

HESI A2 SCIENCE PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	15

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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. What is the basic structure of an amino acid?**
 - A. A protein and a lipid
 - B. A central carbon atom, an amino group, a carboxyl group, and a variable R group
 - C. A phosphate group and a sugar
 - D. A nitrogen base and a ribose
- 2. What is the main role of the cerebellum in the brain?**
 - A. Language processing
 - B. Motor control and coordination
 - C. Emotion regulation
 - D. Memory consolidation
- 3. The specific scientific name of an organism is identified by what two classifications?**
 - A. Family and genus
 - B. Order and species
 - C. Kingdom and phylum
 - D. Class and order
- 4. What two structures compose the central nervous system?**
 - A. Brain and Heart
 - B. Brain and Spinal Cord
 - C. Spinal Cord and Nerves
 - D. Spinal Cord and Neurons
- 5. What pH level indicates that a solution is alkaline?**
 - A. Below 7.0
 - B. Exactly 7.0
 - C. Higher than 7.0
 - D. None of the above

- 6. Which part of the brain is responsible for regulating balance and coordination?**
- A. Cerebrum
 - B. Cerebellum
 - C. Brainstem
 - D. Thalamus
- 7. What is the process of cytoplasm division during plant cell replication called?**
- A. Mitosis
 - B. Cytokinesis
 - C. Meiosis
 - D. Photosynthesis
- 8. What type of sugar is glucose classified as?**
- A. Complex Sugar
 - B. Simple Sugar
 - C. Disaccharide
 - D. Polysaccharide
- 9. Which of the following is not a function of the kidneys?**
- A. Regulating blood pressure
 - B. Secreting enzymes
 - C. Removing waste products
 - D. Regulating electrolyte balance
- 10. What is the primary function of red blood cells?**
- A. Transmitting nerve impulses
 - B. Transporting oxygen
 - C. Producing hormones
 - D. Fighting infections

Answers

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

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Explanations

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1. What is the basic structure of an amino acid?

- A. A protein and a lipid
- B. A central carbon atom, an amino group, a carboxyl group, and a variable R group**
- C. A phosphate group and a sugar
- D. A nitrogen base and a ribose

The basic structure of an amino acid consists of a central carbon atom, an amino group, a carboxyl group, and a variable R group. This structure is fundamental to the formation of proteins, as amino acids are the building blocks that link together through peptide bonds to form polypeptides. The central carbon atom, often referred to as the alpha carbon, is the core of the amino acid. The amino group (-NH₂) and the carboxyl group (-COOH) are functional groups that define the molecule as an amino acid. The amino group contributes basic properties, while the carboxyl group provides acidity. The R group, which varies between different amino acids, determines the unique characteristics of each amino acid, such as hydrophilicity or hydrophobicity, charge, and reactivity. This variability is key in how proteins adopt their structures and perform their functions in biological systems. The other choices include components that are not related to the structure of an amino acid. Proteins and lipids are macromolecules formed by amino acids and fatty acids respectively. A phosphate group and sugar are found in nucleotides, the building blocks of nucleic acids like DNA and RNA. Lastly, while nitrogen bases and ribose are parts

2. What is the main role of the cerebellum in the brain?

- A. Language processing
- B. Motor control and coordination**
- C. Emotion regulation
- D. Memory consolidation

The main role of the cerebellum is in motor control and coordination. It is a structure located at the back of the brain, and it plays a crucial role in the planning and execution of voluntary movements. The cerebellum receives input from sensory systems and other parts of the brain and uses this information to fine-tune motor activity, ensuring smooth and coordinated muscle movements. When an individual performs tasks that require precision, such as playing a musical instrument or participating in sports, the cerebellum is actively engaged in adjusting movements based on feedback to maintain balance and posture. Additionally, it is involved in motor learning, helping to refine skills through practice and repetition. Understanding the cerebellum's role is essential for recognizing how different brain regions contribute to various functions, including distinguishing it from areas responsible for language processing, emotion regulation, or memory consolidation. These other functions are managed by different parts of the brain, highlighting the specialized roles of each area in overall brain function.

3. The specific scientific name of an organism is identified by what two classifications?

- A. Family and genus
- B. Order and species**
- C. Kingdom and phylum
- D. Class and order

*The specific scientific name of an organism is identified using the genus and species classifications. This system, known as binomial nomenclature, was developed by Carl Linnaeus. The genus is the first part of the name and provides the broader category that the organism belongs to, while the species is the second part that identifies the specific organism within that genus. For example, in the scientific name *Homo sapiens*, *Homo* represents the genus, and *sapiens* denotes the species. This two-part naming system helps to avoid confusion and allows for a standardized way of identifying organisms across different languages and regions. In this context, options involving "Family," "Order," "Kingdom," and "Class" refer to broader taxonomic ranks that categorize organisms but do not specifically identify them in the same precise manner as the genus and species do.*

4. What two structures compose the central nervous system?

- A. Brain and Heart
- B. Brain and Spinal Cord**
- C. Spinal Cord and Nerves
- D. Spinal Cord and Neurons

The central nervous system (CNS) is composed of two primary structures: the brain and the spinal cord. The brain serves as the control center for processing information, coordinating movements, and regulating functions of the body, while the spinal cord acts as a communication highway that transmits signals between the brain and the rest of the body. This combination enables the CNS to effectively manage and integrate all neural activities. Other options presented do not correctly identify the components of the CNS. The heart, while essential for circulation, is part of the cardiovascular system and not the nervous system. Similarly, while nerves and neurons play crucial roles in the peripheral nervous system, they aren't considered components of the CNS. Nerves are bundles of axons that transmit signals to and from the CNS, and neurons are the individual cells that process and transmit information. Thus, the correct answer highlights the specific structures that comprise the central nervous system itself.

5. What pH level indicates that a solution is alkaline?

- A. Below 7.0
- B. Exactly 7.0
- C. Higher than 7.0**
- D. None of the above

A solution is classified as alkaline, or basic, when its pH level is greater than 7.0. The pH scale ranges from 0 to 14, with 7.0 being neutral. Values below 7.0 indicate acidic solutions, while values above 7.0 denote alkaline solutions. Thus, any pH level higher than 7.0 signifies that the solution has a higher concentration of hydroxide ions compared to hydrogen ions, which is the defining characteristic of alkaline substances. This is why the option indicating a higher pH level than 7.0 is the correct answer.

6. Which part of the brain is responsible for regulating balance and coordination?

- A. Cerebrum
- B. Cerebellum**
- C. Brainstem
- D. Thalamus

The cerebellum is the part of the brain primarily responsible for regulating balance and coordination. It plays a crucial role in fine-tuning motor movements and ensuring that they are smooth and well-coordinated. This area of the brain receives input from the sensory systems as well as from the spinal cord and other parts of the brain, which allows it to maintain an accurate sense of position and movement. When a person moves, the cerebellum helps adjust the timing and force of those movements to maintain balance and posture, which is essential for activities such as walking, running, and playing sports. This is why damage or dysfunction in the cerebellum can lead to motor coordination issues, such as ataxia, where movements become erratic and unsteady. While other parts of the brain contribute to various aspects of movement, they do not primarily manage balance and coordination to the extent that the cerebellum does. For example, the cerebrum is responsible for higher cognitive functions and decision-making, the brainstem controls basic life functions such as heartbeat and breathing, and the thalamus acts as a relay station for sensory information but does not directly control balance and coordination.

7. What is the process of cytoplasm division during plant cell replication called?

- A. Mitosis
- B. Cytokinesis**
- C. Meiosis
- D. Photosynthesis

The process of cytoplasm division during plant cell replication is known as cytokinesis. This is the final step in cell division where the cytoplasm of a parental cell is divided into two daughter cells. In plant cells, cytokinesis is unique because it involves the formation of a cell plate, which eventually develops into the cell wall that separates the two new cells. Mitosis refers to the process of nuclear division where the chromosomes are duplicated and separated into two nuclei, but it does not encompass the division of the cytoplasm. Meiosis is a different type of cell division that occurs in the formation of gametes and involves two rounds of division, ultimately leading to genetic variation, rather than just the separation of cytoplasm. Photosynthesis is a process used by plants to convert light energy into chemical energy in the form of glucose, and it is unrelated to the process of cell division. Therefore, cytokinesis specifically describes the division of the cytoplasm that completes the process of cell replication in plant cells.

8. What type of sugar is glucose classified as?

- A. Complex Sugar
- B. Simple Sugar**
- C. Disaccharide
- D. Polysaccharide

Glucose is classified as a simple sugar. Simple sugars, also known as monosaccharides, are the most basic form of carbohydrates and consist of single sugar molecules. Glucose specifically is a monosaccharide and is a primary energy source for cells in the body. This classification is important in understanding how carbohydrates are metabolized and utilized. Monosaccharides like glucose are absorbed directly into the bloodstream during digestion, leading to quick energy availability. In contrast, complex sugars, disaccharides, and polysaccharides are made up of two or more monosaccharides and take longer to break down into simpler forms for absorption. Understanding these distinctions helps in grasping how different types of sugars affect energy levels and metabolism.

9. Which of the following is not a function of the kidneys?

- A. Regulating blood pressure
- B. Secreting enzymes**
- C. Removing waste products
- D. Regulating electrolyte balance

The kidneys have several critical functions in maintaining homeostasis within the body. One of their primary roles is the filtration of blood to remove waste products, which is accurately captured in the provided options. They also play a key role in regulating blood pressure through the renin-angiotensin-aldosterone system, which helps manage blood volume and systemic vascular resistance. Additionally, the kidneys maintain electrolyte balance by controlling the levels of essential minerals like sodium, potassium, and calcium in the blood. However, the kidneys do not secrete enzymes as part of their primary functions. While they do produce hormones such as erythropoietin, which stimulates red blood cell production, the secretion of enzymes is primarily associated with other organs, such as the pancreas, which releases digestive enzymes. Therefore, the response indicating that the secretion of enzymes is not a function of the kidneys is indeed correct, as this does not align with the well-established roles of the renal system.

10. What is the primary function of red blood cells?

- A. Transmitting nerve impulses
- B. Transporting oxygen**
- C. Producing hormones
- D. Fighting infections

The primary function of red blood cells is transporting oxygen. These cells, also known as erythrocytes, contain hemoglobin, a protein that binds to oxygen in the lungs and carries it throughout the body to tissues and organs. This process is crucial for cellular respiration, which is how cells produce the energy they need to function. Red blood cells also play a minor role in transporting carbon dioxide, a waste product from metabolism, back to the lungs for exhalation. While other options are functions carried out by different types of cells—such as nerve impulses being transmitted by neurons, hormones produced by glands, and infections fought off by white blood cells—these do not pertain to the function of red blood cells.

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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