

MISA BIOLOGY PRACTICE EXAM (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 stage of respiration is characterized by yielding 36 ATP?**
 - A. Glycolysis
 - B. Krebs Cycle
 - C. Electron Transport Chain
 - D. Anaerobic Respiration
- 2. What significant event occurs during Prophase 1 of meiosis?**
 - A. Chromosomes coil up and spindle forms
 - B. Homologous chromosomes separate
 - C. Nondisjunction occurs
 - D. Cells undergo mitosis
- 3. What is the main role of the nervous system?**
 - A. Controls movements and reflexes
 - B. Supports and protects organs
 - C. Regulates body temperature
 - D. Stores fat for energy
- 4. Which of the following structures is not involved in the synthesis or transport of proteins?**
 - A. Ribosome
 - B. Endoplasmic Reticulum
 - C. Nucleus
 - D. Lysosome
- 5. Which structure is responsible for organizing the motion of chromosomes during cell division?**
 - A. Centriole
 - B. Spindle fibers
 - C. Chromatid
 - D. Centromere

- 6. How does cytokinesis occur in animal cells?**
- A. Through the formation of a cell plate
 - B. By forming a cleavage furrow
 - C. By splitting the nucleus
 - D. Through binary fission
- 7. What type of bond forms between oppositely charged ions?**
- A. Covalent Bond
 - B. Hydrogen Bond
 - C. Ionic Bond
 - D. Metallic Bond
- 8. Which type of inheritance results from multiple genes contributing to a single trait?**
- A. Codominance
 - B. Incomplete Dominance
 - C. Polygenic Inheritance
 - D. Moiety Inheritance
- 9. What type of transport requires no energy to move substances across a membrane?**
- A. Active Transport
 - B. Facilitated Transport
 - C. Passive Transport
 - D. Endocytosis
- 10. What is a substrate in the context of enzymatic reactions?**
- A. Any molecule that promotes a reaction
 - B. The reactant that an enzyme acts upon
 - C. A product of an enzyme reaction
 - D. A type of enzyme

Answers

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

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Explanations

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1. Which stage of respiration is characterized by yielding 36 ATP?

- A. Glycolysis
- B. Krebs Cycle
- C. Electron Transport Chain**
- D. Anaerobic Respiration

The stage of respiration that is characterized by yielding 36 ATP is the Electron Transport Chain. This final stage of aerobic respiration occurs in the inner mitochondrial membrane, where electron carriers NADH and FADH₂, produced during earlier stages, donate electrons to the electron transport chain. As electrons are passed along the chain through a series of protein complexes, they release energy, which is used to pump protons (H⁺) across the mitochondrial membrane into the intermembrane space, creating a proton gradient. This gradient drives protons back across the membrane through ATP synthase, a process known as chemiosmosis, leading to the synthesis of a substantial amount of ATP. In total, when considering the entire process of aerobic respiration (which includes Glycolysis, the Krebs Cycle, and the Electron Transport Chain), up to 36 molecules of ATP can be produced from one molecule of glucose. This yield reflects the efficiency of the electron transport chain and its role in oxidative phosphorylation, making it the primary contributor to ATP generation in the cell.

2. What significant event occurs during Prophase 1 of meiosis?

- A. Chromosomes coil up and spindle forms**
- B. Homologous chromosomes separate
- C. Nondisjunction occurs
- D. Cells undergo mitosis

During Prophase 1 of meiosis, a significant event is the coiling up of chromosomes and the formation of the spindle apparatus. This stage is characterized by the condensation of chromatin into visible chromosomes, which allows them to become distinguishable under a microscope. Each chromosome pairs with its homologous chromosome, forming structures known as tetrads, where genetic recombination (crossing over) may occur. The spindle apparatus begins to form during this phase, preparing the cell for the subsequent stages of meiosis. This is essential for the proper segregation of chromosomes during the later stages of meiosis. The coiling of chromosomes and spindle formation are critical for ensuring that the genetic material is accurately divided into the resulting gametes. The other options refer to events that either occur in different stages of meiosis or are not characteristic of Prophase 1. The pairing of homologous chromosomes and genetic recombination are specifically relevant to this phase, highlighting its importance in meiosis and genetic diversity.

3. What is the main role of the nervous system?

- A. Controls movements and reflexes**
- B. Supports and protects organs
- C. Regulates body temperature
- D. Stores fat for energy

The main role of the nervous system is to control movements and reflexes. This complex network of neurons is responsible for transmitting signals throughout the body, allowing for coordination and communication between different body parts. It processes sensory information, enabling the body to respond to stimuli with appropriate motor responses. This includes both voluntary actions, like walking or talking, and involuntary reflex actions, such as pulling a hand away from a hot surface. While the other options describe important functions of different body systems, they do not pertain to the primary function of the nervous system. For instance, supporting and protecting organs relates to the skeletal and muscular systems, regulating body temperature is primarily a function of the integumentary and endocrine systems, and storing fat for energy is a role of adipose tissue within the endocrine and metabolic systems. Thus, the correct answer reflects the essential role of the nervous system in controlling and coordinating the body's movements and reactions.

4. Which of the following structures is not involved in the synthesis or transport of proteins?

- A. Ribosome
- B. Endoplasmic Reticulum
- C. Nucleus
- D. Lysosome**

The lysosome is not involved in the synthesis or transport of proteins. Lysosomes are primarily responsible for the degradation and recycling of cellular waste and macromolecules. They contain digestive enzymes that break down proteins, lipids, nucleic acids, and carbohydrates. This organelle plays a crucial role in cellular waste disposal and the recycling of components for use in other cellular processes, but it does not participate in the synthesis of proteins or their transport mechanisms. In contrast, ribosomes are the sites of protein synthesis, where amino acids are assembled into proteins based on the messenger RNA (mRNA) template. The endoplasmic reticulum, both rough and smooth, is directly involved in the transport and modification of proteins. The rough ER is studded with ribosomes and synthesizes proteins that are either secreted from the cell or sent to the cell membrane, while the smooth ER is involved in lipid synthesis and detoxification processes. The nucleus contains the genetic material and is the site of transcription, where mRNA is created from DNA, initiating the process of protein synthesis. Thus, the lysosome does not fit into the roles related to protein synthesis and transport.

5. Which structure is responsible for organizing the motion of chromosomes during cell division?

- A. Centriole**
- B. Spindle fibers
- C. Chromatid
- D. Centromere

The correct answer is the structure that plays a crucial role in ensuring accurate chromosome movement during cell division, specifically during mitosis and meiosis. This structure comprises microtubules that extend from the centrosome and attaches to chromosomes at their kinetochores. As the cell divides, these fibers contract and pull the chromatids apart to opposite poles of the cell, allowing for the equal distribution of genetic material. Centriole serves as an anchor point for spindle fibers but is not directly responsible for organizing the motion of chromosomes. Chromatids are the duplicated strands of a chromosome that are pulled apart during division, and the centromere is the region where sister chromatids are joined and where the spindle fibers attach; however, neither of these structures actively organizes the motion. Thus, spindle fibers are essential for the organization and movement of chromosomes during cell division.

6. How does cytokinesis occur in animal cells?

- A. Through the formation of a cell plate
- B. By forming a cleavage furrow**
- C. By splitting the nucleus
- D. Through binary fission

In animal cells, cytokinesis occurs through the formation of a cleavage furrow. This process begins during the late stages of mitosis, specifically in telophase, when the cell is ready to divide. The cleavage furrow is an indentation that forms around the middle of the parent cell. This indentation is facilitated by a contractile ring composed of actin and myosin, which are types of cytoskeletal proteins. As the contractile ring contracts, it pulls the plasma membrane inward, progressively pinching the cell into two separate daughter cells. This method of division is distinct from the way cytokinesis occurs in plant cells, where a cell plate forms instead. The cleavage furrow is essential for ensuring that the daughter cells are properly separated and that each receives the appropriate organelles and cytoplasm during cell division. This is a crucial step in the cell cycle, ensuring that cell division occurs efficiently and accurately in animal cells.

7. What type of bond forms between oppositely charged ions?

- A. Covalent Bond
- B. Hydrogen Bond
- C. Ionic Bond**
- D. Metallic Bond

An ionic bond forms between oppositely charged ions through the electrostatic attraction that arises when one atom donates one or more of its electrons to another atom. This transfer of electrons leads to the formation of positively charged cations and negatively charged anions. The strong attraction between these opposite charges is what constitutes an ionic bond. This type of bond is typically found in compounds formed from metals and non-metals, where the metal atom loses electrons and the non-metal gains them, resulting in a stable ionic compound. In contrast, covalent bonds involve the sharing of electron pairs between atoms, which typically occurs between non-metals. Hydrogen bonds, while important in various biological molecules like water and DNA, are significantly weaker interactions that occur between polarized molecules, rather than a stable bond formed between charged ions. Metallic bonds, on the other hand, are formed between metal atoms involving a 'sea' of delocalized electrons, which do not involve the transfer of charge like ionic bonds do. Thus, the unique nature of the ionic bond is specifically linked to the interactions between oppositely charged ions.

8. Which type of inheritance results from multiple genes contributing to a single trait?

- A. Codominance
- B. Incomplete Dominance
- C. Polygenic Inheritance**
- D. Moiety Inheritance

Polygenic inheritance is a type of genetic inheritance where multiple genes (often located on different chromosomes) contribute to the expression of a single trait. This results in a continuous range of phenotypes, rather than discrete categories, as seen in traits that follow Mendelian inheritance patterns. Examples of polygenic traits include human height, skin color, and eye color, where the combined effects of several genes lead to the phenotypic variation observed in the population. In polygenic inheritance, each gene may have a small additive effect on the final trait, and the interactions among these genes can result in a broad spectrum of outcomes. This complexity is what differentiates polygenic inheritance from other types of inheritance, where usually a single gene with clear dominant or recessive alleles determines the trait. Finally, the other types of inheritance mentioned, such as codominance and incomplete dominance, refer to interactions between alleles of a single gene rather than the cumulative effect of multiple genes on a single trait. Moiety inheritance is not a widely recognized term in genetic inheritance contexts. Thus, polygenic inheritance accurately captures the concept of multiple genes influencing one phenotypic characteristic.

9. What type of transport requires no energy to move substances across a membrane?

- A. Active Transport
- B. Facilitated Transport
- C. Passive Transport**
- D. Endocytosis

Transport that requires no energy to move substances across a membrane is classified as passive transport. This process relies on the natural tendency of particles to move from an area of higher concentration to an area of lower concentration, resulting in equilibrium. Simple diffusion and facilitated diffusion are key examples within this category, where substances like gases or small molecules can pass through the lipid bilayer or through specific protein channels without the expenditure of ATP. This mechanism is vital for cellular functions, allowing for the exchange of vital nutrients and waste products effortlessly. In contrast, active transport involves the use of energy to move substances against their concentration gradient, which is not the case in passive transport. Endocytosis requires energy as well, as it involves the engulfing of substances by the cell membrane to bring them into the cell. Thus, the principal hallmark of passive transport is its energy-free nature, making it fundamental in biological systems for maintaining homeostasis.

10. What is a substrate in the context of enzymatic reactions?

- A. Any molecule that promotes a reaction
- B. The reactant that an enzyme acts upon**
- C. A product of an enzyme reaction
- D. A type of enzyme

In the context of enzymatic reactions, a substrate refers specifically to the reactant that an enzyme acts upon. Enzymes are biological catalysts that facilitate chemical reactions by binding to their substrates, thereby lowering the activation energy needed for the reaction to take place. When the substrate binds to the enzyme's active site, it forms an enzyme-substrate complex, leading to the transformation of the substrate into products. This definition is essential because it highlights the relationship between enzymes and substrates, indicating that not all molecules involved in a reaction are substrates. For example, products are the substances produced as a result of the reaction, not the reactants acting upon the enzyme. Similarly, while some molecules may promote reactions, they do not qualify as substrates unless they are directly transformed by the enzyme. The term "type of enzyme" also does not apply, as it specifically refers to a category or classification of enzymes rather than their role in the reaction. Understanding the specific function of a substrate is crucial for grasping how enzymes operate in biochemical pathways.

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:

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

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