

JLAB ACADEMIC PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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 a hypothesis?

- A. A definitive conclusion reached after completing research
- B. A proposed explanation for a phenomenon, which can be tested through experimentation
- C. An established scientific fact proven by multiple studies
- D. An opinion that varies from person to person

2. What does gene expression involve?

- A. The replication of DNA before cell division
- B. The production of energy from glucose in cells
- C. The process by which information encoded in a gene directs protein production
- D. The repair of damaged DNA sequences

3. How is DNA structured?

- A. A single strand of nucleotides
- B. A double helix made of nucleotides with sugar-phosphate backbones
- C. A series of linear proteins
- D. A series of linear RNA molecules

4. Which pair of words is an example of antonyms?

- A. Happy/Sad
- B. Eager/Enthusiastic
- C. Describe/Portray
- D. Above/Below

5. What term refers to the state transformation from gas back to liquid?

- A. Freezing
- B. Condensation
- C. Evaporation
- D. Melting

6. What is primarily found in the vacuoles of plant cells?

- A. Air
- B. Water and nutrients
- C. Waste products
- D. Genetic material

7. What occurs within the citric acid cycle?

- A. ATP is synthesized from glucose
- B. Acetyl-CoA is oxidized to carbon dioxide
- C. NADH is used to produce glucose
- D. Oxygen is consumed in the mitochondria

8. What type of cell is typically characterized by its simplicity and lack of organelles?

- A. Eukaryotic cell
- B. Prokaryotic cell
- C. Animal cell
- D. Plant cell

9. Which of the following describes the role of lysosomes?

- A. Store genetic information
- B. Break down foreign matter and dead cells
- C. Regulate cell growth
- D. Produce energy

10. What describes a gas?

- A. A substance with a definite shape
- B. A substance that has a definite volume and takes the shape of its container
- C. A substance with no definite shape and volume, with particles moving fast in all directions
- D. A substance that is easily compressed

Answers

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

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Explanations

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1. What is a hypothesis?

- A. A definitive conclusion reached after completing research
- B. A proposed explanation for a phenomenon, which can be tested through experimentation**
- C. An established scientific fact proven by multiple studies
- D. An opinion that varies from person to person

A hypothesis is a proposed explanation for a phenomenon that can be tested through experimentation. It serves as a starting point for scientific inquiry and is often formulated based on preliminary observations or existing knowledge. The essence of a hypothesis lies in its testability; it must be structured in such a way that it can be supported or refuted through empirical evidence gathered during systematic experiments. This process allows researchers to gather data, analyze outcomes, and refine their understanding of a particular scientific question. In contrast to the correct answer, a definitive conclusion reached after completing research represents a stage that comes after hypothesis testing, wherein a researcher summarizes their findings based on collected data. Established scientific facts are outcomes that have been widely accepted and repeatedly confirmed through rigorous studies, whereas a hypothesis remains in the realm of speculation until supported by empirical evidence. Lastly, while opinions may vary widely and can influence research perspectives, they do not hold the scientific rigor or testability that characterizes a hypothesis. Thus, option B is the only statement that accurately defines the role and nature of a hypothesis in the scientific method.

2. What does gene expression involve?

- A. The replication of DNA before cell division
- B. The production of energy from glucose in cells
- C. The process by which information encoded in a gene directs protein production**
- D. The repair of damaged DNA sequences

Gene expression is a fundamental biological process where the information encoded in a gene is utilized to direct the production of proteins. This process begins with transcription, where the DNA sequence of a gene is copied to produce messenger RNA (mRNA). Following transcription, the mRNA is translated into a specific protein at the ribosomes, using the genetic information to determine the sequence of amino acids. This is crucial because proteins perform a vast array of functions in living organisms, including acting as enzymes, structural components, and signaling molecules, among others. Understanding gene expression is essential because it illustrates how genes dictate cellular functions and traits. Each gene can be expressed at different levels, depending on various factors such as the type of cell, developmental stage, and environmental signals, which further emphasizes the importance of this process in regulating biological activities.

3. How is DNA structured?

- A. A single strand of nucleotides
- B. A double helix made of nucleotides with sugar-phosphate backbones**
- C. A series of linear proteins
- D. A series of linear RNA molecules

DNA is characterized by its double helix structure, which consists of two strands of nucleotides that twist around each other. Each nucleotide in DNA is made up of a sugar molecule, a phosphate group, and a nitrogenous base. The sugar-phosphate backbone provides structural support, while the nitrogenous bases pair specifically (adenine with thymine and cytosine with guanine) through hydrogen bonds, forming the rungs of the helix. The double helix design is essential because it allows DNA to be compactly stored within the cell nucleus while also providing a reliable mechanism for replication. The complementary nature of the base pairing ensures that genetic information can be accurately copied during cell division, which is crucial for the continuation of life. In contrast, single strands of nucleotides do not represent the stable structure of DNA and lack the complementary pairing that is vital for maintaining genetic information. Linear proteins and RNA molecules, while essential in biological processes, do not describe the DNA structure itself. Therefore, the description of DNA as a double helix with sugar-phosphate backbones accurately captures its composition and structural configuration.

4. Which pair of words is an example of antonyms?

- A. Happy/Sad**
- B. Eager/Enthusiastic
- C. Describe/Portray
- D. Above/Below

The pair of words "Happy/Sad" represents antonyms because they convey opposite emotions. "Happy" indicates a state of joy or contentment, while "Sad" reflects a state of sorrow or unhappiness. This direct contrast in meaning between the two words clearly identifies them as antonyms. In the other pairs, the words either do not convey opposing meanings or are closely related in context. For instance, "Eager" and "Enthusiastic" both express a positive outlook and a desire for engagement, rather than representing opposites. "Describe" and "Portray" are synonyms that express similar ideas about depicting or representing something, lacking any contrast in meaning. Lastly, "Above" and "Below" are also antonyms, but the focus here is specifically on the emotional context provided by "Happy/Sad."

5. What term refers to the state transformation from gas back to liquid?

- A. Freezing
- B. Condensation**
- C. Evaporation
- D. Melting

The term that refers to the state transformation from gas back to liquid is condensation. This process occurs when a gas cools down and the particles lose energy, resulting in a change of state as they come together to form a liquid. An everyday example of condensation can be found when water vapor in the air turns into droplets on a cold surface, such as a glass of ice water. In contrast, freezing is the transformation from liquid to solid, evaporation refers to the change from liquid to gas, and melting is the process of changing from solid to liquid. Understanding these terms in the context of phase changes helps clarify their distinct roles in the states of matter.

6. What is primarily found in the vacuoles of plant cells?

- A. Air
- B. Water and nutrients**
- C. Waste products
- D. Genetic material

Vacuoles in plant cells are primarily responsible for storing water and various nutrients, which is essential for maintaining turgor pressure and supporting the overall structure of the plant. When vacuoles are filled with water, they create internal pressure against the cell wall, helping to keep the plant firm and upright. In addition to water, vacuoles can also hold a variety of nutrients, such as sugars, amino acids, and ions, which are vital for the plant's metabolic processes. These stored nutrients can be utilized by the plant when needed, making vacuoles an important component for the health and growth of the plant. While vacuoles can contain some waste products or contribute to waste storage, their primary and most significant role is centered around water and nutrient storage. This is why the focus on water and nutrients in vacuoles provides a better understanding of their function within the plant cell.

7. What occurs within the citric acid cycle?

- A. ATP is synthesized from glucose
- B. Acetyl-CoA is oxidized to carbon dioxide**
- C. NADH is used to produce glucose
- D. Oxygen is consumed in the mitochondria

Within the citric acid cycle, acetyl-CoA is indeed oxidized to carbon dioxide. This process occurs in the mitochondria and is a crucial part of cellular respiration. The cycle starts when acetyl-CoA, derived from carbohydrates, fats, and proteins, enters the citric acid cycle and combines with a four-carbon molecule to form citrate. As citrate goes through a series of transformations, it is decarboxylated, leading to the release of carbon dioxide. During this cycle, high-energy electron carriers like NADH and FADH₂ are produced, which play a vital role in the electron transport chain where ATP is synthesized. However, ATP is not directly produced within the citric acid cycle itself. This distinguishes it from the other options, as the cycle primarily focuses on the oxidation of acetyl-CoA rather than synthesizing glucose or consuming oxygen directly in the cycle. Oxygen is indirectly involved through the electron transport chain, but it's not consumed in the reactions of the citric acid cycle itself.

8. What type of cell is typically characterized by its simplicity and lack of organelles?

- A. Eukaryotic cell
- B. Prokaryotic cell**
- C. Animal cell
- D. Plant cell

The correct answer is that a prokaryotic cell is typically characterized by its simplicity and lack of organelles. Prokaryotic cells are the most basic form of cellular life, and they do not have the complex structures found in eukaryotic cells. Specifically, prokaryotic cells lack membrane-bound organelles such as a nucleus, mitochondria, and endoplasmic reticulum. Instead, their genetic material is located in a region called the nucleoid, which is not enclosed by a membrane. This lack of compartmentalization contributes to the simplicity of prokaryotic cells, allowing them to reproduce quickly and adapt to various environments. In contrast, eukaryotic cells, which include animal and plant cells, have a more complex structure with various organelles that perform specific functions, aiding in processes such as energy production and protein synthesis. Thus, the defining characteristic of prokaryotic cells is their simplicity compared to eukaryotic cells, making them a distinct type of cell in biological classification.

9. Which of the following describes the role of lysosomes?

- A. Store genetic information
- B. Break down foreign matter and dead cells**
- C. Regulate cell growth
- D. Produce energy

Lysosomes are membrane-bound organelles that play a crucial role in the cellular waste disposal system. Their primary function is to break down foreign matter, such as bacteria and viruses, as well as dead or damaged cells. This process occurs through the action of enzymes contained within the lysosomes, which are capable of degrading various biomolecules, including proteins, lipids, and carbohydrates. By fulfilling this role, lysosomes help maintain cellular health by recycling cellular components and managing waste products. This process is essential for the overall functioning of the cell and helps prevent the accumulation of harmful substances that could lead to cellular stress or disease. In contrast, the other options represent functions that are not associated with lysosomes. For instance, storing genetic information is handled by the nucleus, regulating cell growth involves a variety of signaling pathways and molecules, and energy production is primarily carried out by mitochondria. These distinctions clarify why lysosomes are uniquely suited to their specific function of degradation and waste management in the cell.

10. What describes a gas?

- A. A substance with a definite shape
- B. A substance that has a definite volume and takes the shape of its container
- C. A substance with no definite shape and volume, with particles moving fast in all directions**
- D. A substance that is easily compressed

A gas is characterized by its lack of definite shape and volume. This means that gases will expand to fill the container they are placed in, taking the shape of that container without being constrained by fixed boundaries. The particles in a gas are in constant, rapid motion, moving freely and independently of one another. This fast movement contributes to their ability to spread out and fill any available space. In addition to these properties, gases are also compressible, which is an important characteristic. However, the defining features of a gas are fundamentally its lack of shape and volume, alongside the rapid motion of its particles. This clear understanding of the nature of gases is foundational in differentiating them from solids and liquids, which have definable shapes and volumes.

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://jlabacademic.examzify.com>

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

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