

IB DIPLOMA BIOLOGY PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

<https://ibdiplomabiology.examzify.com>



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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 is the term for a change in the genetic composition of a population over time?**
 - A. Mutation
 - B. Evolution
 - C. Adaptation
 - D. Speciation
- 2. What is the term for an alien species that has increased rapidly in number and negatively impacts the environment and native species?**
 - A. Endemic species
 - B. Invasive species
 - C. Threatened species
 - D. Exotic species
- 3. What concept describes the transfer of genetic information from DNA to mRNA to protein as being irreversible?**
 - A. Genetic code
 - B. Central dogma
 - C. Protein synthesis
 - D. Transcription process
- 4. What is an arteriole?**
 - A. A large vein
 - B. A very small artery
 - C. A type of capillary
 - D. A muscle fiber
- 5. What part of the female reproductive system is where pollen lands?**
 - A. Style
 - B. Ovary
 - C. Stigma
 - D. Sepal

- 6. What process produces NADPH in addition to ATP and requires the presence of water?**
- A. Cyclic photophosphorylation
 - B. Non-cyclic photophosphorylation
 - C. Calvin cycle
 - D. Light-independent reactions
- 7. What term describes the ability of interacting parts of a biological system to perform together and maintain function?**
- A. Integration
 - B. Interaction
 - C. Collaboration
 - D. Coordination
- 8. What is a virus that is integrated into a host's genome called?**
- A. Provirus
 - B. Plasmid
 - C. Viroid
 - D. Bacteriophage
- 9. Which of the following processes is involved in the carbon cycle?**
- A. Decomposition
 - B. Fossilization
 - C. Respiration
 - D. Both decomposition and respiration
- 10. What is the primary function of transcription factors in the regulation of gene expression?**
- A. To aid in DNA replication
 - B. To initiate translation
 - C. To modulate the rate of transcription
 - D. To form the ribosomal structure

Answers

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

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Explanations

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1. What is the term for a change in the genetic composition of a population over time?

- A. Mutation
- B. Evolution**
- C. Adaptation
- D. Speciation

The term that describes a change in the genetic composition of a population over time is evolution. Evolution encompasses the processes through which species undergo genetic changes, leading to variations in traits and adaptations over generations. It can occur due to mechanisms such as natural selection, genetic drift, and gene flow, all of which contribute to the gradual transformation of a population. This continuous change in the genetic makeup may ultimately lead to the development of new species, but the broader concept of change over time within populations is specifically defined as evolution. In contrast, mutation refers to a change in a single gene or DNA sequence, which can be a source of genetic variation but does not encompass the wider shifts in population genetics. Adaptation is a specific type of evolutionary change where organisms become better suited to their environment, and speciation is the process by which new species arise, often as a result of evolutionary changes. While related to evolution, adaptation and speciation are more specific phenomena within the broader evolutionary framework.

2. What is the term for an alien species that has increased rapidly in number and negatively impacts the environment and native species?

- A. Endemic species
- B. Invasive species**
- C. Threatened species
- D. Exotic species

The term "invasive species" refers specifically to non-native organisms that establish themselves in a new environment and proliferate to the point that they disrupt local ecosystems. These species often outcompete native flora and fauna for resources such as food and habitat, leading to negative ecological impacts. Invasive species can alter the dynamics of the ecosystem, reduce biodiversity, and in some cases, lead to the extinction of native species. In contrast, endemic species are those that are unique to a specific geographic location and are not found anywhere else, making them part of the natural biodiversity of that particular area. Threatened species are those at risk of extinction, but this term does not inherently imply rapid population increases or negative ecological impact. Exotic species can refer to non-native species introduced to an environment, but they do not necessarily become invasive unless they begin to proliferate aggressively and harm local ecosystems. Thus, "invasive species" is the most accurate term for describing organisms that disrupt their new environments through rapid growth and adverse effects on native species.

3. What concept describes the transfer of genetic information from DNA to mRNA to protein as being irreversible?

- A. Genetic code
- B. Central dogma**
- C. Protein synthesis
- D. Transcription process

The concept that describes the transfer of genetic information from DNA to mRNA to protein as being irreversible is the central dogma of molecular biology. This principle outlines the flow of genetic information within a biological system and defines the processes of transcription and translation. In this framework, DNA is transcribed into mRNA, which is then translated into a protein. This chain of events is unidirectional, meaning that once information is expressed as a protein, it cannot be reverted back to its original DNA form. This irreversibility is critical for understanding how genetic information is utilized in cells to produce functional proteins that carry out diverse biological functions. The other concepts listed, such as the genetic code, which refers to the specific sequences that determine amino acid placement, and the transcription process, which is just one part of the central dogma, do not capture the overall flow or the irreversible nature of this information transfer as effectively as the central dogma does.

4. What is an arteriole?

- A. A large vein
- B. A very small artery**
- C. A type of capillary
- D. A muscle fiber

An arteriole is defined as a very small artery that branches from a larger artery and leads into capillaries. Arterioles play a crucial role in regulating blood flow and blood pressure within the circulatory system. They are smaller than arteries and have more muscular and elastic walls, which allow them to adjust their diameter through vasoconstriction and vasodilation. This regulation is essential for directing blood to specific tissues based on their metabolic needs. The structure and function of arterioles make them distinct from a large vein, which is responsible for returning blood to the heart. Additionally, arterioles are not types of capillaries, which are even smaller vessels where the actual exchange of gases and nutrients occurs. Similarly, muscle fibers pertain to the tissue composition in muscles and are unrelated to the vascular system. Understanding the roles of arterioles within the circulatory system is fundamental in grasping how blood flow is controlled throughout the body.

5. What part of the female reproductive system is where pollen lands?

- A. Style
- B. Ovary
- C. Stigma**
- D. Sepal

The stigma is the part of the female reproductive system where pollen lands during the process of fertilization. It is typically the top portion of the pistil, which is composed of the stigma, style, and ovary. The stigma is often sticky or feathery, which aids in capturing pollen grains that are transferred from the male anthers of the flower. Once pollen adheres to the stigma, it can germinate and grow a pollen tube down the style to reach the ovary, where fertilization of the ovules occurs. This role is crucial for sexual reproduction in flowering plants, making the stigma an essential component of the reproductive process. The other choices pertain to different parts of the flower. The style connects the stigma to the ovary but does not directly facilitate pollen landing; the ovary houses the ovules, which develop into seeds after fertilization; and the sepal protects the developing flower bud and is not involved in the pollination process. Understanding the specific roles of each of these parts helps clarify how the reproductive system of flowering plants functions as a whole.

6. What process produces NADPH in addition to ATP and requires the presence of water?

- A. Cyclic photophosphorylation
- B. Non-cyclic photophosphorylation**
- C. Calvin cycle
- D. Light-independent reactions

The process that produces NADPH in addition to ATP and requires the presence of water is indeed non-cyclic photophosphorylation. This process occurs during the light-dependent reactions of photosynthesis in the thylakoid membranes of chloroplasts. In non-cyclic photophosphorylation, chlorophyll absorbs light energy, which is then used to excite electrons. Those excited electrons are transferred through a series of proteins in the electron transport chain. As these electrons move, they help to pump protons into the thylakoid lumen, creating a proton gradient that ultimately drives ATP synthesis. Additionally, water molecules are split in a process known as photolysis, providing both electrons and protons while releasing oxygen as a byproduct. The electrons that are derived from the splitting of water replace those lost by chlorophyll. Importantly, some of these excited electrons are used to reduce NADP⁺ to form NADPH, which is then utilized in the Calvin cycle for the fixation of carbon dioxide into organic molecules. In contrast, cyclic photophosphorylation only produces ATP and does not involve the splitting of water or the production of NADPH. The Calvin cycle operates using ATP and NADPH produced in the light-dependent reactions but does not perform the

7. What term describes the ability of interacting parts of a biological system to perform together and maintain function?

- A. Integration**
- B. Interaction
- C. Collaboration
- D. Coordination

The term that best describes the ability of interacting parts of a biological system to perform together and maintain function is integration. Integration refers to the process by which various components or systems work collectively to achieve a common goal or function. In biological contexts, this involves the harmonious interplay of different cells, tissues, organs, or systems that cooperate to maintain homeostasis and overall organismal health. For example, in the human body, the nervous system and endocrine system integrate signals to regulate processes like metabolism, growth, and response to stimuli. This collaborative functionality ensures that different parts of the organism are aligned and working effectively together. The concept of integration captures the essence of multiple systems functioning cohesively rather than just existing side by side. While coordination is often associated with similar ideas, it typically emphasizes the organization of activities to achieve goal-directed movement rather than the comprehensive interconnectedness implied in integration. Interaction and collaboration suggest working together but do not fully encompass the systematic unity and purpose found in biological integration.

8. What is a virus that is integrated into a host's genome called?

- A. Provirus**
- B. Plasmid
- C. Viroid
- D. Bacteriophage

A virus that is integrated into a host's genome is called a provirus. This term specifically refers to the viral DNA that has been incorporated into the DNA of a host cell. When a virus infects a host, particularly in the case of retroviruses, it can reverse transcribe its RNA genome into DNA and then integrate this DNA into the host cell's genome. Once integrated, the provirus can be replicated along with the host cell's DNA whenever the cell divides. This allows the virus to persist in the host for long periods, often without causing immediate harm, and can potentially reactivate later to produce new viral particles. In contrast, a plasmid is a small, circular piece of DNA found in bacteria and can replicate independently of chromosomal DNA, but it is not involved in viral integration. A viroid is a small infectious agent that primarily infects plants and consists solely of a short strand of circular RNA, lacking the protein coat typical of viruses. A bacteriophage, or phage, is a type of virus that specifically infects bacteria but does not integrate its genome into the host in the same way that a provirus does. Thus, the term "provirus" precisely describes the integration of viral genetic material into a

9. Which of the following processes is involved in the carbon cycle?

- A. Decomposition
- B. Fossilization
- C. Respiration
- D. Both decomposition and respiration**

The carbon cycle is a critical ecological process that involves the movement of carbon through various parts of the Earth, including the atmosphere, biosphere, hydrosphere, and lithosphere. Both decomposition and respiration are integral processes in this cycle. Decomposition refers to the breakdown of organic matter by decomposers, such as bacteria and fungi. When organisms die, their bodies are processed by these microorganisms, which release carbon back into the soil and atmosphere in the form of carbon dioxide (CO₂). This process enriches the soil with nutrients and plays a vital role in carbon recycling. Respiration is another key process where animals, plants, and microorganisms convert organic molecules (primarily glucose) into carbon dioxide and water, releasing energy for cellular functions. During respiration, carbon that was originally captured by plants through photosynthesis is returned to the atmosphere. This constant exchange between photosynthesis, respiration, and decomposition maintains the balance of carbon in the environment. The option indicating both decomposition and respiration correctly recognizes that these processes work together to cycle carbon through ecosystems, making it essential in understanding the full scope of the carbon cycle. Fossilization, while related to carbon storage, is a longer-term process that does not play a direct role in the cyclical nature of carbon as

10. What is the primary function of transcription factors in the regulation of gene expression?

- A. To aid in DNA replication
- B. To initiate translation
- C. To modulate the rate of transcription**
- D. To form the ribosomal structure

Transcription factors play a crucial role in the regulation of gene expression by modulating the rate of transcription. They are specific proteins that bind to particular DNA sequences, often in the promoter region of genes, and serve to enhance or inhibit the recruitment of RNA polymerase, the enzyme responsible for synthesizing mRNA from the DNA template. By doing so, transcription factors can either increase or decrease the transcription of target genes, allowing for precise control over when and how much of a gene product is produced in response to various cellular signals or environmental conditions. This regulatory mechanism is fundamental for cell differentiation, response to stimuli, and maintaining homeostasis within organisms. The other options relate to different processes: aiding in DNA replication involves a different set of proteins and enzymes; initiation of translation relates to the formation of ribosomes and interaction with mRNA; and the formation of ribosomal structures is unrelated to transcription regulation.

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://ibdiplomabiology.examzify.com>

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

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