T level Science Core B Biology Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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!

Questions

1. Which of the following is NOT an organelle found in animal and plant cells?

A. Centriole

B. Cell membrane

C. Chloroplast

D. Lysosome

2. How do you convert millimeters to micrometers?

A. Multiply by 100

B. Divide by 10

C. Multiply by 1000

D. Divide by 1000

3. What is a common characteristic of all pathogens?

A. They provide essential nutrients to the host.

B. They can survive without a host.

C. They cause some form of harm to the host.

D. They reproduce outside the host.

4. What component of nucleotides varies among different types of nucleic acids?

A. Phosphate group

B. Sugar

C. Organic base

D. All of the above

5. What does the term "induced fit" refer to in enzymatic activity?

A. The enzyme remains unchanged after the reaction

B. The substrate changes shape after binding

C. The enzyme changes shape to better fit the substrate

D. The enzyme requires a cofactor to change shape

6. How do white blood cells effectively reach sites of infection?

A. By avoiding blood vessels

B. By squeezing through small gaps

C. By forming new blood vessels

D. By traveling in clusters

7. What is the first stage in semi-conservative replication of DNA?

A. Formation of two chains

B. Breakage of hydrogen bonds

C. Progressive unwinding

D. Involvement of DNA polymerase

8. What are nucleic acids primarily composed of?

A. Amino acids

B. Nucleotides

C. Fatty acids

D. Glycerol

9. What is defined as a spontaneous change in a DNA sequence?

A. A mutation

B. A gene expression

C. A chromosomal rearrangement

D. A replication error

10. What structures regulate the entrance and exit of materials in a cell?

A. Cell wall

B. Cytoplasm

C. Cell membrane

D. Nucleus

Answers

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

Explanations

1. Which of the following is NOT an organelle found in animal and plant cells?

A. Centriole

B. Cell membrane

C. Chloroplast

D. Lysosome

Chloroplasts are the organelles responsible for photosynthesis in plant cells, allowing them to convert light energy into chemical energy in the form of glucose. Since chloroplasts contain chlorophyll, they are instrumental in capturing sunlight and are specifically found in plants and some protists, but not in animal cells. In contrast, centrioles, the cell membrane, and lysosomes are found in both animal and plant cells. Centrioles are involved in cell division and organizing microtubules, the cell membrane acts as a protective barrier and regulates the movement of substances into and out of the cell, and lysosomes contain digestive enzymes for breaking down waste materials. Therefore, chloroplasts are distinct to plant cells, making them the correct response to the question regarding which structure is not found in both types of cells.

2. How do you convert millimeters to micrometers?

A. Multiply by 100

B. Divide by 10

C. Multiply by 1000

D. Divide by 1000

To convert millimeters to micrometers, you need to understand the relationship between these two units of measurement. One millimeter is equal to 1,000 micrometers (µm). Therefore, to convert millimeters into micrometers, you multiply the number of millimeters by 1,000. For example, if you have 1 millimeter and you want to convert it to micrometers, you would perform the calculation: $1\ mm \times 1{,}000\ \mu m/mm = 1{,}000\ \mu m$. This conversion is fundamental in fields such as biology and materials science, where precise measurements at small scales are often required. Other options suggest different mathematical operations that do not accurately reflect the conversion factor between millimeters and micrometers. Only the multiplication by 1,000 correctly reflects how many micrometers are contained in a millimeter.

3. What is a common characteristic of all pathogens?

A. They provide essential nutrients to the host.

B. They can survive without a host.

C. They cause some form of harm to the host.

D. They reproduce outside the host.

All pathogens share the characteristic of causing some form of harm to their host. This harm can manifest in various ways, such as through the destruction of host tissues, triggering an immune response that leads to symptoms of illness, or producing toxins that disrupt normal cellular functions. Whether they are bacteria, viruses, fungi, or parasites, their basic role involves exploiting the host's resources for survival and reproduction, often at the expense of the host's health. While some options may touch on aspects related to pathogens, they do not encompass a fundamental trait shared by all. For instance, not all pathogens can survive without a host, as many are entirely dependent on their host's environment to thrive. Additionally, not all pathogens reproduce outside their hosts; many, such as certain viruses, require specific host cells for their reproductive processes. Therefore, the ability to cause harm is the definitive characteristic that unites all pathogens in their interactions with their hosts.

4. What component of nucleotides varies among different types of nucleic acids?

A. Phosphate group

B. Sugar

C. Organic base

D. All of the above

The correct choice highlights that the component of nucleotides that varies among different types of nucleic acids is the organic base. Nucleotides are the building blocks of nucleic acids, which include DNA and RNA. In DNA, the organic bases can be adenine, thymine, cytosine, or guanine. In contrast, RNA contains adenine, uracil, cytosine, and guanine. This distinction in the organic base is significant as it affects the structure and function of the nucleic acids. The specific sequence of these bases encodes genetic information, influencing everything from protein synthesis to the regulation of various biological processes. While the phosphate group and sugar component remain consistent within nucleic acids, varying only slightly between RNA and DNA (the sugar in DNA is deoxyribose, while in RNA it is ribose), it is the organic base that provides the critical differences that define the functionality and uniqueness of each nucleic acid type. Thus, the variability in organic bases is fundamental to the diverse roles that nucleic acids play in the cell.

5. What does the term "induced fit" refer to in enzymatic activity?

A. The enzyme remains unchanged after the reaction

B. The substrate changes shape after binding

C. The enzyme changes shape to better fit the substrate

D. The enzyme requires a cofactor to change shape

The term "induced fit" refers to the dynamic interaction that occurs between an enzyme and its substrate. When a substrate approaches an enzyme, the initial interaction is not perfectly complementary; rather, the enzyme undergoes a conformational change upon binding to the substrate. This change allows the enzyme to better accommodate the substrate, leading to a more precise fit that enhances the efficiency of the catalysis process. This concept emphasizes that the binding is not merely a static lock-and-key mechanism, but rather an adaptable one, where the enzyme adjusts its shape in response to the substrate. This adaptability is crucial for the enzyme's catalytic activity because it facilitates the transition state needed for the chemical reaction to occur, ultimately leading to the conversion of substrate into product.

6. How do white blood cells effectively reach sites of infection?

A. By avoiding blood vessels

B. By squeezing through small gaps

C. By forming new blood vessels

D. By traveling in clusters

White blood cells, or leukocytes, play a crucial role in the immune system by identifying and combating infections. When there is an infection, these cells are signaled to move from the bloodstream to the affected tissues. They achieve this primarily by squeezing through the walls of blood vessels. This process, known as diapedesis, allows them to navigate through the endothelial cells that line the vessels. The ability to pass through these small gaps is essential for white blood cells to reach areas where they are needed to fight off pathogens. As they exit the bloodstream, they can then move toward the site of infection, following chemical signals released by infected or damaged tissues. This mechanism is vital to the inflammatory response, enabling white blood cells to quickly respond to infections and initiate healing processes. The other choices do not accurately describe how white blood cells reach infection sites; for example, avoiding blood vessels would prevent them from accessing the necessary locations, and forming new blood vessels is a separate biological process unrelated to immediate immune response.

7. What is the first stage in semi-conservative replication of DNA?

A. Formation of two chains

B. Breakage of hydrogen bonds

C. Progressive unwinding

D. Involvement of DNA polymerase

In semi-conservative replication of DNA, the first stage involves the unwinding of the double helix structure of the DNA molecule. This process is critical as it allows for each strand of the DNA to serve as a template for the synthesis of a new complementary strand. During this unwinding, the hydrogen bonds that hold the two strands together are disrupted, leading to the separation of the strands. By progressing with the unwinding, the replication machinery can access the bases on each strand, which is essential for the next steps in the replication process. This stage is not just about separating the strands but also about preparing the DNA for effective replication, ensuring that each template strand is exposed and ready for the addition of complementary nucleotides.

8. What are nucleic acids primarily composed of?

A. Amino acids

B. Nucleotides

C. Fatty acids

D. Glycerol

Nucleic acids, such as DNA and RNA, are primarily composed of nucleotides. Nucleotides are the building blocks of nucleic acids, consisting of three components: a nitrogenous base, a sugar (ribose in RNA and deoxyribose in DNA), and a phosphate group. These nucleotides link together through covalent bonds to form long chains or polymers that make up the structure of nucleic acids, facilitating the storage and transmission of genetic information. The other options, while important biological molecules, do not relate to the composition of nucleic acids. Amino acids are the building blocks of proteins, fatty acids are components of lipids, and glycerol is part of triglycerides. Understanding this distinction is essential in biology, as it highlights the unique roles and structures of different macromolecules within living organisms.

9. What is defined as a spontaneous change in a DNA sequence?

A. A mutation

B. A gene expression

C. A chromosomal rearrangement

D. A replication error

A mutation is defined as a spontaneous change in a DNA sequence. Mutations can occur due to various factors such as environmental influences, replication errors, or simply as a natural part of cellular processes. They can involve changes to single nucleotides—like substitutions, insertions, or deletions—or larger-scale alterations affecting larger segments of DNA. These changes can affect the function of genes, leading to variations in traits among organisms. The other options reference different biological processes: gene expression involves the process by which information from a gene is used to synthesize functional gene products like proteins, chromosomal rearrangement refers to larger-scale structural changes in chromosomes that can impact gene function or inheritance, and replication errors are mistakes that occur during DNA replication, which can lead to mutations but do not define all mutations.

10. What structures regulate the entrance and exit of materials in a cell?

A. Cell wall

B. Cytoplasm

C. Cell membrane

D. Nucleus

The cell membrane is the structure that regulates the entrance and exit of materials in a cell. It is composed of a phospholipid bilayer with embedded proteins, which create a selective barrier. This selectivity allows the membrane to control what substances can pass into or out of the cell, maintaining homeostasis and enabling the cell to respond to environmental changes. The cell membrane's ability to facilitate or restrict the movement of ions, nutrients, and waste products is crucial for various cellular processes. For instance, certain proteins in the membrane act as channels or transporters that facilitate the movement of specific molecules, while others may serve as receptors to transmit signals within the cell. In contrast, the cell wall, primarily found in plant cells, fungi, and certain bacteria, provides structural support and protection but does not actively control material exchange in the same way that the cell membrane does. The cytoplasm is the jelly-like substance within the cell where organelles are found and does not regulate movement in and out of the cell. The nucleus, which houses genetic material, controls cellular activities including gene expression, but it does not directly manage the passage of materials across the cell boundary.

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://tlevelsciencecorebbio.examzify.com

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