

PIMA JTED BIOSCIENCE PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	16

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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. Which document is essential for understanding how to safely use chemicals?**
 - A. Standard Operating Procedure
 - B. Personal Protective Equipment
 - C. Safety Data Sheet
 - D. Occupational Safety Procedure

- 2. In statistics, which term best describes a data set with very closely clustered values?**
 - A. High standard deviation
 - B. Low standard deviation
 - C. High mode
 - D. High range

- 3. What is the Sanger method of sequencing known for?**
 - A. Sequencing RNA only
 - B. Using fluorescent tags on DNA fragments
 - C. Chain-terminating dideoxynucleotides to create DNA fragments
 - D. A high-throughput sequencing technique

- 4. What are nucleic acids primarily composed of?**
 - A. Carbohydrates and proteins
 - B. Nucleotide subunits, including phosphate groups and sugars
 - C. Amino acids and lipids
 - D. Cellular membranes and polypeptides

- 5. What does an assay aimed at protein quantification help determine?**
 - A. The specific amino acid sequence
 - B. The concentration of proteins in a sample
 - C. The three-dimensional structure of proteins
 - D. The source of proteins

- 6. Which device is essential for precise mass measurements in the laboratory?**
- A. Graduated cylinder
 - B. Analytical balance
 - C. Beaker
 - D. Test tube
- 7. What is defined as the factor of an experiment that is altered as a result of the independent variable?**
- A. Constant variable
 - B. Independent variable
 - C. Dependent variable
 - D. Control variable
- 8. What is the purpose of the BLAST tool?**
- A. To conduct manual annotations of genomic data
 - B. To compare a nucleotide or protein sequence to a database
 - C. To analyze protein structure using molecular dynamics
 - D. To sequence entire genomes from RNA samples
- 9. What does the reverse primer do during PCR?**
- A. Binds to the stop codon of the complementary strand
 - B. Binds to the start codon of the original template strand
 - C. Assists in denaturing the DNA
 - D. Leads to the synthesis of RNA from the DNA template
- 10. What is a literature review in research?**
- A. An original research study
 - B. A secondary source that summarizes current knowledge on a topic
 - C. An experimental procedure
 - D. A personal reflection of the researcher

Answers

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

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Explanations

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1. Which document is essential for understanding how to safely use chemicals?

- A. Standard Operating Procedure
- B. Personal Protective Equipment
- C. Safety Data Sheet**
- D. Occupational Safety Procedure

The Safety Data Sheet (SDS) is essential for understanding how to safely use chemicals because it provides detailed information on the properties, hazards, and safe handling practices for specific substances. Each SDS includes sectioned information that covers aspects such as the chemical's characteristics, potential health effects, safe storage guidelines, emergency response measures, and information on protective equipment needed when handling the chemical. Accessing and understanding the SDS is crucial for anyone working with hazardous materials, as it helps ensure compliance with safety regulations and promotes a safe working environment. Users can refer to the SDS to make informed decisions about how to handle, store, and respond to emergencies involving the chemical, addressing concerns that affect both individual safety and regulatory compliance in the laboratory or workplace.

2. In statistics, which term best describes a data set with very closely clustered values?

- A. High standard deviation
- B. Low standard deviation**
- C. High mode
- D. High range

A data set with very closely clustered values is best described by having a low standard deviation. The standard deviation is a statistical measure that quantifies the amount of variation or dispersion in a set of values. When the values in a data set are closely clustered together, it indicates that most of the data points are near the mean, resulting in a low standard deviation. This suggests that there is little variability among the values. On the other hand, options like high standard deviation would indicate a wide spread of values, meaning the data points are diverse and not closely clustered. The mode, which refers to the most frequently occurring value in the data set, does not provide information about how close the values are to each other. Similarly, the range, defined as the difference between the maximum and minimum values, relates to the extent of values in the set rather than how closely they are grouped together. Therefore, low standard deviation is the most accurate description of a data set with very closely clustered values.

3. What is the Sanger method of sequencing known for?

- A. Sequencing RNA only
- B. Using fluorescent tags on DNA fragments
- C. Chain-terminating dideoxynucleotides to create DNA fragments**
- D. A high-throughput sequencing technique

The Sanger method of sequencing, also known as chain-termination sequencing, is renowned for its use of dideoxynucleotides to create DNA fragments of varying lengths. In this process, dideoxynucleotides are incorporated into the growing DNA chain during replication, which causes the chain to terminate because these nucleotides lack a 3' hydroxyl group necessary for further elongation. As a result, this generates a set of DNA fragments that can be analyzed to determine the sequence of the original DNA template. Studying the fragments produced during this method allows researchers to read the original sequence by employing techniques such as gel electrophoresis or capillary electrophoresis. This method has been foundational in the field of genetics and has paved the way for sequencing technologies used today, albeit with less emphasis on high-throughput techniques compared to more recent advancements. The use of dideoxynucleotides is what makes this method distinctive and is why it is primarily recognized for this notable characteristic.

4. What are nucleic acids primarily composed of?

- A. Carbohydrates and proteins
- B. Nucleotide subunits, including phosphate groups and sugars**
- C. Amino acids and lipids
- D. Cellular membranes and polypeptides

Nucleic acids, which include DNA and RNA, are primarily composed of nucleotide subunits. Each nucleotide is made up of three components: a phosphate group, a five-carbon sugar (such as ribose in RNA or deoxyribose in DNA), and one of several nitrogenous bases (adenine, thymine, cytosine, guanine, or uracil). This structure is essential because it allows nucleic acids to carry genetic information and participate in processes such as protein synthesis. The composition of nucleic acids is fundamental to their function in biology, enabling them to store, transmit, and express genetic information. The specific arrangement of the nitrogenous bases, along with the sugar and phosphate backbone, forms the unique sequences found in DNA and RNA, which are crucial for directing cellular activities and inheritance. While other macromolecules such as carbohydrates and proteins serve important roles in cellular function and structure, they are distinct in both composition and function from nucleic acids.

5. What does an assay aimed at protein quantification help determine?

- A. The specific amino acid sequence
- B. The concentration of proteins in a sample**
- C. The three-dimensional structure of proteins
- D. The source of proteins

An assay aimed at protein quantification is designed to measure the concentration of proteins within a given sample. This is a fundamental technique used in various bioscience applications, as knowing the amount of protein present is crucial for understanding biological processes, conducting experiments, and analyzing the properties of proteins. By quantifying protein levels, researchers can assess how proteins function, how they are produced, and how they interact with other biomolecules under different conditions. Determining protein concentration can involve several methods, such as spectrophotometry, colorimetric assays, and chromatography, which provide specific measurements of protein content. This information is vital for experiments that require precise amounts of proteins, such as enzyme assays, protein interactions studies, or therapeutic protein development, where knowing the concentration ensures reproducibility and accuracy in results.

6. Which device is essential for precise mass measurements in the laboratory?

- A. Graduated cylinder
- B. Analytical balance**
- C. Beaker
- D. Test tube

An analytical balance is essential for precise mass measurements in the laboratory because it is designed to measure small masses with a high degree of accuracy and precision, often down to the milligram or even microgram level. Analytical balances are equipped with sensitive electronic components that can detect minute changes in mass and typically include features like draft shields to reduce the effect of air currents on measurements. This level of precision is crucial in scientific experiments where the exact amount of a substance can significantly impact the results. In contrast, a graduated cylinder is primarily used for measuring liquid volumes rather than mass, while a beaker is more suited for holding and mixing substances without precise volume measurement. Test tubes are used for holding small quantities of liquids for experiments but do not provide the necessary accuracy for mass measurements. Thus, when it comes to obtaining precise mass data, the analytical balance is the instrument of choice.

7. What is defined as the factor of an experiment that is altered as a result of the independent variable?

- A. Constant variable
- B. Independent variable
- C. Dependent variable**
- D. Control variable

The concept being described relates to the role of different types of variables in an experiment. The dependent variable is specifically defined as the factor that is measured or observed in response to changes made to the independent variable. When researchers manipulate the independent variable, they observe how it affects the dependent variable. This relationship allows scientists to understand cause-and-effect dynamics in their experiments. In contrast, the independent variable is the one that is intentionally changed or controlled to test its effects on the dependent variable. Constant variables refer to elements that are kept the same throughout an experiment to ensure that the test is fair, while control variables might refer to aspects that are not being tested but could influence the results. Therefore, the correct identification of the dependent variable is crucial for understanding the outcomes of any scientific investigation.

8. What is the purpose of the BLAST tool?

- A. To conduct manual annotations of genomic data
- B. To compare a nucleotide or protein sequence to a database**
- C. To analyze protein structure using molecular dynamics
- D. To sequence entire genomes from RNA samples

The BLAST (Basic Local Alignment Search Tool) is primarily utilized to compare a nucleotide or protein sequence to a database of known sequences. When a user inputs a sequence into BLAST, the tool searches through a vast repository of genetic data to find regions of similarity or matches, enabling researchers to identify homologous sequences in other organisms or to find variants in their own sequence data. This function is critical in many areas of bioinformatics and molecular biology, including gene identification, functional annotation of genes, and evolutionary studies. The other options describe processes that are not what BLAST is designed for; for example, manual annotations involve human interpretation of data rather than automated comparisons. Analyzing protein structures often requires different tools focused on computational modeling rather than sequence alignment, and sequencing genomes would more likely utilize technologies and methods specific to sequencing, rather than a comparison tool like BLAST. Thus, understanding that BLAST facilitates the comparison of sequences helps clarify its essential role in bioinformatics.

9. What does the reverse primer do during PCR?

- A. Binds to the stop codon of the complementary strand**
- B. Binds to the start codon of the original template strand
- C. Assists in denaturing the DNA
- D. Leads to the synthesis of RNA from the DNA template

The reverse primer plays a crucial role in the PCR (Polymerase Chain Reaction) process by providing a starting point for DNA synthesis. It binds to the complementary strand of the DNA template, specifically at a region adjacent to the target sequence. This binding allows the DNA polymerase enzyme to extend the primer and synthesize new DNA. When focusing on the function of the reverse primer, it's important to note that it does not interact with the stop codon of the template strand. Instead, it is complementary to the sequence that follows the target area on the opposite strand. This means it facilitates the amplification of the desired DNA segment by enabling the polymerase to build a strand in the 5' to 3' direction, effectively leading to the duplication of the target DNA region. In this context, other options do not accurately describe the role of the reverse primer. The primer does not bind to a start codon, does not assist in denaturing DNA, and does not lead to RNA synthesis, as its primary purpose is to initiate DNA amplification during PCR. Overall, the correct choice highlights the fundamental nature of how reverse primers function in the replication process being utilized in molecular biology.

10. What is a literature review in research?

- A. An original research study
- B. A secondary source that summarizes current knowledge on a topic**
- C. An experimental procedure
- D. A personal reflection of the researcher

A literature review is a comprehensive examination and summary of existing research on a specific topic, making it a crucial component of the research process. It serves to collate and analyze published works related to a particular subject area, thereby establishing a foundation for further exploration or investigation. In this context, labeling a literature review as a secondary source is accurate because it does not present new experimental data or original findings; instead, it synthesizes and discusses the findings of previously published studies. By doing so, it provides an overview of what is already known, highlights gaps in knowledge, and may identify areas for further research. This is essential for contextualizing new research questions or hypotheses based on an understanding of the existing body of knowledge. In contrast, the other options represent different aspects of research or personal expression, which do not align with the definition and purpose of a literature review. An original research study presents new findings, experimental procedures involve hands-on testing and observation, and a personal reflection would pertain to the researcher's subjective thoughts rather than an objective synthesis of academic literature.

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://pimajtedbioscience.examzify.com>

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

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