

T level Science Core B Biology Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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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 component of DNA provides the basis for genetic diversity?**
 - A. The order of nucleotides**
 - B. The type of sugar**
 - C. The number of phosphate groups**
 - D. The structural proteins**

- 2. Which attribute of enzymes is primarily determined by their tertiary structure?**
 - A. Size and weight**
 - B. Shape of active site**
 - C. Electrical charge**
 - D. Solubility in water**

- 3. What is the purpose of complementary base pairing in DNA structure?**
 - A. To allow for mutations**
 - B. To stabilize the double helix**
 - C. To enhance replication speed**
 - D. To facilitate protein synthesis**

- 4. What role do the side chains (R groups) of amino acids play?**
 - A. They are the same for all amino acids**
 - B. They determine the specific properties of each amino acid**
 - C. They make up the backbone of proteins**
 - D. They are not involved in protein structure**

- 5. What role do DNA and RNA play in genetic information handling?**
 - A. DNA stores genetic information, RNA synthesizes proteins**
 - B. DNA transfers genetic information, RNA stores data**
 - C. DNA and RNA both store genetic information**
 - D. RNA holds genetic information, DNA transfers it to cells**

- 6. Which of the following describes a key feature of white blood cells?**
- A. Concave shape**
 - B. Multi-lobed nucleus**
 - C. High levels of haemoglobin**
 - D. Lack of organelles**
- 7. Which of the following is NOT a viral pathogen?**
- A. Influenza virus**
 - B. Measles virus**
 - C. Staphylococcus aureus**
 - D. Mumps virus**
- 8. Where does meiosis occur in the body?**
- A. Only in somatic cells**
 - B. Only in reproductive cells**
 - C. In all types of cells**
 - D. In muscle cells**
- 9. Which of the following organelles is involved in the protein synthesis process?**
- A. Ribosomes**
 - B. Mitochondria**
 - C. Chloroplasts**
 - D. Nucleus**
- 10. Which component of the cell is responsible for producing ribosomes?**
- A. Nucleolus**
 - B. Rough endoplasmic reticulum**
 - C. Lysosome**
 - D. Nucleus**

Answers

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

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Explanations

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1. What component of DNA provides the basis for genetic diversity?

- A. The order of nucleotides**
- B. The type of sugar**
- C. The number of phosphate groups**
- D. The structural proteins**

The order of nucleotides in DNA is fundamental to genetic diversity because it determines the specific sequences that encode for genes and regulatory elements. Each nucleotide in a DNA strand consists of a phosphate group, a sugar, and a nitrogenous base. There are four types of nitrogenous bases in DNA: adenine, thymine, cytosine, and guanine. The unique sequence of these bases forms the genetic code that directs the development, functioning, and reproduction of organisms. Variations in the order of nucleotides can lead to different traits, characteristics, and functions within an organism, creating genetic diversity within populations. Mutations can also arise from changes in the nucleotide sequence, further contributing to this diversity. Therefore, variations in the order of nucleotides are crucial for evolution and adaptation, as they provide the raw material on which natural selection acts. In contrast, the type of sugar and the number of phosphate groups in DNA are consistent elements that make up the backbone and structure of all DNA molecules, playing less of a role in the diversity of genetic information. Structural proteins have important functions in packaging and organizing DNA, but they do not directly influence the genetic variations encoded in the sequence of nucleotides.

2. Which attribute of enzymes is primarily determined by their tertiary structure?

- A. Size and weight**
- B. Shape of active site**
- C. Electrical charge**
- D. Solubility in water**

The primary attribute of enzymes determined by their tertiary structure is the shape of the active site. Enzymes are proteins that catalyze biochemical reactions, and their functionality is heavily reliant on their three-dimensional shape. The tertiary structure refers to the overall folding and spatial arrangement of the protein, which is influenced by interactions between amino acids, including hydrogen bonds, ionic bonds, and hydrophobic interactions. The active site of an enzyme is specifically shaped to fit the substrate it acts upon. This shape is crucial because it determines how well the substrate can bind to the enzyme. When the substrate fits perfectly into the active site, the enzyme can effectively facilitate the conversion of substrate to product, a concept often described by the "lock and key" or "induced fit" models. If the active site is altered due to changes in the tertiary structure, either through denaturation or mutations, the enzyme may lose its ability to function properly. The other choices touch upon attributes of enzymes but are not primarily governed by their tertiary structure. For example, size and weight relate more to the number of amino acids in the protein rather than the folding, while electrical charge can be influenced by the amino acid composition and pH but is not solely a function of the tertiary structure.

3. What is the purpose of complementary base pairing in DNA structure?

- A. To allow for mutations
- B. To stabilize the double helix**
- C. To enhance replication speed
- D. To facilitate protein synthesis

The purpose of complementary base pairing is fundamentally to stabilize the double helix structure of DNA. In DNA, the bases adenine pairs with thymine, and cytosine pairs with guanine. Each base pair is held together by hydrogen bonds, which, while individually weak, together create a stable and resilient structure that maintains the integrity of the DNA. This stability is crucial for the DNA's function as the genetic material of living organisms, allowing it to withstand environmental stresses and be accurately replicated during cell division. Additionally, the specific pairing ensures that the genetic code is correctly preserved and passed on, which is essential for inheritance. While mutations and replication speed are important aspects of DNA function, they are not the primary reason for the specific pairing of bases. Protein synthesis is facilitated by the information encoded in DNA, but that process is more about the interpretation of the genetic code rather than the structural stabilization provided by complementary base pairing. Thus, the stabilization of the double helix is the core purpose of this crucial characteristic of DNA structure.

4. What role do the side chains (R groups) of amino acids play?

- A. They are the same for all amino acids
- B. They determine the specific properties of each amino acid**
- C. They make up the backbone of proteins
- D. They are not involved in protein structure

The side chains, or R groups, of amino acids are crucial in determining the specific properties and characteristics of each amino acid. Each amino acid has a unique side chain that varies in size, shape, charge, and polarity, which influences how that amino acid interacts with others in a protein. This variation is essential in dictating the overall structure and function of proteins, as the sequence of these amino acids and their respective side chains will affect how a protein folds and what kind of biochemical interactions it can participate in. For instance, some side chains are hydrophobic and will tend to be located in the interior of a protein structure to avoid water, while others are hydrophilic and may be found on the exterior, interacting with the aqueous environment. Additionally, side chains can participate in bonding and interactions such as hydrogen bonds, ionic bonds, or disulfide bridges, further stabilizing the protein's three-dimensional shape. Understanding the role of side chains helps in appreciating the complexity and functionality of proteins in biological processes.

5. What role do DNA and RNA play in genetic information handling?

- A. DNA stores genetic information, RNA synthesizes proteins**
- B. DNA transfers genetic information, RNA stores data**
- C. DNA and RNA both store genetic information**
- D. RNA holds genetic information, DNA transfers it to cells**

DNA and RNA serve distinct yet complementary roles in the handling of genetic information. DNA, or deoxyribonucleic acid, functions primarily as the storage medium for genetic information in living organisms. It contains the instructions necessary for the development, functioning, growth, and reproduction of all known life forms. The sequence of nucleotides in DNA encodes this genetic information. RNA, or ribonucleic acid, plays a crucial role in the process of translating the genetic information stored in DNA into functional proteins. Specifically, mRNA (messenger RNA) is synthesized from the DNA template in a process called transcription. This mRNA carries the coded instructions from the DNA in the nucleus to the ribosomes in the cytoplasm, where proteins are synthesized through the process of translation. Therefore, the interaction between DNA and RNA is essential for expressing the genetic code as proteins, which perform various essential functions in the cell. In this context, the chosen option accurately describes the functions of DNA and RNA: DNA is responsible for storing genetic information, while RNA is pivotal in protein synthesis, bridging the gap between the genetic code and functioning proteins in the body.

6. Which of the following describes a key feature of white blood cells?

- A. Concave shape**
- B. Multi-lobed nucleus**
- C. High levels of haemoglobin**
- D. Lack of organelles**

White blood cells, also known as leukocytes, are a vital component of the immune system, and one of their distinguishing characteristics is their multi-lobed nucleus. This feature is particularly notable in a type of white blood cell called neutrophils, which often have their nucleus divided into three to five lobes, connected by thin strands of nuclear material. This structure not only allows for greater flexibility as the cells navigate through tissues but also aids in their function of phagocytosis, where they engulf and digest pathogens. In contrast, some other options describe features that are not characteristic of white blood cells. For example, red blood cells are known for their concave shape and high levels of hemoglobin, which are crucial for their role in oxygen transport. White blood cells, however, do not carry out this function and typically contain little to no hemoglobin. Additionally, while some white blood cells do have organelles, they generally have different structures and functions compared to red blood cells, which ultimately lack a nucleus and most organelles to maximize space for hemoglobin. Thus, the multi-lobed nucleus is a defining and critical feature that enables white blood cells to perform their immune functions efficiently.

7. Which of the following is NOT a viral pathogen?

- A. Influenza virus
- B. Measles virus
- C. Staphylococcus aureus**
- D. Mumps virus

The correct choice, which identifies a non-viral pathogen, is *Staphylococcus aureus*. This organism is a type of bacteria, specifically a gram-positive cocci, and is known for causing various infections in humans, ranging from mild skin infections to more serious diseases like pneumonia and sepsis. In contrast, the other options listed are all viruses. The Influenza virus is responsible for causing the flu, a contagious respiratory illness. The Measles virus causes measles, a highly contagious viral infection characterized by fever and a distinctive rash. The Mumps virus leads to mumps, which can cause swelling of the salivary glands. These distinctions between bacterial and viral pathogens are crucial in understanding infectious diseases and their treatment options.

8. Where does meiosis occur in the body?

- A. Only in somatic cells
- B. Only in reproductive cells**
- C. In all types of cells
- D. In muscle cells

Meiosis is a specialized type of cell division that is crucial for sexual reproduction. It occurs exclusively in reproductive cells, which are the cells that give rise to gametes—sperm in males and eggs (ova) in females. This process reduces the chromosome number by half, resulting in haploid cells that ensure genetic diversity when two gametes unite during fertilization. In contrast, somatic cells, which make up the body's tissues and organs, undergo mitosis rather than meiosis. Mitosis is responsible for growth, repair, and asexual reproduction by producing identical diploid cells. Therefore, meiosis is confined to germ cells in the reproductive organs and does not take place in somatic or muscle cells, which are involved in different functions and types of cell division. This specificity is why understanding the role of meiosis within reproductive contexts is essential in biology.

9. Which of the following organelles is involved in the protein synthesis process?

- A. Ribosomes**
- B. Mitochondria**
- C. Chloroplasts**
- D. Nucleus**

Ribosomes are essential organelles that play a crucial role in the process of protein synthesis. They are responsible for translating messenger RNA (mRNA) into polypeptide chains, which then fold into functional proteins. Ribosomes can be found freely floating in the cytoplasm or attached to the endoplasmic reticulum, forming rough ER, which further complicates the process of creating proteins by providing an environment for modification and transportation. In the context of cellular machinery, while the mitochondria are involved in energy production, chloroplasts in plants are primarily associated with photosynthesis, and the nucleus houses DNA and is responsible for gene expression regulation, it is the ribosomes that directly carry out the assembly of amino acids into proteins, making them the key players in this biological process. Understanding the specific function of ribosomes highlights their importance not just as sites of synthesis but as critical components for cellular function and overall organismal health.

10. Which component of the cell is responsible for producing ribosomes?

- A. Nucleolus**
- B. Rough endoplasmic reticulum**
- C. Lysosome**
- D. Nucleus**

The nucleolus is the component of the cell specifically responsible for producing ribosomes. It is located within the nucleus and is primarily involved in the assembly of ribosomal RNA (rRNA) and the formation of ribosomal subunits. Once these subunits are assembled, they are transported out of the nucleolus into the cytoplasm, where they combine to form functional ribosomes that play a crucial role in protein synthesis. While the nucleus is essential for housing the genetic material and directing cellular activities, including ribosome production, it is the nucleolus within the nucleus that is directly responsible for the assembly of ribosomes. The rough endoplasmic reticulum, on the other hand, is involved in the synthesis and processing of proteins after ribosomes are formed, while lysosomes contain enzymes for digestion and waste processing and do not play a role in ribosome production.

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!

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