

ARIZONA STATE UNIVERSITY (ASU) BIO181 GENERAL BIOLOGY I EXAM 2 PRACTICE (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. Which combination of items is necessary for photosynthesis to take place?**
 - A. Oxygen, Glucose, and Light
 - B. Nitrogen, Water, and Carbon Dioxide
 - C. Water, Carbon Dioxide, and Sunlight
 - D. Chlorophyll, Glucose, and Nitrogen
- 2. How do mutations contribute to evolution?**
 - A. They are always harmful
 - B. They reduce genetic variation
 - C. They introduce genetic variation within a population
 - D. They eliminate non-advantageous traits
- 3. In what way is the making of a primary lysosome similar to the enzymes delivered by the pancreas?**
 - A. Both are made by membrane bound polyribosomes
 - B. Both are activated by pH changes in the stomach
 - C. Both contain ribosomal RNA
 - D. Both are stored in vesicles until needed
- 4. What type of polyribosome is involved in eukaryotic protein synthesis?**
 - A. Free only
 - B. Membrane-bound only
 - C. Both Free and Membrane-bound
 - D. Neither Free nor Membrane-bound
- 5. What is the function of enzymes within biological systems?**
 - A. They serve as a structural component of cells
 - B. They act as catalysts to speed up chemical reactions
 - C. They provide energy for cellular activities
 - D. They facilitate the movement of substances across membranes
- 6. Are red blood cells considered part of the immune system?**
 - A. Yes
 - B. No
 - C. Only When Infected
 - D. Only in Specific Conditions

- 7. What does it indicate when a bacterium is coated by antibodies?**
- A. It can survive and multiply
 - B. It should be endocytosed by a macrophage
 - C. It is not recognized by the immune system
 - D. It has been neutralized
- 8. What type of junction provides a stronger adhesion in epithelial tissue?**
- A. Tight junctions
 - B. Desmosomes
 - C. Adhering junctions
 - D. Hemidesmosomes
- 9. What process describes the movement of water across a semipermeable membrane?**
- A. Diffusion
 - B. Osmosis
 - C. Filtration
 - D. Active transport
- 10. What are the end products of the light reactions in photosynthesis?**
- A. Glucose and Oxygen
 - B. ATP, NADPH + H⁺, and Oxygen
 - C. Carbon Dioxide and Water
 - D. ATP and NADH

Answers

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

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Explanations

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1. Which combination of items is necessary for photosynthesis to take place?

- A. Oxygen, Glucose, and Light
- B. Nitrogen, Water, and Carbon Dioxide
- C. Water, Carbon Dioxide, and Sunlight**
- D. Chlorophyll, Glucose, and Nitrogen

Photosynthesis is a biochemical process through which plants, algae, and some bacteria convert light energy into chemical energy, resulting in glucose production. The fundamental equation for photosynthesis highlights the requirement for water, carbon dioxide, and sunlight. Water serves as an electron donor, providing the protons and electrons necessary to power the light reactions of photosynthesis. Carbon dioxide is utilized in the Calvin cycle to produce glucose, which is the end product of the process and serves as an energy source for the plant. Sunlight is the energy source that drives the reactions, allowing plants to convert the absorbed light into chemical energy. This combination is essential for the photosynthetic pathway to operate effectively, making it the correct answer. Other combinations listed do not include all the necessary components required for this vital process. For instance, oxygen is a byproduct of photosynthesis, not a necessary component, and glucose, while produced during the process, is not required for photosynthesis to occur.

2. How do mutations contribute to evolution?

- A. They are always harmful
- B. They reduce genetic variation
- C. They introduce genetic variation within a population**
- D. They eliminate non-advantageous traits

Mutations are fundamental to the process of evolution because they introduce genetic variation within a population. Genetic variation is essential for natural selection to occur, as it provides the raw material upon which evolutionary forces can act. By creating new alleles or changes in the genetic code, mutations can result in new traits that may be beneficial, neutral, or even harmful. When a mutation leads to a trait that enhances an organism's fitness in its environment, that trait can become more common in the population over generations through the mechanism of natural selection. Conversely, if a mutation is disadvantageous, it may be reduced or eliminated over time. This process of mutation and selection helps populations adapt to their environments, ultimately driving the evolutionary process. In contrast, the other choices do not accurately describe the role of mutations in evolution. For example, mutations are not always harmful; many are neutral or beneficial. Furthermore, mutations contribute to, rather than reduce, genetic variation within populations. Lastly, while some mutations may lead to the elimination of non-advantageous traits, this is not their primary contribution to evolution, which is the introduction of variation that can be acted upon by selection.

3. In what way is the making of a primary lysosome similar to the enzymes delivered by the pancreas?

- A. Both are made by membrane bound polyribosomes**
- B. Both are activated by pH changes in the stomach
- C. Both contain ribosomal RNA
- D. Both are stored in vesicles until needed

The production of a primary lysosome shares similarities with the enzymes delivered by the pancreas in that both are synthesized by membrane-bound polyribosomes. In eukaryotic cells, membrane-bound polyribosomes are responsible for translating mRNA that codes for proteins destined for secretion or for insertion into membranes, such as the enzymes produced by the pancreas, which are important for digestion. Similarly, the enzymes within primary lysosomes are synthesized in this manner, as lysosomal enzymes are produced in the rough endoplasmic reticulum, where they are initially synthesized as precursors before being packaged into vesicles and transported to the lysosome. This commonality in their production highlights a critical aspect of cellular function in utilizing ribosomes attached to membranes to direct the synthesis of proteins that play vital roles in cell metabolism and digestion. The other options do not reflect the same process: for example, the enzymes from the pancreas are not activated by pH changes in the stomach prior to being made; rather, they are secreted in an inactive form and then activated in the intestine, making that option inaccurate. Similarly, both lysosomal enzymes and pancreatic enzymes are not activated or stored in the same manner, nor do they have the same components when considered at the molecular level,

4. What type of polyribosome is involved in eukaryotic protein synthesis?

- A. Free only
- B. Membrane-bound only
- C. Both Free and Membrane-bound**
- D. Neither Free nor Membrane-bound

In eukaryotic cells, polyribosomes, or polysomes, can be found in both free and membrane-bound forms, reflecting the diversity and versatility of protein synthesis in these organisms. Free ribosomes are found floating in the cytoplasm and primarily synthesize proteins that function within the cytosol, such as enzymes and structural proteins. On the other hand, membrane-bound ribosomes are attached to the endoplasmic reticulum (ER), specifically the rough ER, and are responsible for producing proteins that are either secreted from the cell or incorporated into cellular membranes. The presence of both types of polyribosomes allows eukaryotic cells to efficiently synthesize a wide array of proteins tailored to their specific functional needs. For instance, proteins destined for secretion or for use in the cell membrane are synthesized by the ribosomes on the ER, while those needed for use within the cell itself can be synthesized by free ribosomes. This dual system enhances the adaptability and functionality of eukaryotic cells. Therefore, the correct answer accurately reflects the complex processes at play in eukaryotic protein synthesis.

5. What is the function of enzymes within biological systems?

- A. They serve as a structural component of cells
- B. They act as catalysts to speed up chemical reactions**
- C. They provide energy for cellular activities
- D. They facilitate the movement of substances across membranes

Enzymes play a crucial role in biological systems by acting as catalysts to accelerate chemical reactions. This catalytic function is vital because many biochemical reactions occur at a rate that would be far too slow without the presence of enzymes. Enzymes lower the activation energy required for reactions, thus increasing the rate at which substrates are converted into products. This process allows cells to carry out essential metabolic functions efficiently and effectively under physiological conditions. In addition, enzymes are highly specific, meaning each type of enzyme typically catalyzes only one particular reaction or a set of closely related reactions. This specificity ensures that the metabolic pathways in cells are tightly regulated and occur in a coordinated manner, allowing for precise control over cellular activities. Thus, the primary function of enzymes as catalysts is central to maintaining life processes within living organisms.

6. Are red blood cells considered part of the immune system?

- A. Yes
- B. No**
- C. Only When Infected
- D. Only in Specific Conditions

Red blood cells, also known as erythrocytes, primarily function to transport oxygen from the lungs to the body's tissues and carry carbon dioxide back to the lungs for exhalation. They do not play a direct role in the immune response, which is primarily facilitated by white blood cells, lymphocytes, macrophages, and other components of the immune system. While red blood cells can have some indirect interactions with the immune system (for example, by influencing the environment in which immune cells operate), they lack the specific functions associated with immune cells, such as identifying, attacking, or remembering pathogens. This distinction is crucial for understanding the roles of different cell types in the body and emphasizes the specialized nature of immune response mechanisms. Therefore, categorizing red blood cells as part of the immune system is not accurate.

7. What does it indicate when a bacterium is coated by antibodies?

- A. It can survive and multiply
- B. It should be endocytosed by a macrophage**
- C. It is not recognized by the immune system
- D. It has been neutralized

When a bacterium is coated by antibodies, this signifies that the antibodies are marking the bacterium for destruction by immune cells. The coating of antibodies, also known as opsonization, enhances the ability of phagocytic cells, such as macrophages, to identify and engulf the bacterium. This process is crucial for eliminating pathogens from the body. The presence of antibodies on the bacterium indicates that the immune system recognizes it as a potential threat. Macrophages can bind to the antibodies via their Fc receptors and subsequently endocytose the bacterium, leading to its degradation and clearance. Therefore, such a coating does not mean the bacterium is viable or escaping immune detection; instead, it highlights a response to eliminate the bacterium from the host.

8. What type of junction provides a stronger adhesion in epithelial tissue?

- A. Tight junctions
- B. Desmosomes**
- C. Adhering junctions
- D. Hemidesmosomes

Desmosomes are crucial for providing strong adhesion between epithelial cells. They are specialized structures that anchor adjacent cells together, allowing them to resist stretching and mechanical stress. This is particularly important in tissues that experience significant physical forces, such as the skin and cardiac muscle.

Desmosomes consist of dense protein plaques on the inner side of the cell membrane, linked by intermediate filaments, which contribute to the overall stability and resilience of the tissue. The strength of desmosomes comes from both the structural organization they provide and the ability to distribute mechanical loads across a larger area of the tissue, which prevents tearing and enhances the integrity of the epithelial layer. In contrast, tight junctions serve primarily to create a barrier to paracellular transport, preventing the passage of molecules between cells, while adhering junctions and hemidesmosomes fulfill different roles related to cell adhesion and interaction with the extracellular matrix. While all these junctions are essential for maintaining the function and integrity of epithelial tissues, desmosomes specifically stand out for their role in providing robust mechanical adhesion.

9. What process describes the movement of water across a semipermeable membrane?

- A. Diffusion
- B. Osmosis**
- C. Filtration
- D. Active transport

The movement of water across a semipermeable membrane is specifically referred to as osmosis. This process involves the movement of water molecules from an area of lower solute concentration to an area of higher solute concentration through a membrane that is permeable to water but not to certain solutes. Osmosis is crucial for maintaining cellular functions and homeostasis, as cells regulate their internal environments by controlling water levels. This process is distinct from diffusion, which refers to the general movement of solute molecules from an area of higher concentration to an area of lower concentration and does not specifically pertain to water. Filtration involves the movement of molecules and fluids through a membrane due to pressure differences, while active transport refers to the energy-dependent process that moves substances against their concentration gradient. These distinctions clarify why osmosis is the correct answer, as it specifically describes the behavior of water in relation to solute concentrations across semipermeable membranes.

10. What are the end products of the light reactions in photosynthesis?

- A. Glucose and Oxygen
- B. ATP, NADPH + H⁺, and Oxygen**
- C. Carbon Dioxide and Water
- D. ATP and NADH

The light reactions of photosynthesis occur in the thylakoid membranes of chloroplasts and are primarily responsible for converting light energy into chemical energy. The end products of these reactions are ATP, NADPH + H⁺, and oxygen. During the light reactions, chlorophyll absorbs light, which drives the process of splitting water molecules (photolysis) to release oxygen as a byproduct. This reaction also generates electrons that move through the electron transport chain, ultimately leading to the production of ATP through chemiosmosis and the generation of reducing power in the form of NADPH. ATP provides the energy, and NADPH serves as a reducing agent, both of which are essential for the subsequent Calvin cycle, where carbon fixation occurs, but these products are not carbon compounds like glucose. Therefore, the correct answer highlights the key outputs of the light reactions, emphasizing their role in energy and reducing power generation for the overall process of photosynthesis.

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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://asu-bio181exam2.examzify.com>

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

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