

# HOSA BIOTECHNOLOGY PRACTICE TEST (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. How does a graduated pipette compare in accuracy to a volumetric pipette?**
  - A. More accurate than a volumetric pipette
  - B. Equally accurate as a volumetric pipette
  - C. Less accurate than a volumetric pipette
  - D. Not measurable
- 2. What are chromosomes primarily made of?**
  - A. RNA and lipids
  - B. DNA and protein molecules
  - C. Carbohydrates and sugars
  - D. Enzymes and hormones
- 3. What fraction of a liter does a microliter (uL) represent?**
  - A. One thousandth
  - B. One millionth
  - C. One hundredth
  - D. One tenth
- 4. Which groups are included in the classification of living things?**
  - A. Fungi and viruses
  - B. Plants and animals
  - C. Bacteria and archaea
  - D. All of the above
- 5. Where are proteins manufactured within a cell?**
  - A. Golgi apparatus
  - B. Mitochondria
  - C. Nucleus
  - D. Ribosome
- 6. Which laboratory tool is primarily used for combining liquids and stirring materials?**
  - A. Test tube rack
  - B. Stirring rod
  - C. Transfer pipet
  - D. Centrifuge

**7. What is a key requirement for lab notebooks in the United States?**

- A. They must be computer-based
- B. They need to have page numbers
- C. They can be kept by anyone in the lab
- D. They should only detail theoretical procedures

**8. What is the purpose of a laminar flow hood in a lab?**

- A. To maintain humidity for sensitive experiments
- B. To provide a sterile environment for aseptic production
- C. To measure small volumes of liquids accurately
- D. To extract samples from volatile solutions

**9. What is the main advantage of using micropipettes over traditional pipettes?**

- A. They are cheaper
- B. They are more versatile
- C. They measure very small volumes accurately
- D. They are easier to clean

**10. What is the primary use of a micropipet tip?**

- A. To protect the micropipet from contamination
- B. To enhance optical quality
- C. To facilitate easier dispensing of liquids
- D. To hold samples at a controlled temperature



## **Answers**

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

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## **Explanations**

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### 1. How does a graduated pipette compare in accuracy to a volumetric pipette?

- A. More accurate than a volumetric pipette
- B. Equally accurate as a volumetric pipette
- C. Less accurate than a volumetric pipette**
- D. Not measurable

A graduated pipette is indeed less accurate than a volumetric pipette. The primary function of a volumetric pipette is to measure a specific volume of liquid with a high degree of precision. This is achieved because volumetric pipettes are designed to hold a fixed volume and have a wider cross-section, allowing for more accurate meniscus reading. In contrast, graduated pipettes, while versatile and able to measure various volumes, are marked with a scale that may introduce some degree of uncertainty due to the multiple graduation marks and the need for careful reading. The potential for parallax error when reading measurements can also reduce accuracy. Thus, when precision is critical, a volumetric pipette is preferred for applications requiring exact measurements, making it superior in accuracy compared to a graduated pipette. This understanding is key in laboratory settings where accurate measurement is essential for experimental integrity and reproducibility.

### 2. What are chromosomes primarily made of?

- A. RNA and lipids
- B. DNA and protein molecules**
- C. Carbohydrates and sugars
- D. Enzymes and hormones

Chromosomes are primarily made of DNA and protein molecules, which form a complex known as chromatin. DNA carries the genetic information essential for the growth, development, and functioning of an organism. The proteins, primarily histones, play critical roles in packaging and organizing this DNA to fit within the nucleus of a cell. These proteins help to condense DNA into a more compact structure, allowing for the orderly segregation of chromosomes during cell division. The presence of proteins is fundamental in regulating gene expression and ensuring that the DNA is properly replicated and repaired. This combination of DNA and proteins is what allows chromosomes to maintain their structural integrity and perform their necessary functions during cell division and throughout the cell cycle. The other options do not accurately reflect the composition or function relevant to chromosomes.

### 3. What fraction of a liter does a microliter (uL) represent?

- A. One thousandth
- B. One millionth**
- C. One hundredth
- D. One tenth

A microliter (uL) represents one millionth of a liter. This is a standard measurement in the metric system where the prefix "micro-" denotes a factor of one millionth ( $10^{-6}$ ). In practical terms, when you convert liters to microliters, you multiply the number of liters by 1,000,000 since there are 1,000,000 microliters in one liter. Understanding this relationship is crucial in fields like biology and chemistry where precise measurements of liquids are often needed, especially in scenarios such as dilutions, pipetting, and sample preparations. In contrast, the other fractions provided do not correspond to the definition of a microliter; for example, one thousandth refers to a milliliter, one hundredth to centiliters, and one tenth to deciliters.

#### 4. Which groups are included in the classification of living things?

- A. Fungi and viruses
- B. Plants and animals
- C. Bacteria and archaea
- D. All of the above**

*The classification of living things, also known as taxonomy, encompasses a wide variety of organisms across multiple domains and kingdoms. Selecting "All of the above" is accurate because it recognizes the diversity of life on Earth by including numerous groups within its framework. Fungi, viruses, plants, animals, bacteria, and archaea all represent distinct categories of living organisms, each with unique characteristics that define them. For instance, fungi are a separate kingdom that includes organisms such as molds and yeasts, which play critical roles in decomposition and nutrient cycling. Viruses, while not classified as living organisms in the traditional sense because they cannot reproduce independently, are still an essential aspect of biological study due to their impact on living cells and ecosystems. Plants and animals are part of the broader categorization within the domain Eukaryota, which encompasses organisms that have cells with a nucleus. These groups are fundamental to the study of biology and ecology, contributing to the understanding of life processes. Bacteria and archaea, on the other hand, fall under the domain Prokaryota, consisting of unicellular organisms that lack a nucleus. These groups are crucial for various biological functions, including nutrient cycling, and they demonstrate significant metabolic diversity. By selecting "All of the above,"*

#### 5. Where are proteins manufactured within a cell?

- A. Golgi apparatus
- B. Mitochondria
- C. Nucleus
- D. Ribosome**

*Proteins are primarily manufactured within a cell at the ribosomes. Ribosomes are complex molecular machines made up of ribosomal RNA and proteins that facilitate the translation of messenger RNA (mRNA) into a polypeptide chain, which then folds into a functional protein. This process occurs in the cytoplasm of the cell, either freely floating or attached to the endoplasmic reticulum, which is known as rough ER when ribosomes are bound to it. The other cellular components mentioned have distinct functions. The Golgi apparatus is involved in modifying, sorting, and packaging proteins for secretion or delivery to other organelles but does not synthesize them. Mitochondria are the powerhouse of the cell and generate energy through cellular respiration, while the nucleus houses the cell's genetic material and is where transcription occurs, not the actual synthesis of proteins. Hence, the ribosome is accurately identified as the site of protein synthesis in the cell.*

**6. Which laboratory tool is primarily used for combining liquids and stirring materials?**

- A. Test tube rack
- B. Stirring rod**
- C. Transfer pipet
- D. Centrifuge

*The stirring rod is specifically designed to combine liquids and stir materials in laboratory settings. It is typically made of glass or plastic and serves the purpose of mixing substances effectively without introducing contaminants or reacting with the materials being stirred. By facilitating uniform mixing, a stirring rod is essential for experiments requiring homogenization of liquid solutions or suspensions. In contrast, other tools have distinct primary functions. A test tube rack is primarily used to hold test tubes in an upright position, providing organization but not functionality for mixing. A transfer pipet is designed for transferring small volumes of liquids but does not combine them actively. A centrifuge, on the other hand, is used to separate components in a mixture based on density, which does not involve stirring but rather spinning the samples at high speeds to achieve separation. Thus, the stirring rod's role in mixing makes it the most appropriate choice for the question asked.*

**7. What is a key requirement for lab notebooks in the United States?**

- A. They must be computer-based
- B. They need to have page numbers**
- C. They can be kept by anyone in the lab
- D. They should only detail theoretical procedures

*A key requirement for lab notebooks in the United States is that they need to have page numbers. This practice is essential for maintaining an organized and retrievable record of experimental work. Page numbering ensures that entries are sequentially arranged, making it easier to track the progression of experiments, data collection, and any modifications made along the way. This organization is particularly important for the integrity of the research and for any legal or patent-related documentation, where the tracing of developments and innovations is crucial. The structured format provided by page numbers can help verify that the notebook accurately reflects the timeline of scientific inquiry and the evolving nature of experiments, which is vital for both academic and professional credibility in research.*

## 8. What is the purpose of a laminar flow hood in a lab?

- A. To maintain humidity for sensitive experiments
- B. To provide a sterile environment for aseptic production**
- C. To measure small volumes of liquids accurately
- D. To extract samples from volatile solutions

*The purpose of a laminar flow hood is to provide a sterile environment for aseptic production. This is achieved through the use of a continuous flow of filtered air that helps protect the work area and the materials being handled from contamination. The flow hood is designed to ensure that airborne contaminants are minimized, making it an essential piece of equipment when working with biological samples, preparing cultures, or conducting experiments that require a sterile environment. The laminar flow hood directs air through HEPA filters that trap particles, dust, and microorganisms, creating a clean air flow that protects both the operator and the samples from contamination. This sterile environment is crucial in applications such as cell culture, where even the smallest contamination can compromise the integrity of the work. In contrast, other options do not capture the primary function of the laminar flow hood. For example, while maintaining humidity might be relevant for certain experiments, it is not the main function of a laminar flow hood. Similarly, accurately measuring small volumes of liquids is typically accomplished with pipettes or microliter syringes, and extracting samples from volatile solutions relates more to different types of laboratory equipment designed for handling volatile substances. Therefore, the correct understanding of the function of the laminar flow hood underscores its importance*

## 9. What is the main advantage of using micropipettes over traditional pipettes?

- A. They are cheaper
- B. They are more versatile
- C. They measure very small volumes accurately**
- D. They are easier to clean

*The main advantage of using micropipettes over traditional pipettes lies in their ability to measure very small volumes accurately. Micropipettes are designed to handle minute quantities of liquids, often ranging from 0.1 microliters to 1,000 microliters (1 milliliter). This precision is crucial in many biotechnology applications, where the accuracy of liquid handling can significantly impact experimental outcomes. Micropipettes utilize a piston-driven mechanism, allowing for precise volume selection and consistent delivery of liquids. This level of accuracy is generally unattainable with traditional pipettes, which are typically used for larger volumes and may not provide the necessary precision for micro-scale tasks. The ability to accurately dispense small volumes is essential in fields such as molecular biology, genetics, and biochemistry, where precise measurements play a critical role in experimental success and reproducibility. While factors such as cost, versatility, and ease of cleaning might also be relevant when choosing between pipettes, they do not capture the primary technical advantage that makes micropipettes indispensable in modern laboratory settings.*

**10. What is the primary use of a micropipet tip?**

- A. To protect the micropipet from contamination**
- B. To enhance optical quality
- C. To facilitate easier dispensing of liquids
- D. To hold samples at a controlled temperature

*The primary use of a micropipet tip is to protect the micropipet from contamination. When utilizing a micropipet for liquid handling in a laboratory setting, the tip acts as a barrier between the liquid being pipetted and the micropipet itself. This is particularly important in maintaining the integrity of samples and preventing cross-contamination between different substances. By using disposable tips, any potentially harmful or reactive liquid is kept away from the main unit of the micropipet, ensuring that subsequent samples remain uncontaminated and that the accuracy of measurements is upheld. Other options mention functionalities such as enhancing optical quality, facilitating easier dispensing of liquids, or controlling temperature. While tips can help with dispensing due to their design, it is primarily their role in contamination prevention that is most critical in laboratory practices, making the correct choice revolve around protecting the micropipet and samples.*

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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](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

<https://hosabiotechnology.examzify.com>

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

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