

HESI A2 28 ANATOMY AND PHYSIOLOGY PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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 structures make up the human nervous system?**
 - A. The heart, lungs, and blood
 - B. The brain, spinal cord, and nerves
 - C. The muscles and bones of the body
 - D. The skin, hair, and nails
- 2. What part of the neuron is primarily involved in integrating information?**
 - A. Axon
 - B. Dendrites
 - C. Cell body
 - D. Myelin sheath
- 3. When is oxygen released from hemoglobin?**
 - A. When oxygen levels are high in the blood
 - B. As the concentration of O₂ drops in tissues
 - C. Immediately upon entering the lungs
 - D. When carbon dioxide levels are high
- 4. What structures comprise the peripheral nervous system (PNS)?**
 - A. All the muscles in the body
 - B. All the nerves that transmit information to and from the CNS
 - C. Only the spinal cord
 - D. Only the brain
- 5. What protein is primarily responsible for binding O₂ in erythrocytes?**
 - A. Collagen
 - B. Hemoglobin
 - C. Myoglobin
 - D. Albumin
- 6. What are the three primary regions of the small intestine?**
 - A. Duodenum, Cecum, Ileum
 - B. Duodenum, Jejunum, Ileum
 - C. Jejunum, Ileum, Ascending colon
 - D. Duodenum, Rectum, Jejunum

- 7. What is one role of estrogen during the menstrual cycle?**
- A. It stimulates uterine contractions
 - B. It fosters the growth of the endometrium
 - C. It degrades the corpus luteum
 - D. It triggers ovulation
- 8. What is the effect of nonsteroid hormones on cells?**
- A. Change nuclear DNA directly
 - B. Activate second messengers
 - C. Store energy in cells
 - D. Produce heat
- 9. What type of joint are phalanges categorized as?**
- A. Ball-and-socket joints
 - B. Hinge joints
 - C. Pivot joints
 - D. Gliding joints
- 10. Which condition is most associated with excess leukocyte activity?**
- A. Aging
 - B. Infection
 - C. Dehydration
 - D. High blood pressure

Answers

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

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Explanations

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1. Which structures make up the human nervous system?

- A. The heart, lungs, and blood
- B. The brain, spinal cord, and nerves**
- C. The muscles and bones of the body
- D. The skin, hair, and nails

The human nervous system consists of the brain, spinal cord, and nerves, which together facilitate communication throughout the body and coordinate responses to internal and external stimuli. The brain serves as the central control center, processing sensory information and coordinating actions. The spinal cord acts as a major conduit for information traveling between the brain and the rest of the body, playing a crucial role in reflexes. Nerves extend from the spinal cord to various parts of the body, transmitting signals that regulate bodily functions, movements, and sensory perceptions. Other options do not pertain to the nervous system. The heart, lungs, and blood are components of the circulatory system, responsible for blood circulation and oxygen delivery. Muscles and bones make up the muscular and skeletal systems, providing structure and enabling movement. Skin, hair, and nails are components of the integumentary system that protects the body and regulates temperature. Therefore, the correct answer reflects the specific structures that constitute the nervous system.

2. What part of the neuron is primarily involved in integrating information?

- A. Axon
- B. Dendrites
- C. Cell body**
- D. Myelin sheath

The cell body, or soma, of a neuron plays a crucial role in integrating information received from the dendrites. Dendrites are extensions of the neuron that receive signals from other neurons and sensory receptors. These incoming signals can be excitatory or inhibitory, and the cell body integrates all of these inputs to determine whether the neuron will fire an action potential. The cell body contains the nucleus and other organelles necessary for the maintenance and functioning of the neuron. After processing the signals received, if the overall input surpasses a certain threshold, the cell body generates an action potential that travels down the axon to communicate with other neurons or effectors. This integration process is essential for understanding and responding to stimuli in the environment, making the cell body the primary site for information integration within the neuron.

3. When is oxygen released from hemoglobin?

- A. When oxygen levels are high in the blood
- B. As the concentration of O₂ drops in tissues**
- C. Immediately upon entering the lungs
- D. When carbon dioxide levels are high

Oxygen is released from hemoglobin primarily when the concentration of oxygen decreases in the surrounding tissues. This physiological phenomenon is crucial for cellular respiration, as it allows for the delivery of oxygen where it is most needed. In the tissues, especially those that are metabolically active, oxygen is consumed for cellular processes, leading to a drop in the local concentration of oxygen. As a result, hemoglobin, which carries oxygen in the bloodstream, more readily releases its oxygen in these areas to meet the metabolic demands of the cells. This release is influenced by several factors, including temperature, pH, and the concentration of carbon dioxide, which can affect hemoglobin's affinity for oxygen. Understanding this mechanism is essential in comprehending how oxygen transport and delivery operate in the body, ensuring that tissues receive sufficient oxygen while maintaining proper pH and carbon dioxide levels within the blood.

4. What structures comprise the peripheral nervous system (PNS)?

- A. All the muscles in the body
- B. All the nerves that transmit information to and from the CNS**
- C. Only the spinal cord
- D. Only the brain

The correct answer emphasizes that the peripheral nervous system (PNS) includes all the nerves that transmit information to and from the central nervous system (CNS), which consists of the brain and spinal cord. The PNS is made up of two main components: the cranial nerves, which emerge directly from the brain, and the spinal nerves, which originate from the spinal cord. These nerves are responsible for relaying sensory information to the CNS and conveying motor commands from the CNS to the rest of the body, thereby playing a crucial role in the communication between the central nervous system and the peripheral tissues, such as muscles and organs. In contrast, other choices either limit the scope of the PNS or misidentify its components. The choice mentioning all the muscles in the body does not accurately represent the PNS, as muscles are not part of the nervous system; rather, they are effectors innervated by nerves. The options suggesting only the spinal cord or the brain misrepresent the PNS as they are both components of the CNS, while the PNS specifically includes the neural structures that extend beyond the CNS to connect to the rest of the body. This distinction is essential in understanding how the nervous system operates as a whole.

5. What protein is primarily responsible for binding O₂ in erythrocytes?

- A. Collagen
- B. Hemoglobin**
- C. Myoglobin
- D. Albumin

Hemoglobin is the protein primarily responsible for binding oxygen in erythrocytes, or red blood cells. It is a globular protein composed of four subunits, each containing a heme group. These heme groups have iron at their center, which is essential for the reversible binding of oxygen molecules. This structure allows hemoglobin to pick up oxygen in the lungs, where the oxygen concentration is high, and transport it to tissues throughout the body, where oxygen is utilized for cellular respiration. This efficient transport mechanism is critical for maintaining oxygen supply to all body tissues, contributing to cellular metabolism and energy production. Hemoglobin's affinity for oxygen changes depending on several factors, such as pH and carbon dioxide concentration, allowing for effective delivery of oxygen where it is most needed. Other proteins listed, such as collagen, myoglobin, and albumin, have different roles in the body. Collagen is primarily involved in providing structural support in tissues, myoglobin serves to store oxygen in muscle tissue, and albumin functions mainly as a carrier protein in the bloodstream, helping to maintain osmotic pressure and transport various substances. None of these proteins have the specialized function that hemoglobin has in binding and transporting oxygen in erythrocytes.

6. What are the three primary regions of the small intestine?

- A. Duodenum, Cecum, Ileum
- B. Duodenum, Jejunum, Ileum**
- C. Jejunum, Ileum, Ascending colon
- D. Duodenum, Rectum, Jejunum

The three primary regions of the small intestine are the duodenum, jejunum, and ileum. This sequential organization reflects the functional and anatomical progression of the small intestine. The duodenum is the first section of the small intestine, directly connected to the stomach. It plays a critical role in digestion, as it receives chyme from the stomach along with bile from the liver and pancreatic juices from the pancreas, which help to further break down food. Following the duodenum is the jejunum, which is primarily responsible for the absorption of nutrients. It is characterized by a greater vascular supply and a higher surface area, thanks to its numerous folds and villi, which optimize nutrient absorption into the bloodstream. Lastly, the ileum serves as the last section of the small intestine and continues the process of nutrient absorption, particularly vitamin B12 and bile salts. It also connects to the large intestine at the ileocecal valve. This anatomical classification highlights the distinct roles each section plays in the digestive process, which aligns with the physiological functions characterized by their specialized structures.

7. What is one role of estrogen during the menstrual cycle?

- A. It stimulates uterine contractions
- B. It fosters the growth of the endometrium**
- C. It degrades the corpus luteum
- D. It triggers ovulation

During the menstrual cycle, one of the primary roles of estrogen is to foster the growth of the endometrium, which is the inner lining of the uterus. At the beginning of the cycle, levels of estrogen increase in response to the developing ovarian follicles. This rise in estrogen prompts the thickening and proliferation of the endometrial tissue in preparation for a potential implantation of a fertilized egg. Estrogen is crucial for creating an optimal environment for a potential pregnancy by enhancing the vascularity and nutrient supply of the endometrium. As the cycle progresses, particularly in the follicular phase, the secretion of estrogen continues to support the growth of the endometrium, making it receptive for implantation if fertilization occurs. Once ovulation takes place and if conception does not occur, the decline in estrogen levels leads to the shedding of the endometrial lining during menstruation. This physiological function highlights the essential nature of estrogen in preparing the uterus for possible early stages of pregnancy.

8. What is the effect of nonsteroid hormones on cells?

- A. Change nuclear DNA directly
- B. Activate second messengers**
- C. Store energy in cells
- D. Produce heat

Nonsteroid hormones exert their effects on cells by primarily activating second messengers. These hormones are typically water-soluble and cannot pass through the lipid bilayer of the cell membrane. Instead, they bind to specific receptors on the cell surface, triggering a cascade of intracellular events through the activation of second messenger systems, such as cyclic AMP (cAMP) or calcium ions. Once the hormone binds to its receptor, it initiates a signal transduction pathway that amplifies the hormonal signal and leads to various biological responses within the cell. This can include changes in enzyme activity, regulation of gene expression, or alterations in cellular metabolism, among other functions. The use of second messengers is crucial for these hormones, as it allows them to exert their effects without needing to enter the cell directly. The other options do not accurately reflect the mechanism of action of nonsteroid hormones. They do not change nuclear DNA directly since that requires specific interactions with steroid hormones, which do have the ability to pass through the cell membrane and bind to nuclear receptors. Nonsteroid hormones also do not work to store energy in cells or produce heat as their primary functions, though the metabolic changes they induce could indirectly influence energy utilization.

9. What type of joint are phalanges categorized as?

- A. Ball-and-socket joints
- B. Hinge joints**
- C. Pivot joints
- D. Gliding joints

Phalanges, the bones in the fingers and toes, are categorized as hinge joints. Hinge joints are characterized by allowing movement primarily in one plane, similar to the motion of a door being opened and closed. This single-plane motion enables the bending and straightening of the fingers and toes, which is essential for gripping and walking. In the case of the phalanges, they allow for flexion and extension at the interphalangeal joints (the joints between adjacent phalanges), which are critical for the dexterity of the fingers and the functioning of the toes in walking. The structure of these joints, with their specific ligaments and surrounding tissues, supports this type of movement effectively. Other joint types such as ball-and-socket joints, pivot joints, and gliding joints offer different ranges of movement and functionalities that do not match the specific motions provided by the phalanges. Ball-and-socket joints, for instance, allow for multi-directional movement and rotation, which is not applicable to the phalanges. Pivot joints primarily enable rotational movements, while gliding joints allow bones to slide past each other, none of which accurately describe the functional characteristics of the phalangeal joints.

10. Which condition is most associated with excess leukocyte activity?

- A. Aging
- B. Infection**
- C. Dehydration
- D. High blood pressure

Excess leukocyte activity is primarily associated with infection because when the body detects the presence of pathogens such as bacteria, viruses, or fungi, the immune system responds by increasing the production and activation of leukocytes, or white blood cells. These cells play a critical role in identifying, attacking, and eliminating infectious agents. This heightened activity is part of the inflammatory response, which is essential for controlling and clearing infections. During an infection, various types of leukocytes, including neutrophils, lymphocytes, and macrophages, are mobilized to the site of infection, leading to an increase in their numbers and activity levels. This process helps to efficiently orchestrate the body's defense mechanisms, enabling a robust response to clear the infection. In contrast to the other options, which do not directly correlate with an increase specifically tied to leukocyte activity, infections present a clear physiological scenario where leukocyte activity is heightened as part of the immune response.

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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