HESI A2 SCIENCE PRACTICE TEST (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.

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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!

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Questions

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1. What is the role of the large intestine in the digestive system?

A. To absorb water and electrolytes from indigestible food matter
B. To chemically digest carbohydrates
C. To produce bile for fat digestion
D. To store waste products before excretion

2. What mechanism is applied when skeletal muscle contracts?

A. Sliding-filament mechanism
B. Cross-bridge cycle
C. Muscle spindle reflex
D. Motor unit recruitment

3. What role does hemoglobin play in respiratory function?

A. It helps to filter air in the lungs
B. It binds oxygen and transports it in the bloodstream
C. It enhances carbon dioxide exhalation
D. It produces energy during respiration

4. What term describes the photosynthesis process involving plants?

A. Respiration
B. Photosynthesis
C. Cytokinesis
D. Fermentation

5. What role does the lymphatic system play in the body?

A. To produce hormones
B. To transport lymph and help fight infections
C. To circulate oxygen
D. To filter toxins

6. On the periodic table, what element is represented by the symbol Sn?

A. Lead
B. Tin
C. Silver
D. Iron

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7. What is the primary function of capillaries?

A. Transport blood away from the heart
B. Gas exchange between blood and tissues
C. Regulate blood pressure
D. Store blood cells

8. What is the primary role of the immune system?

A. To filter blood and produce urine
B. To protect the body against pathogens and foreign substances
C. To facilitate the exchange of gases in the lungs
D. To regulate bodily functions through hormones

9. What process is primarily regulated by thyroid hormones?

A. Digestion
B. Metabolism and energy production
C. Cognitive function
D. Immune response

10. What is the primary source of energy for the human body?

A. Fatty acids
B. Proteins
C. Glucose
D. Vitamins

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Answers

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

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Explanations

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1. What is the role of the large intestine in the digestive system?

A. To absorb water and electrolytes from indigestible food matter

B. To chemically digest carbohydrates

C. To produce bile for fat digestion

D. To store waste products before excretion

The large intestine plays a crucial role in the digestive system primarily by absorbing water and electrolytes from indigestible food matter. As food passes through the digestive tract, much of the nutrients are absorbed in the small intestine. By the time the undigested material reaches the large intestine, its main function is to reclaim valuable water and salts, thereby preventing dehydration and maintaining electrolyte balance. This process converts the remaining material into a more solid form, preparing it for excretion. While the large intestine does assist in the storage of waste products before they are excreted, its primary function centers around the absorption processes—making the first option the most accurate description of its role. Other choices, such as the chemical digestion of carbohydrates and production of bile, are functions performed by different parts of the digestive system, specifically the small intestine and liver respectively, which do not take place in the large intestine.

2. What mechanism is applied when skeletal muscle contracts?

A. Sliding-filament mechanism

B. Cross-bridge cycle

C. Muscle spindle reflex

D. Motor unit recruitment

The sliding-filament mechanism is the correct description of how skeletal muscle contracts. In this process, the actin and myosin filaments within the muscle fibers slide past one another, leading to contraction. When a muscle is stimulated by a nerve impulse, the myosin heads attach to specific binding sites on the actin filaments, forming cross-bridges. The myosin heads then pivot, pulling the actin filaments towards the center of the sarcomere, which is the basic contractile unit of muscle fibers. This action shortens the muscle, generating force and movement. The sliding-filament mechanism is crucial for muscle contraction, as it simplifies the understanding of how muscles can produce force and change length during various types of contraction—whether that's lifting a weight or performing athletic movements. Other options relate to different aspects of muscle function or regulation. For example, the cross-bridge cycle specifically refers to the series of events during the contraction process when the myosin heads bind, pivot, and release from actin; it is part of the broader sliding-filament mechanism. Meanwhile, the muscle spindle reflex pertains to the sensory mechanism that helps maintain muscle tone and protect muscles from injury, and motor unit recruitment involves the activation of additional motor units to increase

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3. What role does hemoglobin play in respiratory function?

A. It helps to filter air in the lungs

B. It binds oxygen and transports it in the bloodstream

C. It enhances carbon dioxide exhalation

D. It produces energy during respiration

Hemoglobin plays a crucial role in respiratory function by binding oxygen in the lungs and transporting it through the bloodstream to the tissues and organs that need it. This protein, found within red blood cells, has a unique ability to pick up oxygen where it is abundant—specifically in the alveoli of the lungs— and release it in areas where the oxygen concentration is lower, such as in the body's tissues. The process begins when oxygen enters the lungs and diffuses across the alveolar membrane into the blood. Hemoglobin molecules then bind to this oxygen, forming oxyhemoglobin. This oxygen-rich blood is then pumped by the heart to all parts of the body, where the oxygen is released for cellular use, supporting functions like metabolism and energy production. The other options incorrectly assign roles to hemoglobin. It does not filter air in the lungs, enhance carbon dioxide exhalation, or produce energy during respiration; its primary function is centered on the transport of oxygen. Thus, the importance of hemoglobin in facilitating the efficient delivery of oxygen is essential for sustaining life and supporting various biological processes.

4. What term describes the photosynthesis process involving plants?

A. Respiration

B. Photosynthesis

C. Cytokinesis

D. Fermentation

Photosynthesis is the process by which green plants, algae, and some bacteria convert light energy into chemical energy, typically in the form of glucose, using carbon dioxide and water as raw materials. During this process, chlorophyll in plant cells captures sunlight, which fuels the transformation of CO_2 and H_2O into glucose and oxygen. This not only supports the plant's growth and energy needs but also plays a crucial role in the Earth's ecosystem by producing oxygen and serving as a foundational energy source for nearly all life forms. The other terms listed refer to different biological processes that do not involve the conversion of solar energy into chemical energy. Respiration, for instance, is the process by which organisms convert glucose and oxygen into energy, CO_2, and water, acting in some ways as the opposite of photosynthesis. Cytokinesis refers to the division of a cell's cytoplasm during cell division, while fermentation is a metabolic process that occurs in the absence of oxygen, allowing for energy production in some organisms but not involving the photosynthesis pathway.

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5. What role does the lymphatic system play in the body?

A. To produce hormones

B. To transport lymph and help fight infections

C. To circulate oxygen

D. To filter toxins

The lymphatic system plays a crucial role in maintaining the body's immune function and fluid balance by transporting lymph, which is a fluid that contains infection-fighting white blood cells. This system collects excess fluid from tissues, filters it through lymph nodes (where pathogens are detected and fought), and returns it to the bloodstream. By facilitating the movement of lymph and engaging in the immune response, the lymphatic system helps to protect the body from infections and diseases. While other systems in the body are responsible for hormone production, oxygen circulation, and toxin filtration, these functions are not primarily associated with the lymphatic system. Hormones are typically produced by endocrine glands, oxygen is circulated by the cardiovascular system through red blood cells, and the liver and kidneys are more involved in filtering toxins from the body. Thus, the primary function of the lymphatic system is indeed to transport lymph and aid in combating infections.

6. On the periodic table, what element is represented by the symbol Sn?

A. Lead

B. Tin

C. Silver

D. Iron

The symbol Sn on the periodic table represents the element tin. This abbreviation comes from the Latin name for tin, which is "stannum." Each element has a unique one- or two-letter symbol that reflects its name, either in English or in a historical or Latin context. Tin is a post-transition metal known for its malleability and resistance to corrosion, which makes it useful in various applications such as soldering, plating, and manufacturing alloys. Understanding the symbols of elements is essential for studying chemistry, as it allows for easier communication about chemical compounds and reactions.

7. What is the primary function of capillaries?

A. Transport blood away from the heart

B. Gas exchange between blood and tissues

C. Regulate blood pressure

D. Store blood cells

The primary function of capillaries is to facilitate gas exchange between blood and tissues. Capillaries are the smallest blood vessels in the body and they connect arterioles (which carry blood away from the heart) with venules (which carry blood back to the heart). Their walls are extremely thin, allowing oxygen and carbon dioxide, as well as nutrients and waste products, to pass through easily. This exchange process occurs via diffusion, where oxygen from the blood passes through the capillary walls into the surrounding tissues, which require it for cellular respiration. Simultaneously, carbon dioxide, a waste product of metabolism in tissues, diffuses from the tissue cells into the capillaries to be transported back to the lungs for exhalation. While other options, such as transporting blood and regulating blood pressure, are functions related to the overall circulatory system, these processes involve different types of blood vessels—arteries and veins. Capillaries specifically specialize in the exchange of gases and metabolites, which is crucial for maintaining tissue health and functionality. Thus, the correct answer to the question highlights the role of capillaries in ensuring that tissues receive the necessary substances for metabolism while also removing waste products efficiently.

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8. What is the primary role of the immune system?

A. To filter blood and produce urine

B. To protect the body against pathogens and foreign substances

C. To facilitate the exchange of gases in the lungs

D. To regulate bodily functions through hormones

The primary role of the immune system is to protect the body against pathogens and foreign substances. The immune system achieves this through a complex network of cells, tissues, and organs that work together to identify and neutralize harmful invaders such as bacteria, viruses, and parasites. Key components of the immune system include white blood cells, antibodies, and lymphatic tissues, all of which play vital roles in detecting and responding to infections. When a pathogen enters the body, the immune system activates various responses, including the production of antibodies that specifically target the invader and the mobilization of immune cells that can directly attack and destroy it. This defense not only helps to eliminate current infections but also contributes to long-term immunity against future infections by remembering specific pathogens. The other choices represent different bodily functions. Filtration of blood and urine production is mainly the role of the kidneys, while facilitating gas exchange in the lungs involves the respiratory system. Regulating bodily functions through hormones pertains to the endocrine system. Each of these systems plays crucial roles, but they do not encompass the protective functions provided by the immune system.

9. What process is primarily regulated by thyroid hormones?

A. Digestion

B. Metabolism and energy production

C. Cognitive function

D. Immune response

Thyroid hormones, primarily thyroxine (T4) and triiodothyronine (T3), play a crucial role in regulating metabolism and energy production within the body. These hormones influence various metabolic processes, including the rate of glucose consumption, the synthesis of proteins, and the breakdown of fats. By increasing the metabolic rate, thyroid hormones facilitate energy production, which is essential for maintaining homeostasis, supporting growth, and allowing for normal physical activity. The impact of thyroid hormones on metabolism is broad, affecting how the body utilizes nutrients and manages energy levels. For instance, they stimulate the metabolism of carbohydrates and fats, ensuring that the body efficiently converts food into energy. This regulation is particularly important for maintaining body weight, energy levels, and overall health. The other options, while important physiological processes, are not primarily regulated by thyroid hormones. Digestion is more closely tied to hormones such as gastrin and insulin. Cognitive function is influenced by various neurotransmitters and hormones, not solely thyroid hormones. The immune response is also regulated by other factors, including cytokines and immune cells, rather than thyroid hormones directly.

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10. What is the primary source of energy for the human body?

A. Fatty acids

B. Proteins

C. Glucose

D. Vitamins

The primary source of energy for the human body is glucose. This simple sugar is a crucial carbohydrate that is utilized by cells throughout the body to produce energy, primarily in the form of adenosine triphosphate (ATP). Glucose is readily available in the bloodstream and can be quickly converted to energy when needed, which is essential for supporting metabolic processes and physical activity. While fatty acids and proteins can also serve as sources of energy, they are not the body's preferred method for immediate energy. Fatty acids are typically used during prolonged exercise or periods of fasting when glucose availability is low. Proteins are primarily used for tissue repair, growth, and other vital functions rather than as a direct energy source. Vitamins, on the other hand, do not provide energy themselves; they play crucial roles as coenzymes and in various metabolic processes that facilitate the utilization of energy derived from carbohydrates, fats, and proteins. Therefore, glucose stands out as the primary and most readily accessible energy source for the human 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://hesia2science.examzify.com

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

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