

Arizona State University (ASU) BIO181 General Biology I Exam 1 Practice (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

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- 1. What functions do lipids serve in living organisms?**
 - A. They are primarily used for energy storage and structural components**
 - B. They are essential for energy release during respiration**
 - C. They serve primarily as carriers for genetic information**
 - D. They function as immediate energy sources in cells**

- 2. What are the two stages of photosynthesis called?**
 - A. Light-dependent and dark reactions**
 - B. Light-dependent reactions and Calvin cycle**
 - C. Calvin cycle and glycolysis**
 - D. Electron transport chain and Krebs cycle**

- 3. Which of the following best defines a phenotype?**
 - A. The genetic makeup of an organism**
 - B. The observable traits of an organism**
 - C. The mutations present in the DNA**
 - D. The environmental influences on genetics**

- 4. How do autotrophs differ from heterotrophs?**
 - A. Autotrophs rely on inorganic matter**
 - B. Autotrophs consume other organisms for energy**
 - C. Autotrophs produce their own food**
 - D. Autotrophs are exclusively herbivores**

- 5. What is the primary function of RNA in cells?**
 - A. Storing genetic information**
 - B. Providing structure to the cell**
 - C. Template for protein synthesis**
 - D. Transporting oxygen in the blood**

- 6. What is a chromosome?**
 - A. A structure composed of RNA and protein**
 - B. A structure composed of DNA and protein that contains genetic information**
 - C. A structure that synthesizes proteins**
 - D. A small organelle that breaks down fatty acids**

7. What are the two major types of cell division?

- A. Mitosis and binary fission**
- B. Mitosis and meiosis**
- C. Meiosis and budding**
- D. Mitosis and fragmentation**

8. What is the primary function of lysosomes?

- A. Energy production**
- B. Protein synthesis**
- C. Aiding in cell division**
- D. Breaking down waste materials**

9. For a protein to enter the endoplasmic reticulum, what initial step must occur?

- A. A ribosome must bind to the DNA**
- B. A ribosome binds to the mRNA and synthesizes a signal sequence**
- C. A protein must be folded properly in the cytoplasm**
- D. A signal peptide needs to be removed first**

10. What role does transfer RNA (tRNA) primarily serve?

- A. Transporting information in the cell**
- B. Catalyzing biochemical reactions**
- C. Bringing amino acids to the ribosome**
- D. Storing genetic information**

Answers

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

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Explanations

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1. What functions do lipids serve in living organisms?

A. They are primarily used for energy storage and structural components

B. They are essential for energy release during respiration

C. They serve primarily as carriers for genetic information

D. They function as immediate energy sources in cells

Lipids serve several crucial functions within living organisms, and one of their primary roles is energy storage. They are energy-dense molecules, providing more than twice the amount of energy per gram compared to carbohydrates or proteins. This characteristic allows organisms to store energy efficiently, which can be mobilized when needed. Additionally, lipids play a significant role in forming structural components of cells. Phospholipids, a type of lipid, are fundamental in constructing cellular membranes, providing both structure and a barrier that regulates the movement of substances in and out of cells. This structural role is vital for maintaining the integrity and functionality of cells. While lipids can be involved in energy release during respiration, they are not the primary source of immediate energy; that role is typically filled by carbohydrates. The assertion that lipids primarily act as carriers for genetic information does not accurately represent their biological function, as this is the role of nucleic acids. Lastly, lipids are not used as immediate energy sources in the same way that carbohydrates are, which are readily accessed for quick energy needs. Thus, the correct answer underscores the dual role of lipids in energy storage and their structural contributions to cellular components.

2. What are the two stages of photosynthesis called?

A. Light-dependent and dark reactions

B. Light-dependent reactions and Calvin cycle

C. Calvin cycle and glycolysis

D. Electron transport chain and Krebs cycle

The two stages of photosynthesis are indeed referred to as light-dependent reactions and the Calvin cycle. In the light-dependent reactions, which take place in the thylakoid membranes of the chloroplasts, light energy is captured and converted into chemical energy in the form of ATP and NADPH. This stage requires sunlight to drive the process, extracting electrons from water and releasing oxygen as a byproduct. The Calvin cycle, on the other hand, occurs in the stroma of the chloroplasts and does not directly require light. Instead, it uses the ATP and NADPH produced in the light-dependent reactions to convert carbon dioxide and ribulose bisphosphate (RuBP) into glucose and other carbohydrates through a series of enzymatic reactions. The other options, while containing terms that relate to cellular processes, are not accurate in describing the two main stages of photosynthesis. Glycolysis pertains to cellular respiration, and the Krebs cycle is also a part of cellular respiration, distinct from the processes involved in photosynthesis.

3. Which of the following best defines a phenotype?

- A. A. The genetic makeup of an organism
- B. B. The observable traits of an organism**
- C. C. The mutations present in the DNA
- D. D. The environmental influences on genetics

A phenotype refers to the observable characteristics or traits of an organism, which are the result of the interaction between its genetic makeup and the environment. This definition encompasses various attributes such as physical appearance, behavior, and physiological properties that can be seen or measured. For instance, a plant's height, flower color, and leaf shape are all part of its phenotype. Understanding this concept is crucial because it highlights how genetic information (genotype) translates into visible traits and how these traits can be influenced by external factors. Therefore, the answer accurately captures the essence of what a phenotype represents in biological terms.

4. How do autotrophs differ from heterotrophs?

- A. Autotrophs rely on inorganic matter
- B. Autotrophs consume other organisms for energy
- C. Autotrophs produce their own food**
- D. Autotrophs are exclusively herbivores

Autotrophs are organisms that have the ability to produce their own food, primarily through processes like photosynthesis or chemosynthesis. This means that they can convert inorganic substances—such as carbon dioxide and water—into organic compounds like glucose using energy from sunlight or chemical reactions. This intrinsic ability to make their own food distinguishes them from heterotrophs, which cannot synthesize their own organic substances and must obtain their energy by consuming other organisms, whether plant or animal. In contrast to autotrophs, heterotrophs rely on external sources of organic material for nutrition. This fundamental difference highlights the ecological roles these groups play, with autotrophs serving as primary producers in ecosystems, forming the base of the food web, while heterotrophs occupy various consumer levels. The assertion that autotrophs rely on inorganic matter is partially true but does not encompass the full distinction between the two groups. The statement that autotrophs consume other organisms for energy is inaccurate, as it contradicts the very definition of autotrophy. Lastly, stating that autotrophs are exclusively herbivores is misleading, as autotrophs can include organisms like certain bacteria and algae that do not fit into the herbivore category. Thus, the correct understanding of autotrophy is crucial for accurate biological classification.

5. What is the primary function of RNA in cells?

- A. Storing genetic information**
- B. Providing structure to the cell**
- C. Template for protein synthesis**
- D. Transporting oxygen in the blood**

RNA plays a crucial role in the process of protein synthesis, serving as a template for translating genetic information into proteins. This is primarily accomplished through two main processes: transcription and translation. During transcription, messenger RNA (mRNA) is synthesized from a DNA template, carrying the genetic instructions out of the nucleus to the ribosomes. Once at the ribosomes, transfer RNA (tRNA) and ribosomal RNA (rRNA) are involved in translating the sequence of the mRNA into a polypeptide chain, which eventually folds into a functional protein. This function of RNA as a template for protein synthesis highlights its importance in the central dogma of molecular biology, which outlines the flow of genetic information within a biological system. Other options do not align with RNA's primary role; for example, while DNA is responsible for storing genetic information, RNA acts in a more dynamic capacity during the expression of that information. Similarly, providing structure to the cell is mainly a function of proteins and complex biological structures, while the transportation of oxygen in the blood is primarily performed by hemoglobin found in red blood cells. Thus, the correct answer identifies RNA's key function as a critical intermediary in the synthesis of proteins essential for cell and organismal function.

6. What is a chromosome?

- A. A structure composed of RNA and protein**
- B. A structure composed of DNA and protein that contains genetic information**
- C. A structure that synthesizes proteins**
- D. A small organelle that breaks down fatty acids**

A chromosome is correctly defined as a structure composed of DNA and protein that contains genetic information. This definition accurately captures the fundamental role of chromosomes in genetics, as they serve as the carriers of genetic material in living organisms. Each chromosome consists of a long DNA molecule that is tightly coiled around proteins known as histones. This organization is crucial for DNA packaging within the cell nucleus and also for the proper distribution of genetic material during cell division. The presence of both DNA and protein within a chromosome is essential for several processes. The DNA holds the genes, which determine inherited characteristics, while the associated proteins play key roles in maintaining the structure of the chromosome, regulating gene expression, and ensuring the correct segregation of chromosomes during cell division. While the other options mention structures related to cellular function, they do not accurately describe a chromosome. The focus on the combination of DNA and protein in option B is what makes it the correct answer, highlighting the chromosomal role in storing and transmitting genetic information.

7. What are the two major types of cell division?

- A. Mitosis and binary fission
- B. Mitosis and meiosis**
- C. Meiosis and budding
- D. Mitosis and fragmentation

The two major types of cell division are mitosis and meiosis. Mitosis is the process by which a single cell divides to produce two genetically identical daughter cells, and it is crucial for growth, repair, and asexual reproduction in multicellular organisms. During mitosis, the cell's genetic material is replicated and evenly distributed to ensure that each daughter cell receives the same genetic information. Meiosis, on the other hand, is a specialized form of cell division that occurs only in the production of gametes (sperm and eggs) in sexually reproducing organisms. This process reduces the chromosome number by half, resulting in four non-identical daughter cells, each with half the genetic material of the original cell. This reduction is essential for maintaining the correct chromosome number across generations during sexual reproduction. In contrast, options that mention binary fission, budding, or fragmentation refer to various methods of asexual reproduction and cellular division that do not encompass the fundamental types of cell division described by scientific consensus. Binary fission is primarily associated with prokaryotes, while budding and fragmentation are specific processes in certain organisms but are not recognized as major types of cell division like mitosis and meiosis are.

8. What is the primary function of lysosomes?

- A. Energy production
- B. Protein synthesis
- C. Aiding in cell division
- D. Breaking down waste materials**

Lysosomes play a critical role in cellular maintenance and homeostasis by breaking down waste materials and cellular debris. They contain a variety of hydrolytic enzymes that are capable of digesting macromolecules such as proteins, lipids, carbohydrates, and nucleic acids. This process is essential for recycling cellular components, a process known as autophagy, and for ingesting and degrading foreign material like pathogens. By breaking down these materials, lysosomes prevent the accumulation of waste within the cell and facilitate the recycling of cellular components, which can be repurposed for new cellular structures or energy. This function is crucial for the overall health of the cell and contributes to the overall functioning of the organism.

9. For a protein to enter the endoplasmic reticulum, what initial step must occur?

- A. A ribosome must bind to the DNA**
- B. A ribosome binds to the mRNA and synthesizes a signal sequence**
- C. A protein must be folded properly in the cytoplasm**
- D. A signal peptide needs to be removed first**

For a protein to enter the endoplasmic reticulum (ER), the initial step involves the binding of a ribosome to messenger RNA (mRNA), which then synthesizes a signal sequence. This signal sequence is crucial as it acts as a molecular address that directs the nascent polypeptide to the ER. Once the signal peptide has been synthesized at the beginning of the polypeptide chain, it guides the ribosome to the ER membrane where it interacts with a protein translocation complex. This process is essential for the proper localization of proteins that are destined for secretion, incorporation into the plasma membrane, or residency within the endomembrane system. The synthesis of the signal sequence occurs during translation, and it is this sequence that ultimately dictates the pathway for the growing polypeptide chain to be translocated into the ER. In this context, it's important to recognize that solely binding of a ribosome to DNA or folding of a protein prior to its entry into the ER does not occur. The removal of a signal peptide typically happens later in the process, after the protein has successfully entered the ER, thus reinforcing the importance of the signal sequence synthesis as the critical first step.

10. What role does transfer RNA (tRNA) primarily serve?

- A. Transporting information in the cell**
- B. Catalyzing biochemical reactions**
- C. Bringing amino acids to the ribosome**
- D. Storing genetic information**

Transfer RNA (tRNA) primarily serves the crucial function of bringing amino acids to the ribosome during the process of protein synthesis, also known as translation. Each tRNA molecule is specific to one amino acid and has a corresponding anticodon that pairs with the codon on the mRNA strand. This matching allows the tRNA to deliver the appropriate amino acid in the correct sequence, which is essential for forming proteins according to the genetic code. This process is fundamental to the overall functioning of cells, as proteins are vital for a wide range of biological activities, including structural support, catalyzing reactions, and regulating processes within the cell. By facilitating the correct assembly of amino acids, tRNA plays an indispensable role in ensuring that proteins are synthesized accurately and efficiently.

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://asu-bio181exam1.examzify.com>

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

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