The Chemistry of Biology Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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. Which molecule stores genetic information in cells?

A. RNA

B. Deoxyribonucleic acid

C. Adenosine triphosphate

D. Protein

2. Which term best fits the definition: in chemical reactions, the loss of electrons by one reactant?

A. Reduction

B. Redox

C. Oxidizing agent

D. Oxidation

3. Which term best fits the definition: a negatively charged ion?

A. Anion

B. Cation

C. Ion

D. Molecule

4. What is the sugar in RNA?

A. Fructose

B. Ribose

C. Glucose

D. Deoxyribose

5. Which bases are pyrimidines? (Another variant)

A. Adenine and Guanine

B. Uracil, thymine, cytosine

C. Cytosine and Guanine

D. Uracil and cytosine

6. Which quantity is defined as the number of protons in an atom?

A. Mass Number

B. Atomic Number

C. Number of Protons

D. Charge

7. A molecule composed mainly of carbon, hydrogen, and oxygen in about a 1:2:1 ratio is most characteristic of which class of biomolecules?

A. Carbohydrate

B. Protein

C. Lipid

D. Nucleic acid

8. Which class of lipids forms a major structural component of cell membranes, characterized by a phosphate head and fatty acid tails?

A. Phospholipid

B. Triglyceride

C. Glycolipid

D. Sterol

9. Which measurement reflects the total number of protons and neutrons in an atom?

A. Atomic Number

B. Element

C. Isotope

D. Mass Number

10. Which term describes substances that dissolve in water?

A. Solute

B. Solvent

C. Solution

D. Suspension

Answers

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

Explanations

1. Which molecule stores genetic information in cells?

A. RNA

B. Deoxyribonucleic acid

C. Adenosine triphosphate

D. Protein

Genetic information is stored in a molecule that can be accurately copied and kept stable over time. DNA fits this role because its structure provides a durable, long-term repository for the instructions that specify how an organism builds and maintains itself. The double-helix design with complementary base pairing means each strand can serve as a precise template for creating the other, enabling faithful replication during cell division. The sequence of bases encodes genes and regulatory elements, and the chemistry of DNA is well-suited to resisting degradation long enough to pass information to offspring. RNA, while essential for reading and transmitting genetic information (and for many cellular tasks), is generally less stable and is used for temporary messages and catalytic roles rather than long-term storage. ATP stores energy, not hereditary information. Proteins perform a wide range of cellular functions, but they do not serve as heritable information stores.

2. Which term best fits the definition: in chemical reactions, the loss of electrons by one reactant?

A. Reduction

B. Redox

C. Oxidizing agent

D. Oxidation

The key idea is that oxidation is the process of losing electrons. When a reactant loses electrons, its oxidation state increases, so that substance is oxidized. In a redox reaction, this loss of electrons by one partner is paired with another partner gaining those electrons (reduction). The term redox describes the overall coupled process, not the act of losing electrons by itself. An oxidizing agent is the species that accepts electrons and is reduced, enabling the other reactant to be oxidized. Reduction, by contrast, is the gain of electrons, the opposite process. So the term that best fits the given definition is oxidation.

3. Which term best fits the definition: a negatively charged ion?

A. Anion

B. Cation

C. Ion

D. Molecule

A negatively charged ion is called an anion. An ion is any atom or group that has a net electric charge. When an atom gains electrons, it becomes more electrons than protons, giving it a negative charge, which is what defines an anion. A cation, in contrast, is positively charged because it has lost electrons. A molecule usually refers to a neutral group of atoms bonded together, though some charged species exist, the specific term for a negatively charged entity is an anion.

4. What is the sugar in RNA?

A. Fructose

B. Ribose

C. Glucose

D. Deoxyribose

RNA uses ribose as its sugar. Ribose is a five-carbon sugar that forms the backbone of RNA nucleotides, carrying a hydroxyl group on the 2' carbon. That 2' hydroxyl is a key difference from deoxyribose, which lacks it and is found in DNA, contributing to greater stability of DNA. Fructose and glucose are hexose sugars used in metabolism, not as the backbone sugar of RNA. So the sugar in RNA is ribose.

5. Which bases are pyrimidines? (Another variant)

A. Adenine and Guanine

B. Uracil, thymine, cytosine

C. Cytosine and Guanine

D. Uracil and cytosine

Pyrimidines are one-ring nitrogenous bases. In nucleic acids, purines (adenine and guanine) have two rings, while pyrimidines have one ring and include cytosine, thymine (in DNA), and uracil (in RNA). The best choice lists uracil, thymine, and cytosine, which covers all pyrimidines across both DNA and RNA. Adenine and guanine are purines, so they don't belong in this set. An option with two pyrimidines but missing thymine or an option with adenine and guanine would not fully represent the pyrimidine group.

6. Which quantity is defined as the number of protons in an atom?

A. Mass Number

B. Atomic Number

C. Number of Protons

D. Charge

The atomic number is the number of protons in an atom. This quantity uniquely identifies the element because each element has a characteristic count of protons, and all atoms of that element share it. The mass number, in contrast, is the sum of protons and neutrons, so it varies among isotopes of the same element. Saying "number of protons" describes the same count, but the standard term used is atomic number. Charge expresses the net electric charge, which depends on the balance of protons and electrons; a neutral atom has zero charge, while ions carry positive or negative charge.

7. A molecule composed mainly of carbon, hydrogen, and oxygen in about a 1:2:1 ratio is most characteristic of which class of biomolecules?

A. Carbohydrate

B. Protein

C. Lipid

D. Nucleic acid

Carbohydrates are built with carbon, hydrogen, and oxygen in about a 1:2:1 ratio, reflecting the common empirical formula CH_2O and the general composition $C_n(H_2O)_n$. This hydrated pattern is seen in simple sugars like glucose ($C_6H_{12}O_6$) and underpins the idea that carbohydrates store and provide quick energy as well as serve as structural components. Lipids differ because they are rich in carbon and hydrogen with relatively little oxygen and do not follow the CH_2O ratio. Proteins and nucleic acids include other elements (like nitrogen and phosphorus) and do not fit this simple 1:2:1 proportion. Therefore, the described molecule best characterizes carbohydrates.

8. Which class of lipids forms a major structural component of cell membranes, characterized by a phosphate head and fatty acid tails?

A. Phospholipid

B. Triglyceride

C. Glycolipid

D. Sterol

Membranes rely on amphipathic molecules that have a hydrophilic phosphate-containing head and hydrophobic fatty acid tails. In water, they naturally arrange into a bilayer with the heads facing outward toward the aqueous surroundings and the tails tucked inside, forming a flexible, selectively permeable barrier. This structural bilayer is the main building block of cell membranes, and the phosphate head provides polarity for interactions with the environment and proteins, while the fatty acid tails create the nonpolar interior that prevents most polar substances from crossing freely. Other lipids serve different roles. Triglycerides are primarily energy storage molecules and aren't part of the membrane structure. Glycolipids have sugar-containing heads rather than phosphate groups, contributing to signaling and cell recognition but not forming the core bilayer. Sterols, like cholesterol, help modulate membrane fluidity and stability but aren't the main structural component of the membrane.

9. Which measurement reflects the total number of protons and neutrons in an atom?

A. Atomic Number

B. Element

C. Isotope

D. Mass Number

The total number of protons and neutrons in a nucleus is captured by the mass number. This value, often denoted A, counts all nucleons in the nucleus, so it equals the number of protons (the atomic number, Z) plus the number of neutrons (N): A = Z + N. That's why isotopes of the same element have different mass numbers—they share the same number of protons but have different numbers of neutrons. The atomic number describes protons alone and identifies the element, while the term isotope refers to variants with different neutron counts. Atomic mass, on the other hand, is a weighted average of all isotopes and isn't just a simple integer count of nucleons.

10. Which term describes substances that dissolve in water?

A. Solute

B. Solvent

C. Solution

D. Suspension

In a solution, the substance that dissolves is called the solute. Water acts as the solvent, so substances that dissolve in water are solutes. For example, when you dissolve table salt or sugar in water, the salt or sugar is the solute and the water is the solvent, and together they form a solution. A suspension is a different kind of mixture where particles don't fully dissolve and may settle out. So the term that describes substances that dissolve in water is solute.

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://cemistryofbiology.examzify.com

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