HESI A2 28 Anatomy and Physiology Practice Exam (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

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

A. Collagen

B. Hemoglobin

C. Myoglobin

D. Albumin

2. What is the significance of tropic hormones in relation to sex organ function?

A. They regulate metabolic rates

B. They stimulate sex organ growth and hormone production

C. They control blood sugar levels

D. They enhance the immune response

3. What structures make up the pathways for sperm during ejaculation?

A. The urethra and the prostate gland

B. The vas deferens, ejaculatory duct, and urethra

C. The seminiferous tubules and epididymis

D. The scrotum and testosterone

4. 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

5. Where are mature sperm stored in the male reproductive system?

A. The seminiferous tubules

B. The prostate gland

C. The epididymis

D. The scrotum

6. What are considered the functional units of the nervous system?

A. Neurons

B. Muscles

C. Glands

D. Organs

7. What is the most common type of dietary fat?

A. Unsaturated fats

B. Saturated fats

C. Trans fats

D. Omega-3 fatty acids

8. What is the name for the relaxation phase of the cardiac cycle?

A. Systole

B. Diastole

C. Isovolumetric relaxation

D. Atria phase

9. What is the primary bone of the upper arm?

A. Radius

B. Ulna

C. Humerus

D. Carpals

10. 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

Answers

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

Explanations

1. 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.

2. What is the significance of tropic hormones in relation to sex organ function?

A. They regulate metabolic rates

B. They stimulate sex organ growth and hormone production

C. They control blood sugar levels

D. They enhance the immune response

Tropic hormones are crucial because they act primarily on other endocrine glands to stimulate them to produce hormones that affect various functions in the body. In the context of sex organ function, tropic hormones such as luteinizing hormone (LH) and follicle-stimulating hormone (FSH) specifically target the gonads—the ovaries in females and the testes in males. These hormones promote the growth and development of the sex organs, facilitating the production of sex hormones like estrogen and testosterone. Estrogen plays a significant role in female reproductive health, influencing processes such as the menstrual cycle and pregnancy, while testosterone is essential for male reproductive functions, affecting sperm production and the development of male secondary sexual characteristics. The role of tropic hormones underscores the interconnected nature of the endocrine system, where the influence on one gland can significantly impact overall physiological processes related to growth, development, and reproduction.

3. What structures make up the pathways for sperm during ejaculation?

A. The urethra and the prostate gland

B. The vas deferens, ejaculatory duct, and urethra

C. The seminiferous tubules and epididymis

D. The scrotum and testosterone

The correct answer is founded on the specific anatomical structures involved in the journey of sperm during ejaculation. The pathways for sperm to exit the male reproductive system consist of the vas deferens, the ejaculatory duct, and the urethra. During ejaculation, sperm are transported from the seminiferous tubules, where they are produced and matured, into the epididymis for storage. When ejaculation occurs, the sperm move from the epididymis through the vas deferens, which is a muscular tube that propels sperm towards the ejaculatory duct. The ejaculatory duct is formed by the union of the vas deferens and the seminal vesicle's duct, allowing the sperm to mix with seminal fluid before entering the urethra. Finally, the sperm travel through the urethra, which is the final pathway leading out of the body. This sequence of structures is vital for the successful transfer of sperm during ejaculation, highlighting the interconnected roles of these pathways in reproductive function. Understanding these connections is crucial in grasping the male reproductive system's anatomy and physiology.

4. 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.

5. Where are mature sperm stored in the male reproductive system?

A. The seminiferous tubules

B. The prostate gland

C. The epididymis

D. The scrotum

Mature sperm are stored in the epididymis, which is a coiled tube that runs along the back of each testis. This structure plays a crucial role in the maturation of sperm cells, allowing them to gain the motility needed for fertilization. As sperm travel through the epididymis, they undergo various changes that prepare them for their journey through the male reproductive system and eventual fertilization of an egg. The seminiferous tubules are where sperm are produced through a process called spermatogenesis, but mature sperm are not stored there. The prostate gland is involved in the production of seminal fluid and plays a role in ejaculation but does not serve as a storage site for mature sperm. The scrotum is the external pouch that holds the testes, providing a temperature-controlled environment for sperm production but is not a storage location for mature sperm themselves. Thus, the epididymis is the correct answer, as it specifically serves the function of storing and maturing sperm until they are ready for ejaculation.

6. What are considered the functional units of the nervous system?

A. Neurons

B. Muscles

C. Glands

D. Organs

Neurons are considered the functional units of the nervous system because they are specialized cells responsible for transmitting information throughout the body via electrical and chemical signals. Each neuron consists of a cell body, dendrites, and an axon, allowing them to receive input from other neurons, process that information, and send signals to other neurons, muscles, or glands. This intricate communication network is essential for various functions including reflexes, sensory perception, and cognitive processes. While muscles, glands, and organs play important roles in the overall functioning of the body, they do not directly facilitate the transmission of signals or processing of information in the way that neurons do. Muscles are responsible for movement, glands secrete hormones and other substances, and organs perform specific functions required for homeostasis. Therefore, the unique properties and roles of neurons distinctly position them as the foundational components of the nervous system.

7. What is the most common type of dietary fat?

A. Unsaturated fats

B. Saturated fats

C. Trans fats

D. Omega-3 fatty acids

The most common type of dietary fat is unsaturated fats. These fats are primarily found in plant-based oils, nuts, seeds, avocados, and fatty fish. Unsaturated fats can be further categorized into monounsaturated and polyunsaturated fats, both of which are considered healthier options compared to other types of fats. They are known for their beneficial effects on heart health, as they can help lower bad cholesterol levels, reduce inflammation, and provide essential fatty acids that the body cannot produce on its own. In contrast, saturated fats, though present in the diet, are found in higher quantities in animal products and some tropical oils. While they can be consumed in moderation, health guidelines generally recommend limiting saturated fat intake due to its association with an increased risk of heart disease. Trans fats are industrially created and are linked with negative health impacts; they are often found in processed foods. Omega-3 fatty acids, while essential and beneficial for health, are a specific type of polyunsaturated fat rather than a broad category like unsaturated fats. Therefore, unsaturated fats are considered the most common and healthier choice in the typical diet.

8. What is the name for the relaxation phase of the cardiac cycle?

A. Systole

B. Diastole

C. Isovolumetric relaxation

D. Atria phase

The relaxation phase of the cardiac cycle is referred to as diastole. During diastole, the heart muscles relax, allowing the chambers of the heart, specifically the atria and ventricles, to fill with blood. This phase is crucial for effective circulation, as it prepares the heart to pump blood efficiently during the subsequent contraction phase, known as systole. At this stage, the heart experiences a decrease in pressure allowing the mitral and tricuspid valves to open, enabling blood to flow from the atria to the ventricles. In contrast, systole refers to the contraction phase where the heart pumps blood out to the body. Isovolumetric relaxation is a specific aspect of diastole but does not encompass the entire relaxation phase of the cardiac cycle. The term "atria phase" is not a recognized phase in the standard terminology of the cardiac cycle. Thus, diastole aptly captures the entire process of relaxation that is critical for the heart's function.

9. What is the primary bone of the upper arm?

A. Radius

B. Ulna

C. Humerus

D. Carpals

The primary bone of the upper arm is the humerus. This long bone extends from the shoulder to the elbow and plays a crucial role in the function and movement of the arm. It serves as an attachment site for many muscles responsible for shoulder and elbow movements. The proximal end of the humerus fits into the glenoid cavity of the scapula, forming the shoulder joint, while the distal end connects with the radius and ulna at the elbow joint. This structure allows for a wide range of motion, including flexion, extension, and rotation in the arm. In contrast, the radius and ulna are located in the forearm and primarily function in the movement and stabilization of the wrist and hand. The carpal bones make up the wrist and do not contribute to the structure of the upper arm. Understanding the anatomy of these bones is essential for comprehending how the upper limb operates as a whole.

10. 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.

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!