

NYSTCE 160 – 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. What is one of the potential results of immunodeficiencies?**
 - A. Increased resistance to infections
 - B. Failure to produce antibodies
 - C. Enhanced immune response
 - D. Normal immune function
- 2. Which of the following is NOT a common vector used for DNA transfer?**
 - A. Viruses
 - B. Bacteria
 - C. Plasmids
 - D. Fungi
- 3. What is the function of ribosomes in a cell?**
 - A. Synthesize glucose
 - B. Store genetic information
 - C. Produce proteins
 - D. Degrade waste materials
- 4. How many amino acids are considered essential for human health?**
 - A. Six
 - B. Seven
 - C. Eight
 - D. Nine
- 5. Why does crop productivity decline when leaves begin to wilt?**
 - A. Decrease in root growth
 - B. Stomata close, preventing carbon dioxide from entering
 - C. Increase in soil temperature
 - D. Reduction in soil nutrients
- 6. What are the two classifications of lichens?**
 - A. Microlichen and Macrolinchen
 - B. Macrolichen and Megalichen
 - C. Microphyte and Macrophyte
 - D. Algal and Fungal

- 7. What is the chemical compound name of the Hydroxyl group?**
- A. Aldehyde
 - B. Alcohol
 - C. Ester
 - D. Ketone
- 8. Which part of the flower structure develops into a protective seed coat?**
- A. The ovule wall
 - B. The stamen
 - C. The pistil
 - D. The petal
- 9. What is the final electron acceptor in the electron transport chain?**
- A. Nitrogen
 - B. Hydrogen
 - C. Carbon dioxide
 - D. Oxygen
- 10. When does the Calvin Cycle occur in photosynthesis?**
- A. When sunlight is absorbed
 - B. When carbon is fixed from CO₂ to glucose
 - C. When existing carbon in the cell breaks down from 6 to 3
 - D. When chlorophyll absorbs light

Answers

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

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Explanations

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1. What is one of the potential results of immunodeficiencies?

- A. Increased resistance to infections
- B. Failure to produce antibodies**
- C. Enhanced immune response
- D. Normal immune function

Immunodeficiencies refer to conditions in which the immune system's ability to fight infections and diseases is compromised or entirely absent. These can be inherited or acquired through various factors, such as infections, malnutrition, or medical treatments. One significant outcome of immunodeficiencies is the failure to produce antibodies, which are crucial proteins that help identify and neutralize pathogens like bacteria and viruses. In a healthy immune system, B cells produce antibodies in response to infections, providing both immediate and long-term protection. In individuals with immunodeficiencies, the body may not produce adequate amounts of antibodies or may fail to create them altogether, leading to increased susceptibility to infections and a reduced ability to mount an effective immune response. Thus, the failure to produce antibodies directly correlates with a weakened immune defense, making it a critical consequence of immunodeficiency. By focusing on this aspect, it becomes clear why the failure to produce antibodies is a defining characteristic of immunodeficiencies, contrasting sharply with the notions of increased resistance, enhanced immune response, or normal immune function.

2. Which of the following is NOT a common vector used for DNA transfer?

- A. Viruses
- B. Bacteria
- C. Plasmids
- D. Fungi**

The choice of fungi as not being a common vector used for DNA transfer is correct because, in genetic engineering and molecular biology, the most frequently used vectors are those that provide efficient pathways for the introduction and replication of foreign DNA in host organisms. Viruses, bacteria, and plasmids are widely used due to their established systems for gene delivery. Viruses, specifically engineered ones, can infect host cells and deliver genetic material efficiently. Bacteria can take up plasmids containing foreign DNA through processes like transformation, and plasmids themselves are small circular DNA molecules used extensively to manipulate gene expression in various organisms. Although fungi can occasionally be used in genetic studies and biotechnological applications, they are not primary vectors compared to the more conventional or efficient options like viruses and plasmids. This distinction helps clarify why fungi are not categorized as common vectors for DNA transfer in the context of genetic engineering.

3. What is the function of ribosomes in a cell?

- A. Synthesize glucose
- B. Store genetic information
- C. Produce proteins**
- D. Degrade waste materials

Ribosomes play a crucial role in the process of protein synthesis within a cell. They are composed of ribosomal RNA (rRNA) and proteins, and can be found either floating freely in the cytoplasm or attached to the endoplasmic reticulum, forming rough ER. The primary function of ribosomes is to translate messenger RNA (mRNA) sequences into polypeptide chains, which then fold into functional proteins. During translation, ribosomes read the sequence of the mRNA in sets of three nucleotides called codons. Each codon corresponds to a specific amino acid, which ribosomes link together in the order specified by the mRNA. This process is vital for cell function and growth, as proteins serve numerous roles, including catalyzing biochemical reactions (as enzymes), providing structural support, and facilitating communication within and between cells. The other choices represent functions that are not associated with ribosomes. Glucose synthesis occurs through processes like photosynthesis and cellular respiration but is not a role of ribosomes. The storage of genetic information is primarily managed by DNA within the nucleus. Lastly, degrading waste materials typically involves organelles like lysosomes rather than ribosomes. Thus, the unique function of ribosomes in protein production is critical for maintaining

4. How many amino acids are considered essential for human health?

- A. Six
- B. Seven
- C. Eight
- D. Nine**

The concept of essential amino acids is crucial to understanding human nutrition. Essential amino acids are those that cannot be synthesized by the body and must be obtained through diet. For human health, there are nine amino acids classified as essential: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine. These amino acids play vital roles in various physiological processes, including protein synthesis, metabolic pathways, and the production of hormones and neurotransmitters. The nine essential amino acids are necessary for proper growth, maintenance, and overall health, especially in children and infants who are still developing. While some dietary sources provide a complete profile of these amino acids—like animal proteins—plant-based sources may lack one or more, making it important for vegetarians and vegans to combine different protein sources to obtain all essential amino acids. Hence, the correct answer, stating that there are nine essential amino acids for human health, underscores the importance of a balanced diet in meeting nutritional needs.

5. Why does crop productivity decline when leaves begin to wilt?

- A. Decrease in root growth
- B. Stomata close, preventing carbon dioxide from entering**
- C. Increase in soil temperature
- D. Reduction in soil nutrients

When leaves begin to wilt, a crucial physiological response occurs in the plant where the stomata, the tiny openings on the leaves, close to conserve water. This closure significantly hampers the plant's ability to intake carbon dioxide from the atmosphere. Carbon dioxide is essential for photosynthesis, the process whereby plants convert light energy into chemical energy, producing sugars and oxygen. Without sufficient carbon dioxide, the rate of photosynthesis declines, resulting in lower production of carbohydrates necessary for growth and overall productivity. Thus, the closing of stomata during wilting directly affects the plant's ability to thrive, leading to a decrease in crop productivity.

6. What are the two classifications of lichens?

- A. Microlichen and Macrolinchen**
- B. Macrolichen and Megalichen
- C. Microphyte and Macrophyte
- D. Algal and Fungal

The correct classification of lichens is based on their symbiotic relationships between fungi and photosynthetic organisms, typically algae or cyanobacteria. Lichens can be broadly categorized into two primary types: those that are dominated by the fungal component (the mycobiont) and those that are distinguished based on the structure and size of the lichen itself. While the terms associated with the answer provided do not accurately represent established lichen classifications, the fundamental understanding of lichens lies in recognizing the two separate components that form the lichen: the fungal partner and the photosynthetic partner. One major aspect of lichen classification is based on their growth forms, such as crustose (crust-like), foliose (leafy), and fruticose (branching). The classifications in the correct answer would recognize the fundamental components that make up lichens, which are more accurately distinguished as algal (the photosynthetic partner) and fungal (the mycobiont) components. This understanding is critical for studying lichen biology, ecology, and the roles they play in their environments.

7. What is the chemical compound name of the Hydroxyl group?

- A. Aldehyde
- B. Alcohol**
- C. Ester
- D. Ketone

The hydroxyl group consists of an oxygen atom bonded to a hydrogen atom ($-OH$). Compounds that contain one or more hydroxyl groups are classified as alcohols. Alcohols can be simple, with just one hydroxyl group attached to a carbon chain, or complex, with multiple hydroxyl groups. This functional group is pivotal in organic chemistry and contributes to the properties of many substances, affecting their reactivity, solubility, and boiling points. In contrast, the other terms mentioned refer to different functional groups. Aldehydes contain a carbonyl group ($-C(=O)-$) at the end of a carbon chain, esters are formed from the reaction of an alcohol and a carboxylic acid, and ketones have a carbonyl group located within the carbon chain. Each of these compounds has distinct properties and reactivity that differ significantly from those of alcohols. Hence, recognizing that the presence of a hydroxyl group directly correlates with the classification of alcohols provides clarity in identifying these compounds.

8. Which part of the flower structure develops into a protective seed coat?

A. The ovule wall

B. The stamen

C. The pistil

D. The petal

The ovule wall develops into a protective seed coat as part of the fertilization and development process in flowering plants. Once the ovule, which contains the female gamete, is fertilized by male pollen, it begins to develop into a seed. The ovule wall, which surrounds and protects the developing fertilized ovule, hardens and transforms into the seed coat. This seed coat plays a crucial role in protecting the seed from desiccation, pathogens, and physical damage while providing a suitable environment for the development of the embryo within. The stamen is the male reproductive part of a flower that produces pollen but does not contribute to seed formation. The pistil, which is the female reproductive structure, plays a role in housing the ovules but does not become the seed coat itself. Petals are primarily involved in attracting pollinators and do not have a direct role in seed development. Therefore, the ovule wall is correctly identified as the structure that evolves into the protective seed coat.

9. What is the final electron acceptor in the electron transport chain?

A. Nitrogen

B. Hydrogen

C. Carbon dioxide

D. Oxygen

In cellular respiration, the electron transport chain (ETC) is a series of protein complexes located in the inner mitochondrial membrane that play a crucial role in aerobic respiration. As electrons are transferred through these complexes, they release energy, which is used to pump protons into the intermembrane space, creating a proton gradient. This gradient drives ATP synthesis when protons flow back into the mitochondrial matrix through ATP synthase. The final electron acceptor in this process is oxygen. At the end of the electron transport chain, oxygen combines with the electrons that have traversed the chain and protons from the mitochondrial matrix to form water. This reaction is vital as it not only allows for the continuation of the electron transport chain by preventing a backlog of electrons but also supports the overall energy production processes of cellular respiration. Without oxygen to accept the electrons, the entire aerobic respiration process would come to a halt, negatively impacting ATP production crucial for cellular functions.

10. When does the Calvin Cycle occur in photosynthesis?

A. When sunlight is absorbed

B. When carbon is fixed from CO₂ to glucose

C. When existing carbon in the cell breaks down from 6 to 3

D. When chlorophyll absorbs light

The Calvin Cycle occurs primarily during the light-independent reactions of photosynthesis, which take place in the stroma of chloroplasts. The proper understanding of when the Calvin Cycle occurs hinges on the processes involved in photosynthesis. The cycle itself is responsible for fixing carbon dioxide (CO₂) into organic molecules, thus synthesizing glucose. Therefore, it is most accurately described by the answer that refers to carbon fixation from CO₂ to glucose. This is a key aspect of the Calvin Cycle, as it incorporates CO₂ into a stable form, ultimately leading to the production of carbohydrates. The incorrect choice involves the process of breaking down carbon or refers to light absorption. While light absorption does initiate the photosynthesis process and is crucial for the light-dependent reactions, it does not directly describe what occurs in the Calvin Cycle itself. The focus of the cycle is on the conversion of fixed carbon into glucose, making the accurate description essential for understanding the cycle's purpose in the photosynthetic process.

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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