

NYSTCE 160 - Biology Practice Exam (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.

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.

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

- 1. Which type of bond is weaker than ionic and covalent bonds, often forming between bases in DNA?**
 - A. Hydrophobic bonds**
 - B. Hydrogen bonds**
 - C. Peptide bonds**
 - D. Van der Waals forces**
- 2. Which of the following best describes the cholesterol levels in individuals with Smith-Lemli-Opitz Syndrome?**
 - A. Excessive cholesterol**
 - B. Normal cholesterol levels**
 - C. Not enough cholesterol**
 - D. Cholesterol levels vary widely**
- 3. Which structure is part of a plant's leaf?**
 - A. Roots**
 - B. Stomata**
 - C. Flowers**
 - D. Seeds**
- 4. In a biological context, what is the primary role of the cerebrum?**
 - A. Balance and coordination**
 - B. Regulation of temperature**
 - C. Conscious thought and action**
 - D. Respiratory control**
- 5. What part of the flower has the primary function of protection?**
 - A. Petal**
 - B. Stamen**
 - C. Sepal**
 - D. Pistil**

- 6. What are the three main categories of joints in the human body?**
- A. Synovial, cartilaginous, fibrous**
 - B. Boney, muscular, fibrous**
 - C. Elastic, rigid, mobile**
 - D. Hinge, ball-and-socket, pivot**
- 7. What type of compound is typically formed when Hydroxyl groups react with alkyl groups?**
- A. Esters**
 - B. Alcohols**
 - C. Aldehydes**
 - D. Ketones**
- 8. Which type of bond holds the water molecules together in a liquid state?**
- A. Covalent bonds**
 - B. Ionic bonds**
 - C. Hydrogen bonds**
 - D. Van der Waals forces**
- 9. If a person has type A blood, what are their possible genotypes?**
- A. AA or AO**
 - B. AA only**
 - C. AO only**
 - D. AB only**
- 10. How does pH affect protein structure?**
- A. It changes the color of the protein**
 - B. It alters the ionic bonds**
 - C. It increases molecular weight**
 - D. It adds additional amino acids**

Answers

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

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Explanations

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1. Which type of bond is weaker than ionic and covalent bonds, often forming between bases in DNA?

- A. Hydrophobic bonds**
- B. Hydrogen bonds**
- C. Peptide bonds**
- D. Van der Waals forces**

Hydrogen bonds are indeed the correct answer in this context because they are relatively weak interactions that occur between molecules or within different parts of a single molecule, such as DNA. In the structure of DNA, hydrogen bonds are responsible for the pairing of nitrogenous bases: adenine pairs with thymine, and cytosine pairs with guanine. Each of these base pairs is held together by hydrogen bonds, which are essential for the stability of the double helix structure without being as strong or as permanent as ionic or covalent bonds. The significance of hydrogen bonds lies in their ability to allow flexibility and dynamic interactions within the DNA molecule, facilitating processes such as DNA replication and transcription without requiring a large amount of energy to break these bonds. This property is crucial for the biological functions of DNA, as it permits the strands to separate easily when needed while maintaining the overall integrity of the molecule. In contrast, while hydrophobic interactions can play a role in the overall structure and stability of biomolecules, they do not specifically form base pairs in nucleic acids. Peptide bonds are strong covalent bonds that link amino acids together in proteins, and Van der Waals forces are weak attractions that occur between all molecules but are not specific to base pairing in DNA. Therefore

2. Which of the following best describes the cholesterol levels in individuals with Smith-Lemli-Opitz Syndrome?

- A. Excessive cholesterol**
- B. Normal cholesterol levels**
- C. Not enough cholesterol**
- D. Cholesterol levels vary widely**

Individuals with Smith-Lemli-Opitz Syndrome (SLOS) typically exhibit low levels of cholesterol due to a metabolic defect in the enzyme responsible for cholesterol synthesis. This condition arises from a mutation in the DHCR7 gene, which encodes the enzyme 7-dehydrocholesterol reductase. As a result of this enzymatic deficiency, there is an accumulation of 7-dehydrocholesterol and a significant deficiency of cholesterol in the body. In SLOS, the insufficient production of cholesterol can lead to various developmental and physical abnormalities, as cholesterol is essential for numerous biological functions, including cell membrane integrity, hormone production, and the development of the nervous system. Therefore, the description that best fits the cholesterol levels in individuals with Smith-Lemli-Opitz Syndrome is the one that indicates not enough cholesterol is present. This deficiency is a hallmark of the syndrome and has significant implications for health and development in affected individuals.

3. Which structure is part of a plant's leaf?

- A. Roots
- B. Stomata**
- C. Flowers
- D. Seeds

The structure that is part of a plant's leaf is stomata. Stomata are small pores located on the surface of the leaves and stems of plants. They play a crucial role in the process of photosynthesis and gas exchange by allowing carbon dioxide to enter the leaf and oxygen to exit. Additionally, stomata help regulate water loss through transpiration, which is essential for maintaining the plant's internal balance and supporting its overall health. Roots, while vital for a plant's growth, are found underground and serve primarily to anchor the plant and absorb water and nutrients from the soil. Flowers are the reproductive structures of plants and are typically not part of the leaf. Seeds are the reproductive units that can give rise to new plants and are primarily formed in flowers or cones, not in leaves. Thus, stomata are specifically associated with leaves and are key to their function in plant biology.

4. In a biological context, what is the primary role of the cerebrum?

- A. Balance and coordination
- B. Regulation of temperature
- C. Conscious thought and action**
- D. Respiratory control

The primary role of the cerebrum in a biological context is indeed to facilitate conscious thought and action. The cerebrum is the largest part of the brain and is responsible for higher brain functions, including reasoning, problem-solving, planning, emotional responses, and sensory perception. It is divided into two hemispheres and further subdivided into lobes that specialize in processing different types of information, such as visual, auditory, and tactile stimuli, as well as integrating this information to make decisions and create responses. This ability to consciously think and act is essential for everything from simple tasks to complex decision-making processes. The functions performed by the cerebrum are what distinguish humans and other mammals in terms of cognitive capabilities. Therefore, it plays a central role in our interactions with the environment, helping us respond logically and effectively to various stimuli. The other functions of the brain, such as balance and coordination, regulation of temperature, and respiratory control, are primarily managed by different regions of the brain, including the cerebellum and the brainstem, which focus on autonomic and motor functions rather than conscious thought.

5. What part of the flower has the primary function of protection?

- A. Petal**
- B. Stamen**
- C. Sepal**
- D. Pistil**

The sepal is the part of the flower that serves the primary function of protection. It is typically found at the base of the flower, encasing and safeguarding the developing bud before it opens. In many species, sepals can also help protect the flower from environmental factors and potential herbivores. While the petals, stamen, and pistil play vital roles in reproduction and attraction (with petals primarily attracting pollinators, stamens producing pollen, and the pistil being involved in ovule production), none of these structures are primarily built for protection in the same way the sepals are. The sepal's protective function is crucial during the early stages of flower development, ensuring the reproductive structures are shielded until they are ready for pollination.

6. What are the three main categories of joints in the human body?

- A. Synovial, cartilaginous, fibrous**
- B. Boney, muscular, fibrous**
- C. Elastic, rigid, mobile**
- D. Hinge, ball-and-socket, pivot**

The three main categories of joints in the human body are correctly identified as synovial, cartilaginous, and fibrous. Synovial joints are characterized by a fluid-filled joint cavity that allows for a wide range of motion. These joints include examples such as knees, elbows, and shoulders, which are crucial for movement and flexibility in various activities. Cartilaginous joints, in contrast, are connected entirely by cartilage, providing some degree of movement while maintaining stability. An example of this type of joint is the intervertebral discs in the spine, which allow for limited motion while absorbing shock. Fibrous joints are fixed joints where the bones are held together by dense connective tissue. These joints do not allow for movement and serve to provide strength and protection, with sutures in the skull being a prime example. This classification of joints is essential for understanding their structure, function, and role in the human body, as each type serves distinct anatomical purposes. The other options do not accurately reflect the recognized categories of joints, leading to less clarity in their biological functions.

7. What type of compound is typically formed when Hydroxyl groups react with alkyl groups?

A. Esters

B. Alcohols

C. Aldehydes

D. Ketones

When hydroxyl groups react with alkyl groups, the result is typically the formation of alcohols. Alcohols are organic compounds characterized by the presence of one or more hydroxyl (-OH) groups attached to a carbon atom. The alkyl group, which consists of one or more carbon atoms bonded to hydrogen atoms, can be attached to the hydroxyl group, thereby giving rise to various types of alcohols depending on the structure and number of carbon atoms present. In the context of organic chemistry, the reaction between a hydroxyl group and an alkyl group often leads to the formation of alcohols through a simple substitution or combination process. When an alkyl group is bonded to the hydroxyl group, it changes the nature of the compound, resulting in an alcohol rather than any of the other compound types listed in the choices. Understanding the structure of alcohols is crucial for recognizing how they differ from other compounds such as esters, aldehydes, or ketones, which involve different functional groups and bonding configurations. Therefore, the presence of the hydroxyl group in conjunction with alkyl groups is a definitive characteristic leading to the formation of alcohols.

8. Which type of bond holds the water molecules together in a liquid state?

A. Covalent bonds

B. Ionic bonds

C. Hydrogen bonds

D. Van der Waals forces

Water molecules are held together in a liquid state primarily by hydrogen bonds, which are a type of attractive force that occurs between the slightly positive hydrogen atoms of one water molecule and the slightly negative oxygen atom of another. This bonding is crucial for many of the unique properties of water, such as its high surface tension, cohesion, and the ability to dissolve a wide range of substances. In the structure of water, each molecule is composed of two hydrogen atoms covalently bonded to a single oxygen atom. While the covalent bonds within each water molecule are strong and hold the atoms together, it is the hydrogen bonds that allow water molecules to associate with each other in the liquid state. These hydrogen bonds are relatively weak compared to covalent bonds, but they are significant in number and contribute to the overall structure and behavior of liquid water. Understanding hydrogen bonding is key to grasping why water behaves the way it does as a liquid, influencing not only its physical properties but also its role in biological systems, making it essential for life.

9. If a person has type A blood, what are their possible genotypes?

A. AA or AO

B. AA only

C. AO only

D. AB only

A person with type A blood can have two possible genotypes: AA or AO. This is because blood type is determined by the presence of specific antigens on the surface of red blood cells, which are influenced by two alleles inherited from each parent. The genotype AA indicates that both alleles are of the A type, resulting in the expression of the A antigen on the red blood cells. The genotype AO represents a combination of one A allele and one O allele. The O allele does not produce any antigens and is considered recessive. In this case, the presence of the A allele is sufficient for the blood type to express as type A, even with an O allele present. Thus, individuals can have either homozygous (AA) or heterozygous (AO) combinations for type A blood, which is why the answer is the first option. This understanding of blood type genetics is foundational in fields such as transfusion medicine and genetics.

10. How does pH affect protein structure?

A. It changes the color of the protein

B. It alters the ionic bonds

C. It increases molecular weight

D. It adds additional amino acids

The correct answer highlights the role of pH in altering ionic bonds, which are critical to maintaining the structure of proteins. Proteins are made up of chains of amino acids, which have side chains that can be positively charged, negatively charged, or neutral, depending on the pH of the environment. When the pH of the solution changes, it can affect the ionization of these side chains. For example, at a low pH (acidic), more carboxyl groups (-COOH) in the amino acids are protonated and carry a neutral charge, which can disrupt ionic interactions that stabilize protein structure. Conversely, at a high pH (basic), amino groups (-NH₂) can become deprotonated, affecting their positive charge. These shifts in ionization lead to changes in ionic bonds within the protein, which can result in denaturation or alterations in biological function. Thus, understanding that pH affects the ionic bonds provides insight into protein folding, stability, and functionality, which is crucial in biochemical processes and applications in various fields. Other choices, such as changes in color, increased molecular weight, or the addition of amino acids, do not accurately describe the direct effects of pH on the structural integrity of proteins.

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://nystce160.examzify.com>

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