

Ontario Grade 12 University Biology (SBI4U) Course Practice Exam (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. Which cerebral lobe is involved with visual perception?**
 - A. Frontal lobe**
 - B. Parietal lobe**
 - C. Temporal lobe**
 - D. Occipital lobe**

- 2. In what way do anabolic pathways differ from catabolic pathways?**
 - A. Anabolic pathways release energy**
 - B. Anabolic pathways are faster**
 - C. Anabolic pathways require energy**
 - D. Anabolic pathways are more common**

- 3. What is the primary role of the Golgi apparatus in a cell?**
 - A. Energy production**
 - B. Modification of lipids and proteins**
 - C. Synthesis of nucleic acids**
 - D. Storage of genetic information**

- 4. What is chromatin primarily composed of?**
 - A. Double-stranded RNA**
 - B. Unfolded DNA wrapped around proteins**
 - C. Structured proteins and lipids**
 - D. Hollow tubes of proteins**

- 5. Which enzyme is responsible for unwinding the DNA helix during replication?**
 - A. DNA polymerase**
 - B. Topoisomerase**
 - C. Helicase**
 - D. Ligase**

6. What is the function of the acid-base buffer system in the body?

- A. To enhance digestion of food**
- B. To maintain a stable pH in the body**
- C. To increase the rate of respiration**
- D. To stimulate hormone production**

7. What are cilia best known for?

- A. Facilitating photosynthesis**
- B. Producing energy through respiration**
- C. Helping with cell movement**
- D. Involved in cell division**

8. What is the typical age range for the onset of menopause in human females?

- A. 35-45 years**
- B. 40-50 years**
- C. 45-55 years**
- D. 50-60 years**

9. What is the main function of bicarbonate ions in the kidneys during pH regulation?

- A. Act as a waste product**
- B. Buffer acidity in the blood**
- C. Assist in nutrient absorption**
- D. Increase urine volume**

10. What macromolecules make up chromosomes?

- A. Nucleic acids and carbohydrates**
- B. Proteins and lipids**
- C. Nucleic acids and proteins**
- D. Carbohydrates and DNA**

Answers

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

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Explanations

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1. Which cerebral lobe is involved with visual perception?

- A. Frontal lobe
- B. Parietal lobe
- C. Temporal lobe
- D. Occipital lobe**

The occipital lobe is the region of the brain primarily responsible for visual perception. It is located at the back of the cerebral cortex and contains the primary visual cortex, which processes visual information received from the eyes. This lobe interprets the signals received from the retina, enabling us to perceive shapes, colors, and motion. The functional specialization of the occipital lobe makes it crucial for visual processing. Its interaction with other areas of the brain can help integrate visual information with memories and emotions, allowing for a more comprehensive understanding of what we see. Understanding this function is essential in areas related to vision, such as reading, recognizing faces, and navigating environments.

2. In what way do anabolic pathways differ from catabolic pathways?

- A. Anabolic pathways release energy
- B. Anabolic pathways are faster
- C. Anabolic pathways require energy**
- D. Anabolic pathways are more common

Anabolic pathways are primarily characterized by their role in synthesizing complex molecules from simpler ones, a process that inherently requires energy. This energy is often derived from ATP or other high-energy molecules, driving the reaction forward and enabling the growth and repair of cells, as well as the biosynthesis of biomolecules such as proteins, nucleic acids, and polysaccharides. In contrast, catabolic pathways involve the breakdown of larger molecules into smaller ones, a process that typically releases energy as chemical bonds are broken. This energy release is essential for fueling various cellular activities and maintaining metabolic processes. The other options either misrepresent the fundamental nature of anabolic pathways or suggest misconceptions about their frequency or speed compared to catabolic pathways. For instance, anabolic pathways are not generally faster than catabolic pathways, nor are they the more common type of metabolic process; catabolic pathways are often more prevalent due to their role in energy production.

3. What is the primary role of the Golgi apparatus in a cell?

- A. Energy production
- B. Modification of lipids and proteins**
- C. Synthesis of nucleic acids
- D. Storage of genetic information

The primary role of the Golgi apparatus in a cell is the modification of lipids and proteins. Once proteins and lipids are synthesized in the endoplasmic reticulum (ER), they are transported to the Golgi apparatus, where they undergo further processing. This processing often includes the addition of carbohydrates (glycosylation), phosphorylation, and sulfation, which are critical for the proteins' final functionality. The Golgi apparatus then sorts and packages these modified molecules into vesicles that are destined for different locations within the cell or for secretion outside the cell. This functional distinction makes the Golgi apparatus a central hub in the cellular machinery responsible for managing and directing the flow of biochemical products.

4. What is chromatin primarily composed of?

- A. Double-stranded RNA
- B. Unfolded DNA wrapped around proteins**
- C. Structured proteins and lipids
- D. Hollow tubes of proteins

Chromatin is primarily composed of unfolded DNA wrapped around proteins, specifically histones. This structure allows DNA to be packaged into a compact form to fit within the nucleus of a cell while still being accessible for processes such as transcription and replication. The association between DNA and histones forms a complex called nucleosomes, which further coil and fold to create the highly organized structure we refer to as chromatin. The composition of chromatin plays a crucial role in regulating gene expression, as the level of compaction can influence whether specific genes are accessible for transcription. The dynamic nature of chromatin can be modified through various biochemical processes, impacting how tightly or loosely the DNA is wrapped around the histones, often in response to cellular signals or environmental changes. Other options do not accurately describe the composition of chromatin. Double-stranded RNA refers to a different type of nucleic acid involved in protein synthesis and regulation, while structured proteins and lipids or hollow tubes of proteins do not reflect the presence of DNA in the chromatin structure.

5. Which enzyme is responsible for unwinding the DNA helix during replication?

- A. DNA polymerase**
- B. Topoisomerase**
- C. Helicase**
- D. Ligase**

The enzyme responsible for unwinding the DNA helix during replication is helicase. This enzyme plays a crucial role in the DNA replication process by separating the two strands of the DNA double helix, allowing each strand to serve as a template for the synthesis of a new complementary strand. Helicase works by breaking the hydrogen bonds between the base pairs of the DNA strands, thus facilitating the access of other enzymes, like DNA polymerase, to replicate the genetic material. This unwinding action is vital for the replication fork to form, which is where the actual replication occurs. Other enzymes mentioned, such as DNA polymerase, topoisomerase, and ligase, have important but distinct functions during replication. DNA polymerase synthesizes new DNA strands by adding nucleotides complementary to the template strand, topoisomerase helps relieve the tension created ahead of the replication fork by making cuts in the DNA, and ligase is responsible for joining Okazaki fragments on the lagging strand.

6. What is the function of the acid-base buffer system in the body?

- A. To enhance digestion of food**
- B. To maintain a stable pH in the body**
- C. To increase the rate of respiration**
- D. To stimulate hormone production**

The function of the acid-base buffer system in the body is to maintain a stable pH. This is crucial for various physiological processes because enzymes and metabolic activities are sensitive to changes in pH. The body employs buffers, such as bicarbonate, phosphate, and proteins, to neutralize excess acids or bases, thereby preventing drastic fluctuations in pH levels that could disrupt homeostasis. By doing so, the buffer system plays a key role in ensuring that the blood and other bodily fluids are maintained at an optimal pH, which is typically around 7.4 for human blood. This stability is vital for normal cellular functions and overall health. While other options relate to bodily functions, they do not specifically address the crucial role of the acid-base buffer system in pH regulation. For instance, the digestion process, respiratory rate, and hormone production are influenced by various factors and systems but are not directly managed by the buffer system.

7. What are cilia best known for?

- A. Facilitating photosynthesis**
- B. Producing energy through respiration**
- C. Helping with cell movement**
- D. Involved in cell division**

Cilia are best known for their role in helping with cell movement. These tiny, hair-like structures extend from the surface of many eukaryotic cells and are involved in a variety of functions related to motility. They can move in a coordinated manner to propel the cell through a fluid environment or move substances across the cell surface, such as mucus in the respiratory tract. For instance, in certain protists, cilia enable the organism to swim, while in multicellular organisms, such as humans, they play a critical role in clearing debris and pathogens from the respiratory tract. The coordinated beating of cilia is essential for proper physiological function in these contexts. Other options do not accurately define the primary function of cilia. For instance, they do not facilitate photosynthesis or produce energy through respiration; those processes are primarily associated with chloroplasts in plants and mitochondria in all eukaryotic cells, respectively. Additionally, while cilia can be involved in cell division indirectly (such as in the movement of cells during embryonic development), their primary characteristic remains their role in cell movement. Thus, the correct answer highlights the essential motility function of cilia.

8. What is the typical age range for the onset of menopause in human females?

- A. 35-45 years**
- B. 40-50 years**
- C. 45-55 years**
- D. 50-60 years**

Menopause typically occurs in human females between the ages of 45 and 55. This natural biological process marks the end of a woman's reproductive years, characterized by the cessation of menstruation and a decline in hormone production, particularly estrogen and progesterone. The average age for menopause in many populations is around 51 years, aligning well with the age range provided. The onset of menopause can vary based on genetic, environmental, and health factors, but the majority of women will experience it within this range, making the chosen answer an accurate reflection of the common timeline. Understanding this timeline is crucial for comprehending the broader aspects of female reproductive health and aging.

9. What is the main function of bicarbonate ions in the kidneys during pH regulation?

- A. Act as a waste product
- B. Buffer acidity in the blood**
- C. Assist in nutrient absorption
- D. Increase urine volume

Bicarbonate ions play a crucial role in maintaining acid-base balance within the body, particularly in the kidneys. Their primary function during pH regulation is to buffer acidity in the blood. When there is an accumulation of hydrogen ions (which increase acidity), bicarbonate ions can react with these hydrogen ions to form carbonic acid, which then dissociates to carbon dioxide and water, effectively neutralizing excess acidity. This reaction helps to maintain a stable pH level in the bloodstream, which is vital for proper physiological function. In the kidney, bicarbonate is reabsorbed from urine into the bloodstream, thereby preventing the loss of this important buffer and maintaining the correct acid-base equilibrium. Additionally, the kidneys can produce new bicarbonate ions when needed to help counteract conditions of acidosis. Therefore, the role of bicarbonate ions in the kidneys is integral to ensuring that the blood pH remains within the narrow range necessary for optimal metabolic processes.

10. What macromolecules make up chromosomes?

- A. Nucleic acids and carbohydrates
- B. Proteins and lipids
- C. Nucleic acids and proteins**
- D. Carbohydrates and DNA

Chromosomes are primarily composed of nucleic acids and proteins. The nucleic acids in chromosomes are DNA, which provides the genetic blueprint for an organism, carrying the instructions for the development and functioning of all living things. The proteins, predominantly histones, play a crucial role in packaging and organizing the DNA within the nucleus of the cell. These histone proteins bind to DNA, allowing it to be tightly coiled and condensed into the structure that we recognize as chromosomes during cell division. This complex of DNA and histone proteins is often referred to as chromatin when the cell is not dividing, highlighting the dynamic interaction between these two types of macromolecules. Other macromolecules such as carbohydrates and lipids do not have a structural role in chromosomes, thus making their inclusion in the composition of chromosomes inaccurate. Therefore, the combination of nucleic acids (DNA) and proteins (histones) directly explains the architecture and functionality of chromosomes.

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://sbi4ucourse.examzify.com>

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

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