasma
- B. Formed elements**
- C. Water
- D. Whole blood

The correct answer is that formed elements constitute approximately 45% of the makeup of blood. Formed elements include red blood cells, white blood cells, and platelets. Red blood cells are the most abundant type of formed element and are essential for transporting oxygen throughout the body. White blood cells play a crucial role in the immune response, while platelets are vital for blood clotting. In contrast, plasma, which is the liquid component of blood, accounts for about 55% of blood volume. Water, a major component of plasma, makes up around 90-92% of plasma itself but is not a standalone component of blood. Whole blood refers to the complete composition of blood, including both the plasma and the formed elements, and therefore does not specifically represent the percentage of formed elements alone.

3. What is one role of the axon in the nervous system?

- A. Store neurotransmitters
- B. Transmit impulses toward the muscle tissues
- C. Conduct electrical impulses away from the neuron cell body**
- D. Provide structural support to the neuron

The axon plays a crucial role in the nervous system by conducting electrical impulses away from the neuron cell body. This structure is essential because it enables the transmission of signals over distances, allowing communication between neurons and facilitating the coordination of functions throughout the body. The axon is typically long and slender, which helps it effectively carry electrical signals, known as action potentials, to other neurons, muscle cells, or glands. This process is vital for a wide range of bodily functions, including reflexes, voluntary movements, and complex cognitive tasks. The ability to transmit impulses efficiently is fundamental to the overall performance of the nervous system and its ability to respond to internal and external stimuli.

4. Which bones are classified as part of the appendicular skeleton's lower section?

- A. Cervical vertebrae
- B. Pelvic girdle**
- C. Thoracic vertebrae
- D. Sacrum

The bones that make up the appendicular skeleton's lower section include the pelvic girdle, which consists of the hip bones (ilium, ischium, and pubis) and plays a crucial role in supporting the weight of the upper body when standing and transferring that weight to the lower limbs during movement. The pelvic girdle also provides attachment points for the lower limbs and helps protect the organs located in the pelvic area. The other options pertain to different parts of the skeletal system. The cervical and thoracic vertebrae are part of the axial skeleton, which protects the brain and spinal cord, and supports the head and trunk. The sacrum, while located in the pelvic region, is also classified within the axial skeleton as it connects with the vertebral column. Thus, the pelvic girdle is the only structure listed that is specifically classified as part of the appendicular skeleton's lower section.

5. What is the enzyme found in saliva that initiates the digestion of complex carbohydrates?

- A. Protease
- B. Amylase**
- C. Lipase
- D. Cellulase

The enzyme that initiates the digestion of complex carbohydrates in saliva is amylase. Salivary amylase specifically targets starches, which are polysaccharides, breaking them down into simpler sugars like maltose and dextrin. This enzymatic activity begins the digestive process in the mouth before the food reaches the stomach and small intestine, where further digestion occurs. Amylase is crucial for the effective breakdown of carbohydrates, making it easier for the body to absorb and utilize these nutrients. This process is vital, as carbohydrates serve as a primary energy source for the body. The presence of amylase in saliva highlights the importance of enzymatic activity in the oral phase of digestion and the role of saliva in facilitating the overall digestive process.

6. Which term describes the system that includes the brain and spinal cord?

- A. Peripheral nervous system
- B. Cranial nervous system
- C. Central nervous system**
- D. Autonomic nervous system

The central nervous system is the term that accurately describes the system comprising both the brain and spinal cord. This system serves as the primary control center for the body, responsible for processing information and integrating sensory input. The brain processes data by interpreting sensory signals, issuing commands for voluntary movements, and managing complex functions such as cognition, memory, and emotion. The spinal cord facilitates communication between the brain and the rest of the body, relaying signals for reflex actions and other involuntary responses. This distinction is essential since the other options refer to different aspects of the nervous system. The peripheral nervous system encompasses all the nerves outside of the brain and spinal cord, including sensory and motor neurons that connect the central nervous system to limbs and organs. The cranial nervous system is not a standard term used in anatomy; however, it may refer informally to the cranial nerves that arise directly from the brain. The autonomic nervous system is a subdivision of the peripheral nervous system that regulates involuntary bodily functions, such as heart rate and digestion, but does not include the brain and spinal cord themselves. Therefore, the central nervous system is the correct designation for the combination of the brain and spinal cord.

7. Which structures are included in the vascular system?

- A. Arteries, veins, capillaries**
- B. Heart, arteries, capillaries
- C. Veins, capillaries, lymphatics
- D. Arteries, lymphatics, aorta

The vascular system is primarily composed of the network of blood vessels that are responsible for transporting blood throughout the body. This system includes arteries, veins, and capillaries. Arteries are responsible for carrying oxygen-rich blood away from the heart to the tissues. Veins return oxygen-poor blood back to the heart, while capillaries are small, thin-walled vessels that facilitate the exchange of oxygen, carbon dioxide, nutrients, and waste products between the blood and tissues. Together, these three components form a closed loop that is essential for maintaining proper circulation and ensuring that all body tissues receive adequate blood supply. While options might include structures like the heart and lymphatics, they do not encompass the complete set of vessels that constitute the vascular system. The heart is a muscular organ that pumps blood and is not part of the vascular vessels themselves, and lymphatics pertain to the lymphatic system, which is distinct from the vascular system.

8. Which components make up the final part of the axial skeleton?

- A. The skull and vertebrae
- B. The thorax, the sternum, and ribs**
- C. The pelvis and sacrum
- D. The cranial bones and facial bones

The final part of the axial skeleton is best represented by the thorax, which includes the sternum and ribs. The axial skeleton is responsible for supporting the body's weight and protecting the central nervous system and vital organs. The thorax plays a critical role in respiration by housing the lungs and heart, with the ribs providing a protective cage around these organs while also allowing for the expansion and contraction of the chest during breathing. The sternum, or breastbone, is the central bone to which the ribs connect, contributing to the stability and structure of the ribcage. In contrast, the skull and vertebrae, while part of the axial skeleton, represent earlier components rather than the final part. The pelvis and sacrum are classified as part of the appendicular skeleton, not the axial skeleton. Lastly, cranial and facial bones, while also integral to the skull structure, do not encompass the thoracic components that complete the axial skeleton.

9. Where are myofibrils located within muscle cells?

- A. In the cytoplasm**
- B. Within the sarcoplasmic reticulum
- C. At the surface membrane
- D. In the nucleus

Myofibrils are located in the cytoplasm of muscle cells, which is also known as sarcoplasm. These structures are crucial components of muscle fibers, as they are responsible for the contraction of the muscle through the organization of actin and myosin filaments. This arrangement allows for the sliding filament theory of muscle contraction to occur, where the filaments slide past each other to shorten the muscle fiber and generate force. The presence of myofibrils is essential for muscle functionality, as they make up the bulk of the muscle cell's structure, ensuring efficient contraction and relaxation during movement. Other options, such as the sarcoplasmic reticulum, primarily function to store calcium ions and regulate muscle contractions but do not contain myofibrils themselves. The surface membrane is important for signal transmission and maintaining the integrity of the muscle cell but does not house myofibrils either. Similarly, the nucleus, which contains the cell's genetic material, does not contain myofibrils, as these are specifically located in the cytoplasmic region where they can interact effectively with other cellular structures during the contraction process.

10. What is stimulated in tissues when the concentration of oxygen decreases?

- A. Increase in hemoglobin affinity
- B. Release of oxygen from hemoglobin**
- C. Decrease in carbon dioxide production
- D. Increase in respiratory rate

When the concentration of oxygen decreases in tissues, the body responds by promoting the release of oxygen from hemoglobin. This process is governed by the oxygen-hemoglobin dissociation curve, which illustrates how hemoglobin's affinity for oxygen changes with varying levels of oxygen saturation and other factors such as pH and carbon dioxide levels. In hypoxic conditions, where oxygen concentration is low, hemoglobin tends to release its bound oxygen more readily to meet the metabolic demands of tissues. The presence of elevated carbon dioxide and protons (lower pH) in the tissues further facilitates this release, enhancing oxygen delivery where it is most needed. This reaction is critical in ensuring that oxygen is supplied to cells for aerobic metabolism, especially when they require more energy due to increased activity or other physiological demands. By understanding this key physiological response, it becomes clear why the correct answer revolves around the concept of hemoglobin releasing oxygen when faced with decreased oxygen availability.

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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://hes1i2.examzify.com>

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

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