

ARIZONA STATE UNIVERSITY (ASU) BIO182 GENERAL BIOLOGY II EXAM 2 PRACTICE (SAMPLE) STUDY GUIDE



Prepare with structure. Pass with confidence



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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 best characterizes a stable internal environment maintained by homeostasis?**
 - A. Constant external conditions
 - B. Inner uniformity despite changes in external variables
 - C. A variety of cellular activities
 - D. Immune response activation
- 2. What are the main components of the cell cycle?**
 - A. Interphase and Cytokinesis
 - B. Interphase (G1, S, G2) and Mitotic phase (M)
 - C. Prophase, Metaphase, Anaphase, and Telophase
 - D. Interphase, Mitosis, and Meiosis
- 3. Which of the following attributes is linked to the concept of biogeography?**
 - A. Time travel
 - B. Species interactions
 - C. Geographic distribution
 - D. Genetic modifications
- 4. What role do cyclins play in the cell cycle?**
 - A. They provide energy for cellular processes
 - B. They regulate the progression of the cell cycle by activating cyclin-dependent kinases (CDKs)
 - C. They inhibit DNA replication during cell division
 - D. They act as structural components of the cell
- 5. DNA barcoding is associated with which area of biological study?**
 - A. Molecular phylogenetics
 - B. Taxonomy
 - C. Plesiomorphy
 - D. Analogous characteristics

- 6. What is often the result of sexual selection in species?**
- A. Natural selection
 - B. Sexual dimorphism
 - C. Genetic drift
 - D. Mutations
- 7. What is the primary function of the vascular system in plants?**
- A. To provide structural support
 - B. To transport water, nutrients, and sugars throughout the plant
 - C. To facilitate photosynthesis
 - D. To store energy in the form of starch
- 8. What does heterozygosity indicate about a population?**
- A. Number of homozygous individuals
 - B. Frequency of recessive alleles
 - C. Probability of different alleles being chosen from the population
 - D. Overall fitness of the population
- 9. What term describes a group of organisms believed to have evolved from a common ancestor?**
- A. Species
 - B. Clade
 - C. Family
 - D. Genus
- 10. What condition describes genotype frequencies remaining constant from generation to generation?**
- A. Equilibrium theory
 - B. Hardy-Weinberg equilibrium
 - C. Genetic stability
 - D. Population equilibrium

Answers

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

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Explanations

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1. Which best characterizes a stable internal environment maintained by homeostasis?

- A. Constant external conditions
- B. Inner uniformity despite changes in external variables**
- C. A variety of cellular activities
- D. Immune response activation

A stable internal environment maintained by homeostasis is characterized by inner uniformity despite changes in external variables. Homeostasis refers to the processes that organisms use to maintain a stable internal environment, which is crucial for optimal functioning and survival. This includes regulating temperature, pH, hydration, and concentration of ions and nutrients. Through homeostasis, an organism can create conditions that are consistent internally even when external conditions vary widely, such as changes in temperature, availability of water, or food sources. For example, humans maintain a body temperature around 37°C regardless of whether the external temperature is hot or cold. This capacity to regulate internal conditions allows cells and systems within the body to function effectively. Other options do not accurately describe homeostasis. Constant external conditions do not reflect the concept of homeostasis since it fundamentally involves responding to fluctuating external factors. A variety of cellular activities could occur without implying stable internal conditions, and immune response activation is specifically a reaction to external pathogens rather than a definition of homeostatic stability. Thus, the correct answer highlights the essence of homeostasis as the ability to maintain uniformity inside an organism in the face of changing external conditions.

2. What are the main components of the cell cycle?

- A. Interphase and Cytokinesis
- B. Interphase (G1, S, G2) and Mitotic phase (M)**
- C. Prophase, Metaphase, Anaphase, and Telophase
- D. Interphase, Mitosis, and Meiosis

The correct choice identifies the comprehensive structure of the cell cycle, which consists of two main phases: Interphase and the Mitotic phase (M). Interphase is further divided into three stages: G1 (Gap 1), S (Synthesis), and G2 (Gap 2). During G1, the cell grows and prepares to replicate its DNA. In the S phase, the cell's DNA is replicated, ensuring that each new cell will receive a complete set of chromosomes. G2 is a final phase of preparation before the cell enters mitosis, where it checks for any DNA errors and ensures it has the necessary components for cell division. The Mitotic phase (M) encompasses the actual process of cell division, which includes both mitosis and cytoplasmic division (cytokinesis). This phase is responsible for distributing the replicated genetic material into two daughter cells. This choice effectively captures the essential stages and organization of the cell cycle, making it the most accurate representation among the options presented. The other choices either misrepresent the components by listing incomplete phases or focus only on stages of mitosis rather than the entirety of the cell cycle.

3. Which of the following attributes is linked to the concept of biogeography?

- A. Time travel
- B. Species interactions
- C. Geographic distribution**
- D. Genetic modifications

The concept of biogeography is fundamentally concerned with the geographic distribution of species and ecosystems across different regions of the world. This field of study examines how historical, environmental, and ecological factors influence where organisms are found in relation to geographic features such as mountains, rivers, and climate zones. By understanding these distributions, researchers can gain insights into biodiversity, species evolution, and how organisms adapt to different habitats over time. The focus on geographic distribution allows scientists to analyze patterns of species diversity and the processes that lead to the current arrangements of flora and fauna. This understanding is critical for conservation efforts and predicting how species may respond to changes such as climate change or habitat destruction. Consequently, the correct answer aligns perfectly with the core principles of biogeography, highlighting its emphasis on the relationship between geography and biological communities.

4. What role do cyclins play in the cell cycle?

- A. They provide energy for cellular processes
- B. They regulate the progression of the cell cycle by activating cyclin-dependent kinases (CDKs)**
- C. They inhibit DNA replication during cell division
- D. They act as structural components of the cell

Cyclins play a crucial role in regulating the progression of the cell cycle by activating cyclin-dependent kinases (CDKs). These proteins are essential for the proper timing of the cell cycle events, including DNA replication and cell division. When cyclins bind to CDKs, they trigger a series of phosphorylation events that drive the cell through various phases of the cell cycle. Each phase has specific cyclins that bind to their corresponding CDKs, ensuring that the cell cycle progresses in a regulated manner. For example, different cyclin-CDK complexes are involved in the G1 phase, S phase (where DNA is replicated), and the M phase (mitosis). The precise regulation by cyclins helps to prevent errors during cell division, which could lead to problems like cancer if the cycle is not carefully controlled. This activation and regulation process is essential for cellular function and life, making cyclins critical components of the cell cycle machinery.

5. DNA barcoding is associated with which area of biological study?

- A. Molecular phylogenetics**
- B. Taxonomy
- C. Plesiomorphy
- D. Analogous characteristics

DNA barcoding is primarily associated with taxonomy. It involves the use of a short genetic sequence from a standard part of the genome to identify species. This technique is particularly useful in distinguishing between species that are morphologically similar or cryptic, where traditional methods of classification may fail. Molecular phylogenetics, while related, is more focused on the evolutionary relationships among species. It uses molecular data to construct evolutionary trees and understand the lineage of organisms, whereas DNA barcoding is specifically about using genetic data to classify and identify species at the level of taxonomy. In essence, DNA barcoding serves as a tool in the field of taxonomy, helping scientists accurately categorize and identify organisms. It utilizes molecular data but is distinct from the broader concept of molecular phylogenetics, which encompasses a wider scope, including the evolutionary analysis of relationships.

6. What is often the result of sexual selection in species?

- A. Natural selection
- B. Sexual dimorphism**
- C. Genetic drift
- D. Mutations

Sexual selection often leads to the development of sexual dimorphism, which is the divergence in physical characteristics between males and females of the same species. This phenomenon arises because individuals with certain traits are more likely to attract mates and reproduce. For example, in many species, males may develop elaborate features such as bright plumage or large antlers to be more appealing to potential female partners. These traits can signal health and genetic fitness, thus influencing reproductive success. In contrast, natural selection generally refers to the survival of the fittest related to environmental pressures, while genetic drift involves random changes in allele frequencies that can lead to variations in population genetics over time. Mutations introduce new genetic variations but do not directly relate to the selective pressures of mating choices that drive sexual dimorphism. Thus, the distinct characteristics observed in males and females as a result of sexual selection are a clear indicator of how reproductive strategies shape morphological traits in a species.

7. What is the primary function of the vascular system in plants?

- A. To provide structural support
- B. To transport water, nutrients, and sugars throughout the plant**
- C. To facilitate photosynthesis
- D. To store energy in the form of starch

The primary function of the vascular system in plants is to transport water, nutrients, and sugars throughout the plant. This system comprises two main types of tissues: xylem and phloem. The xylem is responsible for transporting water and dissolved minerals from the roots to the rest of the plant, while the phloem distributes the products of photosynthesis, such as sugars, from the leaves where they are produced to other parts of the plant for growth and energy. This transport mechanism is essential for maintaining the overall health and function of the plant. By moving water and nutrients to the cells that require them and distributing the energy-rich sugars produced during photosynthesis, the vascular system enables plants to grow, flourish, and adapt to their environments. While structural support is important, it is primarily provided by other tissues, such as sclerenchyma and collenchyma, rather than the vascular system itself. Similarly, photosynthesis occurs in the chloroplasts and does not directly involve the vascular tissues. Energy storage in the form of starch occurs in specialized tissues rather than being a direct function of the vascular system. This makes the transportation of key substances the central role of the vascular system in plant biology.

8. What does heterozygosity indicate about a population?

- A. Number of homozygous individuals
- B. Frequency of recessive alleles
- C. Probability of different alleles being chosen from the population**
- D. Overall fitness of the population

Heterozygosity refers to the presence of different alleles at a gene locus within an individual or a population. When this term is applied to a population, it indicates the genetic diversity present in that population. High heterozygosity suggests that there are many different alleles for a given gene among the individuals, which increases the probability of selecting different alleles from that population during reproduction. This genetic variability is crucial for the adaptability and resilience of a population, allowing it to respond more effectively to environmental changes or diseases. Therefore, by assessing heterozygosity, researchers can gauge the likelihood of different alleles being present and passed on to the next generation, contributing to the genetic richness of the population. This understanding plays a significant role in conservation biology, as populations with low heterozygosity may be more vulnerable to extinction due to their reduced ability to adapt to changes.

9. What term describes a group of organisms believed to have evolved from a common ancestor?

- A. Species
- B. Clade**
- C. Family
- D. Genus

A clade is a term used in phylogenetics to describe a group of organisms that includes an ancestral species and all its descendants. This definition emphasizes evolutionary relationships and illustrates how species are interconnected through common ancestry. Clades are often represented in phylogenetic trees, where branches depict the divergence of species from their common ancestor over time. The concept of a clade allows scientists to classify organisms in a way that reflects their evolutionary history rather than just superficial characteristics. This is particularly useful in understanding the complexities of evolution and the relationships that exist among various organisms in the natural world. In contrast, the other terms do not capture this concept of shared ancestry as effectively. A species generally refers to a group of organisms capable of interbreeding and producing fertile offspring, while family and genus are classifications in the hierarchical system of taxonomy that group species based on broader characteristics rather than direct descent. Thus, a clade is the most accurate term for describing a group of organisms evolved from a common ancestor.

10. What condition describes genotype frequencies remaining constant from generation to generation?

- A. Equilibrium theory
- B. Hardy-Weinberg equilibrium**
- C. Genetic stability
- D. Population equilibrium

The condition where genotype frequencies remain constant from generation to generation is known as Hardy-Weinberg equilibrium. This principle provides a mathematical framework for understanding population genetics and assumes that several conditions must be met for a population to maintain genetic stability over time. These conditions include a large population size, random mating, no mutations, no gene flow (migration), and no selection (natural or otherwise). Under the Hardy-Weinberg equilibrium, allele frequencies and corresponding genotype frequencies can be predicted using specific equations. This concept is fundamental in studying evolutionary processes, as deviations from this equilibrium indicate that one or more evolutionary forces, such as natural selection or genetic drift, are at work in the population. The other terms, while related to population dynamics, do not specifically address the concept of genotype frequencies remaining constant in the precise way that Hardy-Weinberg equilibrium does. Equilibrium theory and population equilibrium might refer broadly to stable states in populations, but they are not as specific or universally applicable as Hardy-Weinberg equilibrium in the context of genetics. Genetic stability is also a more general term that does not capture the specific mathematical and statistical context provided by Hardy-Weinberg.

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-bio182exam2.examzify.com>

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

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