IB Diploma Biology Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

This is a sample study guide. To access the full version with hundreds of questions,

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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.

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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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

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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!

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Questions

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1. What is the primary role of endocrine glands?

A. To secrete external digestive enzymes

B. To produce hormones for internal regulation

C. To filter blood and remove toxins

D. To protect the body from pathogens

2. How is the electron transport chain primarily defined?

A. A mechanism for storing genetic information

B. A pathway for cellular respiration

C. A sequence of proteins transferring electrons

D. An organelle within the cell

3. Which type of plant hormones regulate growth and development in response to environmental stimuli?

A. Auxins

B. Gibberellins

C. Cytokinins

D. Phytohormones

4. What is the term for the state of being able to resist a disease after exposure to its causative agent?

A. Resistance

B. Allergy

C. Immunity

D. Susceptibility

5. What type of immune cell is responsible for producing large amounts of specific antibodies?

A. B-cells

B. T-cells

C. Plasma cells

D. Macrophages

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6. Which class of mutations would result in a significant alteration of a protein?

A. Silent mutation

B. Missense mutation

C. Nonsense mutation

D. Point mutation

7. What term refers to enclosed environments that allow natural conditions to be observed under controlled circumstances?

A. Geocosm

B. Microsystem

C. Mesocosm

D. An ecosystem

8. What is the clear, yellowish liquid part of the blood that carries blood cells called?

A. Serum

B. Whole blood

C. Plasma

D. Lymph

9. What are Variable Number Tandem Repeats (VNTRs) primarily used for?

A. Protein synthesis

B. Genetic profiling

C. Cell division

D. RNA transcription

10. What type of enzyme functions within the cell in which it was produced?

A. Extracellular enzyme

B. Endocellular enzyme

C. Intracellular enzyme

D. Intercellular enzyme

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Answers

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

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Explanations

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1. What is the primary role of endocrine glands?

A. To secrete external digestive enzymes

B. To produce hormones for internal regulation

C. To filter blood and remove toxins

D. To protect the body from pathogens

The primary role of endocrine glands is to produce hormones for internal regulation. Endocrine glands, such as the pituitary, thyroid, and adrenal glands, release hormones directly into the bloodstream. These hormones act as chemical messengers that travel to various organs and tissues to regulate numerous physiological processes, including growth and development, metabolism, and homeostasis. By secreting hormones into the circulatory system, endocrine glands play a crucial role in maintaining internal balance within the body, adapting to changes in the environment, and coordinating complex bodily functions. This regulation is essential for overall health and well-being. The other options involve functions that do not pertain to the primary role of endocrine glands. For instance, while some glands, such as salivary glands or pancreatic exocrine cells, are involved in secretion related to digestion, they are not classified as endocrine glands. Therefore, the emphasis on hormonal secretion for internal regulation defines the endocrine system distinctly.

2. How is the electron transport chain primarily defined?

A. A mechanism for storing genetic information

B. A pathway for cellular respiration

C. A sequence of proteins transferring electrons

D. An organelle within the cell

The electron transport chain is primarily defined as a sequence of proteins transferring electrons. This series of protein complexes, located within the inner mitochondrial membrane in eukaryotes, plays a crucial role in cellular respiration. During this process, electrons are transferred through the chain from electron donors such as NADH and FADH2 to acceptors like oxygen. This transfer occurs through a series of redox reactions, where electrons lose energy at each step. The energy released during these transfers is used to pump protons across the membrane, creating a proton gradient that ultimately drives the synthesis of ATP through ATP synthase. This definition is fundamental to understanding cellular respiration, as the electron transport chain is a key step in oxidative phosphorylation, where most of the ATP produced during respiration is generated. The focus on the protein sequence emphasizes how the structural arrangement and interactions of these proteins are vital for the efficient transfer of electrons and energy production within the cell.

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3. Which type of plant hormones regulate growth and development in response to environmental stimuli?

A. Auxins

B. Gibberellins

C. Cytokinins

D. Phytohormones

The correct answer is phytohormones, as they encompass a broad category of plant hormones that regulate growth and development in response to environmental stimuli. Phytohormones, including auxins, gibberellins, and cytokinins, play crucial roles in processes such as cell elongation, fruit development, and the response of plants to light and gravity. Auxins, for example, are primarily involved in the elongation of plant cells and help in processes like phototropism, where plants grow towards light. Gibberellins promote seed germination and stem elongation, while cytokinins are involved in cell division and shoot formation. While each of these hormones has specific roles, referring to them collectively as phytohormones highlights their shared function in responding to environmental cues and regulating various growth processes in plants.

4. What is the term for the state of being able to resist a disease after exposure to its causative agent?

A. Resistance

B. Allergy

C. Immunity

D. Susceptibility

The term that defines the ability to resist a disease after exposure to its causative agent is "immunity." This concept refers to the body's capacity to recognize and defend against pathogens, such as viruses and bacteria, after having encountered them. Immunity can be achieved through natural infection, where the body develops a response to a specific pathogen, or through vaccination, which introduces a harmless part of the pathogen to stimulate an immune response without causing the disease. Resistance is a more general term that does not specifically imply the development of a protective response following exposure to a pathogen. An allergy involves an inappropriate immune response to normally harmless substances, which is distinct from immunity. Susceptibility refers to the likelihood of an individual to be affected by a disease, which is the opposite of being immune. Thus, immunity is the most accurate term to describe the state of being able to resist disease following exposure to its causative agent.

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5. What type of immune cell is responsible for producing large amounts of specific antibodies?

A. B-cells

B. T-cells

C. Plasma cells

D. Macrophages

The correct answer is plasma cells, as they are a specialized form of B-cells that have differentiated in response to an antigen. Upon activation by the presence of a specific pathogen, B-cells undergo a process of clonal expansion and differentiation, leading to the formation of plasma cells. These plasma cells are specifically designed to produce and secrete large quantities of antibodies, which are critical components of the adaptive immune response. The antibodies produced by plasma cells bind to antigens on pathogens, marking them for destruction by other immune cells or neutralizing their effects directly. While B-cells are the precursor to plasma cells and are involved in the initial recognition of antigens, it is the plasma cells that are primarily responsible for the production of antibodies in significant amounts. T-cells play crucial roles in cell-mediated immunity and in helping B-cells but do not produce antibodies themselves. Macrophages are involved in phagocytosis and antigen presentation rather than antibody production. Thus, the specific role of plasma cells in antibody production distinguishes them as the correct choice in this context.

6. Which class of mutations would result in a significant alteration of a protein?

A. Silent mutation

B. Missense mutation

C. Nonsense mutation

D. Point mutation

A missense mutation leads to a significant alteration of a protein because it involves a change in a single nucleotide that results in the substitution of one amino acid for another in the protein sequence. This alteration can affect the protein's structure and function, potentially altering its activity, stability, or interactions with other molecules. Since amino acids have different properties, even a single change can significantly influence the three-dimensional conformation of the protein, ultimately impacting its role in biological processes. In contrast, a silent mutation does not change the amino acid sequence of the protein, meaning there is typically no effect on the protein's function. A nonsense mutation introduces a premature stop codon, resulting in a truncated protein that may be nonfunctional, though not all nonsense mutations will lead to significant changes depending on the position of the stop codon. While a point mutation can refer to a single nucleotide change, it encompasses silent, missense, and nonsense mutations. Therefore, not all point mutations will result in significant alterations to proteins, but missense mutations specifically result in functional variations.

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7. What term refers to enclosed environments that allow natural conditions to be observed under controlled circumstances?

A. Geocosm

B. Microsystem

C. Mesocosm

D. An ecosystem

The term "mesocosm" refers to a specific type of experimental setup that allows researchers to study ecological processes in a controlled yet semi-natural environment. A mesocosm is typically larger than a small-scale laboratory experiment but smaller than a full natural ecosystem. It provides an intermediate scale that allows scientists to manipulate variables while still maintaining the complexity of natural conditions. Using a mesocosm enables scientists to observe interactions between organisms and their environment in a way that simulates real-world conditions, making it possible to study the effects of various factors, such as temperature, light, and nutrient levels, on biological processes. This controlled environment can include aquatic or terrestrial settings and is valuable for ecological research, conservation studies, and the assessment of environmental impacts. While the other terms are relevant to environmental science and biology, they do not specifically describe the controlled, enclosed setting that a mesocosm represents. For instance, "geocosm" is less commonly used and may refer to theoretical models of Earth's systems. "Microsystem" generally refers to smaller setups than a mesocosm, often focusing on microscopic life or minimal ecological interactions. An "ecosystem" is a broader term that encompasses all living and non-living components in a natural area without the confines of

8. What is the clear, yellowish liquid part of the blood that carries blood cells called?

A. Serum

B. Whole blood

C. Plasma

D. Lymph

The clear, yellowish liquid part of the blood that carries blood cells is called plasma. Plasma makes up about 55% of total blood volume and serves several critical functions within the circulatory system. It is primarily composed of water, but it also contains proteins, electrolytes, hormones, nutrients, and waste products. The presence of proteins such as albumin, globulins, and fibrinogen within plasma is essential for maintaining osmotic balance, transporting substances, and facilitating blood clotting processes. By suspending blood cells (red blood cells, white blood cells, and platelets), plasma plays a vital role in ensuring their efficient movement throughout the body. The other choices refer to different components or contexts related to blood. Serum is the liquid that remains after coagulation when clotting factors have been removed; whole blood includes both plasma and blood cells; lymph is a fluid that is part of the lymphatic system and plays a role in immune responses and fluid balance.

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9. What are Variable Number Tandem Repeats (VNTRs) primarily used for?

A. Protein synthesis

B. Genetic profiling

C. Cell division

D. RNA transcription

Variable Number Tandem Repeats (VNTRs) are primarily used for genetic profiling due to their high variability between individuals. VNTRs are regions in the genome where a short nucleotide sequence is repeated multiple times. The number of repeats can differ significantly between individuals, making them effective markers for identification purposes. In the context of genetic profiling, VNTRs can be analyzed in forensic science, paternity testing, and population genetics. By comparing the number and pattern of these repeats in DNA samples, scientists can establish genetic relationships or identify individuals with a high degree of certainty. This application relies on the unique pattern of VNTRs in each person's DNA, which is influenced by both genetic inheritance and random mutation. Other options do not relate to the primary use of VNTRs. For instance, protein synthesis, cell division, and RNA transcription involve processes that relate to gene expression and cellular functionality, rather than the specific variability and identification potential provided by VNTRs.

10. What type of enzyme functions within the cell in which it was produced?

A. Extracellular enzyme

B. Endocellular enzyme

C. Intracellular enzyme

D. Intercellular enzyme

Intracellular enzymes are those that operate within the same cell in which they are synthesized. These enzymes facilitate various biochemical reactions, such as metabolism, biosynthesis, and other essential processes, directly in the cellular environment. For example, enzymes like ATP synthase produce ATP during cellular respiration within the mitochondria, where they are produced and utilized. The character of these enzymes is crucial because they help regulate pathways uniquely suited to the cell's metabolic needs without exporting their activity elsewhere. This localized functioning is vital for maintaining cellular homeostasis and enabling complex biochemical networks within the cell.

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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://ibdiplomabiology.examzify.com

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

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