SACE Stage 2 Biology Practice Exam (Sample)

Study Guide

BY EXAMZIFY

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 process allows the transport of liquids into cells?

A. Exocytosis

B. Pinocytosis

C. Phagocytosis

D. Osmodialysis

2. What type of bond joins amino acids in a polypeptide chain?

A. Hydrogen bonds

B. Covalent bonds

C. Pepptide bonds

D. Ionic bonds

3. What isolation occurs when animals exhibit courting behaviour to attract mates?

A. Hybrid inviability

B. Gamete isolation

C. Behavioural isolation

D. Mechanical isolation

4. What role do ribozymes play in biological systems?

A. They serve as structural components of cells.

B. They catalyze biochemical reactions.

C. They store genetic information.

D. They assist in protein synthesis only.

5. Which of the following is NOT considered an abiotic factor?

A. Temperature

B. Water availability

C. Mineral composition

D. Plant species

6. What occurs during osmosis?

- **A. The movement of solutes across a semi-permeable membrane from high solute concentration to low solute concentration**
- **B. The movement of water through a membrane from low solute concentration to high solute concentration**
- **C. The active transport of molecules through carrier proteins**
- **D. The passive diffusion of molecules until equilibrium is reached**

7. What is the composition of cell walls in plants?

- **A. Chitin**
- **B. Peptidoglycan**
- **C. Cellulose**
- **D. Proteins**

8. What does the phenotype of an organism refer to?

- **A. The genetic makeup of the organism**
- **B. The observable traits of the organism**
- **C. The potential traits based on genes**
- **D. The environmental impact on gene expression**

9. In which phase of meiosis do chromosomes align in a single file along the metaphase plate?

- **A. Prophase I**
- **B. Metaphase II**
- **C. Anaphase I**
- **D. Telophase I**

10. Which method of DNA replication involves new and old strands?

- **A. Semi-conservative**
- **B. Conservative**
- **C. Dispersive**
- **D. Fragmentary**

Answers

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

Explanations

1. Which process allows the transport of liquids into cells?

A. Exocytosis

B. Pinocytosis

C. Phagocytosis

D. Osmodialysis

The process of pinocytosis is specifically responsible for the transport of liquids into cells. It is a form of endocytosis, where the cell membrane invaginates to engulf extracellular fluid and small solutes, forming a vesicle that brings these materials inside the cell. This mechanism is crucial for cells to absorb nutrients and other small molecules present in their environment. During pinocytosis, the cell essentially "drinks" the liquid, which distinguishes it from phagocytosis, a process that engulfs larger particles or cells, and exocytosis, which is the process of expelling materials from the cell. Osmotic processes, often confused with osmodialysis, involve the movement of water across a semi-permeable membrane but do not represent a mechanism for cellular uptake of liquid in the same context as pinocytosis. Thus, pinocytosis is the correct answer as it directly pertains to the transport of liquids into cells.

2. What type of bond joins amino acids in a polypeptide chain?

A. Hydrogen bonds

B. Covalent bonds

C. Pepptide bonds

D. Ionic bonds

The correct answer is the type of bond known as peptide bonds. Peptide bonds specifically form between the amino group of one amino acid and the carboxyl group of another amino acid, with the release of a molecule of water (a process known as dehydration synthesis). This covalent bond is critical for linking amino acids together to form polypeptides and ultimately proteins, which are essential for countless biological functions. While hydrogen bonds play important roles in stabilizing the three-dimensional structure of proteins by forming interactions between different parts of the polypeptide chain, they do not directly link amino acids together in a polypeptide. It is also important to note that although peptide bonds are indeed a type of covalent bond, the term "peptide bond" specifically refers to the covalent connection formed during the synthesis of proteins, thereby distinguishing it from other covalent bonds that might not involve amino acids. Finally, ionic bonds typically involve attractions between charged groups and do not form the backbone structure of polypeptides.

3. What isolation occurs when animals exhibit courting behaviour to attract mates?

A. Hybrid inviability

B. Gamete isolation

C. Behavioural isolation

D. Mechanical isolation

Behavioural isolation is recognized as a significant mechanism in the process of speciation. It occurs when different species develop distinct courtship rituals or mating behaviors that prevent them from interbreeding. In the context of animals, courting behavior can include specific actions, sounds, or displays that are unique to a species. These behaviors serve to attract mates of the same species and ensure successful reproduction, effectively keeping species separate even when they may be in the same habitat. For example, two species of birds may have different songs or elaborate mating dances that only attract individuals of the same species. When members of one species do not respond to the courting behaviors of another species, reproductive isolation is achieved. This emphasizes the importance of behavioral traits in maintaining species boundaries and promoting biodiversity.

4. What role do ribozymes play in biological systems?

A. They serve as structural components of cells.

B. They catalyze biochemical reactions.

C. They store genetic information.

D. They assist in protein synthesis only.

Ribozymes play a crucial role in biological systems by catalyzing biochemical reactions. These are RNA molecules that possess catalytic activity, enabling them to facilitate chemical reactions without the need for protein enzymes. This unique property demonstrates the versatile nature of RNA beyond its traditional role in carrying genetic information. Ribozymes are involved in various cellular processes, including RNA processing and the catalysis of peptide bond formation during protein synthesis. Their ability to promote reactions suggests that RNA may have been integral to early life forms, possibly supporting the hypothesis of an "RNA world" in the evolution of life. The other roles mentioned, such as serving as structural components, storing genetic information, or exclusively assisting in protein synthesis, are primarily attributed to proteins or DNA. While ribozymes contribute to protein synthesis, they are not limited to this function alone, further emphasizing their significance as catalysts in biochemical reactions across different biological systems.

5. Which of the following is NOT considered an abiotic factor?

A. Temperature

B. Water availability

C. Mineral composition

D. Plant species

In ecological terms, abiotic factors refer to the non-living components of an environment that influence the living organisms within it. These factors include elements like temperature, water availability, and mineral composition, all of which are vital in shaping ecosystems and determining the types of organisms that can thrive in specific areas. Plant species, on the other hand, are categorized as biotic factors. Biotic factors encompass all living aspects of an environment, including animals, plants, fungi, and microorganisms. The presence and diversity of plant species can significantly affect ecosystem dynamics, influencing interactions such as those between predators and prey, as well as competition for resources. Thus, the classification of the options reveals that while temperature, water availability, and mineral composition are all vital abiotic components impacting landscapes and habitats, plant species belong firmly within the realm of biotic factors. Understanding this distinction is critical for studying ecosystems, as it highlights the vital roles that both living and non-living factors play in ecological relationships.

6. What occurs during osmosis?

A. The movement of solutes across a semi-permeable membrane from high solute concentration to low solute concentration

B. The movement of water through a membrane from low solute concentration to high solute concentration

C. The active transport of molecules through carrier proteins

D. The passive diffusion of molecules until equilibrium is reached

During osmosis, water molecules move across a semi-permeable membrane from an area of low solute concentration to an area of high solute concentration. This process occurs in response to differences in solute concentration on either side of the membrane. The semi-permeable nature of the membrane allows water to pass through while restricting the movement of solute particles. Osmosis is a crucial biological process for maintaining cell turgor and homeostasis. For example, when a cell is placed in a hypotonic solution (where the external solute concentration is lower than that inside the cell), water flows into the cell, causing it to swell. Conversely, in a hypertonic solution, water exits the cell, leading to cell shrinkage. The other options describe different biological processes. The first option refers to the movement of solutes, which is not the focus of osmosis. The third option describes active transport, which requires energy input to move substances against their concentration gradient, making it distinct from osmosis. Finally, the fourth option mentions passive diffusion, which generally applies to solutes moving until equilibrium is achieved and does not specifically relate to water movement as in osmosis.

7. What is the composition of cell walls in plants?

A. Chitin

B. Peptidoglycan

C. Cellulose

D. Proteins

The composition of cell walls in plants is primarily cellulose. Cellulose is a complex carbohydrate made up of long chains of glucose molecules that are linked together. This structure provides strength and rigidity to the plant cell wall, allowing plants to maintain their shape and resist external pressures. Cellulose is integral for various plant functions, including growth and support. Its fibrous nature not only provides structural integrity but also plays a crucial role in maintaining turgor pressure within the cells, which helps plants stay upright and optimally oriented towards light. In contrast, chitin is a structural component found in the cell walls of fungi and the exoskeletons of arthropods, peptidoglycan is a substance forming the cell walls of many bacteria, and while proteins are present in plant cell walls, they do not serve as the primary structural component. Each of these alternatives has different functions and locations within biological systems, highlighting the unique role that cellulose plays in plants.

8. What does the phenotype of an organism refer to?

A. The genetic makeup of the organism

B. The observable traits of the organism

C. The potential traits based on genes

D. The environmental impact on gene expression

The phenotype of an organism refers to the observable traits that can be seen or measured, such as physical characteristics, behaviors, and physiological properties. These traits result from the interaction between the organism's genetic makeup, known as its genotype, and environmental influences. The concept of phenotype encompasses a wide range of characteristics, from color and shape to size and physiological responses, allowing scientists to study how specific genes manifest in an organism's appearance and behavior. Understanding phenotypes is essential in fields like genetics and evolutionary biology, as it helps researchers investigate how traits are passed on and expressed in populations over time. Other options do not accurately define phenotype; for instance, the genetic makeup pertains to the genotype, while potential traits and environmental impacts provide context about gene expression but do not encapsulate the observable aspects that define phenotype itself. This distinction underscores the importance of phenotype in understanding biological diversity and adaptation.

9. In which phase of meiosis do chromosomes align in a single file along the metaphase plate?

A. Prophase I

B. Metaphase II

C. Anaphase I

D. Telophase I

In meiosis, the phase where chromosomes align in a single file along the metaphase plate is during Metaphase II. At this stage, sister chromatids that were previously separated during Meiosis I are lined up at the metaphase plate in preparation for anaphase. This alignment is crucial as it ensures that when the sister chromatids are pulled apart, each daughter cell will receive an equal and complete set of chromosomes. During Prophase I, homologous chromosomes pair up and exchange genetic material through a process called crossing over, but they do not align along the metaphase plate. Anaphase I involves the separation of homologous chromosomes, while Telophase I marks the end of the first meiotic division when the cells are split, and the chromosomes begin to de-condense. Thus, the specific alignment of chromosomes in a single file along the metaphase plate occurs distinctly in Metaphase II of meiosis.

10. Which method of DNA replication involves new and old strands?

A. Semi-conservative

B. Conservative

C. Dispersive

D. Fragmentary

The semi-conservative method of DNA replication is characterized by each newly synthesized DNA molecule consisting of one original (old) strand and one newly created strand. This model was demonstrated in experiments by Meselson and Stahl, which showed that after one round of replication, the DNA consisted of equal parts of old and new material, confirming that each new double helix retained one of the original strands. In semi-conservative replication, when the double helix unwinds, each strand serves as a template for the formation of a new complementary strand. This process ensures that genetic information is accurately maintained across generations of cells. The result is that following replication, each daughter DNA molecule has one parental strand and one newly synthesized strand, which is crucial for maintaining genetic fidelity. The conservative method would suggest that the original double helix remains entirely intact while a completely new double helix is formed, which does not occur in biological systems. The dispersive model would imply that the parental DNA strands are broken into segments, and both strands of each new DNA molecule consist of segments from the old and new strands, which also does not accurately reflect the process observed in cells. Fragmentary replication is not a recognized model in the context of DNA replication. Thus, the semi-conservative method

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://sacestage2bio.examzify.com

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