PRAXIS II BIOLOGY (5235) PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED 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. 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!

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Questions

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1. Which type of organisms cannot survive in the presence of oxygen?

A. Facultative anaerobes

B. Obligate anaerobes

C. Aerobes

D. Photoautotrophs

2. Which organisms are primarily responsible for atmospheric nitrogen fixation?

A. Bacteria and archaea

B. Plants and animals

C. Fungi and algae

D. Protozoa and viruses

3. What is the definition of a protease enzyme?

A. An enzyme that synthesizes RNA from DNA

B. An enzyme that catalyzes lipid digestion

C. A digestive enzyme that digests proteins

D. A hormone that regulates carbohydrate metabolism

4. What role do surface proteins primarily play in cellular function?

A. Encoding genetic information

B. Transporting nutrients

C. Intercellular communication and linking cells

D. Generating energy through metabolism

5. What constitutes a nucleosome?

A. A single DNA strand in a chromosome

B. A section of DNA wrapped around 8 histone proteins

C. A chromosome consisting of multiple DNA segments

D. A ribosome used in protein synthesis

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6. How does the cell maintain sodium ion concentrations compared to outside the cell?

A. By passive diffusion

B. By active transport mechanisms

C. By osmosis

D. By vesicular transport

7. What are promoter regions in DNA?

A. Sections of DNA that code for proteins

B. DNA sequences recognized and bound by RNA polymerase

C. Regions responsible for DNA replication

D. Segments that determine genetic variation

8. What is the primary function of veins in the circulatory system?

A. Transport oxygen-rich blood from the heart

B. Return deoxygenated blood to the right side of the heart

C. Distribute nutrients to tissues

D. Regulate blood pressure

9. Which enzyme catalyzes the carboxylation of RuBP in the dark reactions?

A. Phosphofructokinase

B. RuBisCo

C. PEP carboxylase

D. NADP+ reductase

10. What causes genetic drift?

A. Large-scale migration of a population

B. Change in the gene pool of a small population due to chance

C. Introduction of new mutations within a population

D. Random mating within a large population

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Answers

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1. B
2. A
3. C
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 type of organisms cannot survive in the presence of oxygen?

A. Facultative anaerobes

B. Obligate anaerobes

C. Aerobes

D. Photoautotrophs

Obligate anaerobes are organisms that are specifically adapted to live in environments devoid of oxygen. They rely on anaerobic respiration or fermentation processes to generate energy. For these organisms, the presence of oxygen can be toxic, leading to the production of reactive oxygen species that can damage cellular components. Unlike facultative anaerobes, which can switch between aerobic and anaerobic metabolism, obligate anaerobes are entirely dependent on anaerobic conditions for their survival. Facultative anaerobes can thrive in both the presence and absence of oxygen, while aerobes require oxygen for their metabolic processes. Photoautotrophs are organisms that use light energy to produce organic compounds, typically relying on oxygen in their metabolic pathways. Thus, the characteristics of obligate anaerobes make them uniquely suited to environments where oxygen is absent.

2. Which organisms are primarily responsible for atmospheric nitrogen fixation?

A. Bacteria and archaea

B. Plants and animals

C. Fungi and algae

D. Protozoa and viruses

Atmospheric nitrogen fixation occurs primarily through the action of certain bacteria and archaea, which possess the unique ability to convert nitrogen gas (N_2) from the atmosphere into ammonia (NH_3), a form that can be utilized by living organisms. This process is essential for the nitrogen cycle, as nitrogen is a vital nutrient necessary for the synthesis of amino acids, proteins, and nucleic acids. Many free-living and symbiotic bacteria are involved in nitrogen fixation. For example, the genus Rhizobium forms nodules on legume roots and provides them with ammonia, while cyanobacteria also fix nitrogen in aquatic environments. Archaea, particularly certain methanogens, contribute to nitrogen fixation in extreme environments. In contrast, plants and animals do not fix atmospheric nitrogen themselves; they depend on nitrogen-fixing organisms to convert atmospheric nitrogen into usable forms. Similarly, fungi and algae do not perform nitrogen fixation in a significant way; while some algae, like cyanobacteria, can fix nitrogen, the majority of nitrogen-fixing activities are performed by specialized bacteria. Protozoa and viruses play different roles in ecosystems and do not contribute to the process of nitrogen fixation. Thus, the primary responsibility for atmospheric nitrogen fixation lies with bacteria and archaea.

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3. What is the definition of a protease enzyme?

A. An enzyme that synthesizes RNA from DNA

B. An enzyme that catalyzes lipid digestion

C. A digestive enzyme that digests proteins

D. A hormone that regulates carbohydrate metabolism

A protease enzyme is specifically defined as a digestive enzyme that catalyzes the breakdown of proteins into smaller polypeptides or amino acids. This process is essential for various biological functions, as proteins are polymers of amino acids that must be broken down into their building blocks to be absorbed and utilized by the body. Proteases facilitate this process by cleaving the peptide bonds that link amino acids together in protein molecules. The unique activity of proteases plays a critical role in digestion, where they help to process dietary proteins consumed in food. They are produced in different forms throughout the digestive system, including in the stomach and pancreas, and are activated in the gastrointestinal tract. This enzymatic action is vital not only for digestion but also for numerous physiological processes, including cellular regulation, signaling, and immune responses. Understanding the specific function of proteases is important for various applications, including medical, culinary, and biotechnological fields, where manipulating protein digestion can have significant implications.

4. What role do surface proteins primarily play in cellular function?

A. Encoding genetic information

B. Transporting nutrients

C. Intercellular communication and linking cells

D. Generating energy through metabolism

Surface proteins primarily play a crucial role in intercellular communication and linking cells. These proteins are embedded in the plasma membrane of cells and serve as receptors, allowing cells to communicate with each other by recognizing and binding to specific signaling molecules, such as hormones or neurotransmitters. This communication is vital for coordinating various biological processes, including immune responses, tissue repair, and cellular differentiation. Additionally, surface proteins can function as adhesion molecules that help cells adhere to one another, forming tissues and organs. This linking is essential for maintaining the structural integrity of tissues and facilitating cellular cooperation. In contrast, the other roles mentioned are not directly associated with surface proteins. While some proteins do encode genetic information, that role is primarily reserved for nucleic acids like DNA and RNA. Transporting nutrients is typically managed by specific transport proteins, which can be distinct from surface proteins. Generating energy through metabolism involves various enzymes and cellular structures like mitochondria rather than surface proteins. Thus, the focus on intercellular communication and cell linking underscores why this role of surface proteins is vital in cellular function.

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5. What constitutes a nucleosome?

A. A single DNA strand in a chromosome

B. A section of DNA wrapped around 8 histone proteins

C. A chromosome consisting of multiple DNA segments

D. A ribosome used in protein synthesis

A nucleosome is defined as a structural unit of chromatin, which consists of a segment of DNA that is wrapped around a core of eight histone proteins. This arrangement plays a crucial role in the organization of DNA within the cell nucleus, allowing for the compaction of DNA so that it can fit within the confines of the nucleus while still being accessible for processes like transcription and replication. The positive charge of the histone proteins facilitates the binding to the negatively charged DNA, creating this essential structure which serves as a fundamental component of eukaryotic cells. The nucleosome is often described in the context of the "beads on a string" model of chromatin architecture, where the "beads" are the nucleosomes and the "string" is the linker DNA between them.

6. How does the cell maintain sodium ion concentrations compared to outside the cell?

A. By passive diffusion

B. By active transport mechanisms

C. By osmosis

D. By vesicular transport

The cell maintains sodium ion concentrations compared to the outside of the cell primarily through active transport mechanisms. This involves specialized proteins known as sodium-potassium pumps, which use energy in the form of ATP to transport sodium ions out of the cell while bringing potassium ions in. This process is essential for establishing the electrochemical gradient across the cell membrane, which is critical for various cellular functions, including nerve impulse transmission and muscle contraction. Active transport differs from passive diffusion in that it requires energy to move ions against their concentration gradient. In the case of sodium ions, the concentration is typically higher outside the cell than inside, necessitating the use of energy to expel sodium radicals from the cell. Osmosis pertains to the movement of water across a semipermeable membrane and does not involve the direct transport of sodium ions. Vesicular transport involves the movement of larger molecules or groups of molecules rather than ions, and while it can still play a role in cellular transport processes, it does not directly address the maintenance of sodium ion concentrations.

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7. What are promoter regions in DNA?

A. Sections of DNA that code for proteins

B. DNA sequences recognized and bound by RNA polymerase

C. Regions responsible for DNA replication

D. Segments that determine genetic variation

Promoter regions in DNA are essential elements that play a critical role in the initiation of transcription. They are specific DNA sequences located upstream of the transcription start site of a gene. The primary function of promoter regions is to serve as the binding sites for RNA polymerase, the enzyme responsible for synthesizing RNA from the DNA template. When RNA polymerase binds to the promoter, it is positioned to start transcribing the gene into messenger RNA (mRNA), which will then be translated into a protein. The sequence and structure of promoter regions can vary, allowing for the regulation of gene expression in response to different cellular signals and conditions. This distinction is crucial because it sets promoter regions apart from other DNA elements, such as coding regions that directly determine the sequences of proteins or replication origins, which are involved in DNA duplication. Additionally, while genetic variation can involve changes in sequences within or near promoter regions, the defining characteristic of promoters is their role in the transcription process rather than in genetic diversity itself. Thus, the identification of promoter regions as DNA sequences recognized and bound by RNA polymerase accurately encapsulates their function in gene expression.

8. What is the primary function of veins in the circulatory system?

A. Transport oxygen-rich blood from the heart

B. Return deoxygenated blood to the right side of the heart

C. Distribute nutrients to tissues

D. Regulate blood pressure

Veins play a crucial role in the circulatory system, primarily by returning deoxygenated blood back to the right side of the heart. After oxygen is delivered to the body's tissues through arterial circulation, the blood collects carbon dioxide and other metabolic wastes. This deoxygenated blood is then channeled into veins, which are designed to carry it back to the heart. Veins have valves that prevent backflow and assist in the return of blood, especially from the lower parts of the body. The design of veins allows them to accommodate a large volume of blood at low pressure, facilitating the efficient return of blood to the heart for reoxygenation in the lungs. Thus, the primary function of veins is not only essential for maintaining proper circulatory flow but also for ensuring that oxygen demand is met throughout the body. While distributing nutrients and regulating blood pressure are important aspects of overall circulation, they are more characteristic of other components of the circulatory system like arteries and arterioles. Arteries are responsible for transporting oxygen-rich blood away from the heart, while blood pressure regulation involves various mechanisms that include both the heart and the blood vessels as a system.

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9. Which enzyme catalyzes the carboxylation of RuBP in the dark reactions?

A. Phosphofructokinase

B. RuBisCo

C. PEP carboxylase

D. NADP+ reductase

The enzyme that catalyzes the carboxylation of ribulose 1,5-bisphosphate (RuBP) in the dark reactions, which are also known as the Calvin cycle, is RuBisCo (ribulose bisphosphate carboxylase/oxygenase). This enzyme plays a critical role in photosynthesis by facilitating the first major step of carbon fixation. During this process, RuBisCo helps incorporate carbon dioxide into RuBP, resulting in a six-carbon compound that eventually splits into two molecules of 3-phosphoglycerate (3-PGA). RuBisCo is unique because it can catalyze both carboxylation and oxygenation reactions, which are essential for the process of photosynthesis. However, its primary function in this context is to catalyze the reaction that incorporates carbon dioxide into the Calvin cycle, making it a key player in the conversion of inorganic carbon into an organic form. In contrast, the other enzymes mentioned have different functions: Phosphofructokinase is involved in glycolysis, PEP carboxylase is used in C4 photosynthesis and assists in fixing carbon in certain plant types, while NADP+ reductase is involved in the light reactions of photosynthesis

10. What causes genetic drift?

A. Large-scale migration of a population

B. Change in the gene pool of a small population due to chance

C. Introduction of new mutations within a population

D. Random mating within a large population

Genetic drift is a phenomenon that refers to the change in the frequency of alleles in a population's gene pool due to random sampling effects, particularly in small populations. When a population is small, chance events can have a more pronounced effect on the genetic composition of that population. This might occur, for example, when a few individuals randomly survive a disaster or when certain individuals happen to reproduce while others do not, purely by chance. As a result, some alleles might become more common while others diminish or disappear entirely, leading to a shift in the genetic makeup of that population. This concept is critical because it illustrates how variation in allele frequencies can occur independently of natural selection. It highlights the role of chance in the evolutionary process, which can lead to significant changes over generations, especially when populations are reduced in size. In contrast, large-scale migration of a population generally involves gene flow, which can introduce or remove alleles from the gene pool but does not lead to genetic drift. Similarly, the introduction of new mutations contributes to variation within a population but is not the same as genetic drift. Lastly, random mating within a large population does not significantly affect allele frequencies since the population is large enough that chance events do not drastically alter the genetic structure.

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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://praxis2biology5235.examzify.com

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

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