

# UNIVERSITY OF CENTRAL FLORIDA (UCF) BSC2010C BIOLOGY I PRACTICE EXAM 2 (SAMPLE) STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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<https://ucf-bsc2010c-exam2.examzify.com>



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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 does "crenate" mean in the context of cells?**
  - A. To divide into two
  - B. To swell excessively
  - C. To burst
  - D. To shrink or shrivel
- 2. What is the typical yield of ATP per FADH molecule during cellular respiration?**
  - A. 2 ATP
  - B. 3 ATP
  - C. 4 ATP
  - D. 1 ATP
- 3. If a cell shrinks when placed in a container, what does that indicate about the container's solution?**
  - A. The solution is isotonic
  - B. The solution is hypotonic
  - C. The solution is hypertonic
  - D. The solution has no effect on the cell
- 4. What do prokaryotes lack that distinguishes them from eukaryotes?**
  - A. Nucleus
  - B. Mitochondria
  - C. Ribosomes
  - D. Chloroplasts
- 5. What is the primary role of ATP in cellular respiration?**
  - A. To transport oxygen
  - B. To store genetic information
  - C. To serve as an energy currency
  - D. To synthesize proteins

- 6. What are the requirements for a single turn of the Krebs Cycle?**
- A. 1 Acetyl CoA, 2 NAD<sup>+</sup>, 1 FAD<sup>+</sup>
  - B. 1 Acetyl CoA, 3 NAD<sup>+</sup>, 1 FAD<sup>+</sup>
  - C. 1 Acetyl CoA, 5 NAD<sup>+</sup>, 1 FAD<sup>+</sup>
  - D. 2 Acetyl CoA, 3 NAD<sup>+</sup>, 2 FAD<sup>+</sup>
- 7. Which term describes a cell that has taken in water and is swollen?**
- A. Lyse
  - B. Crenate
  - C. Turgid
  - D. Diffused
- 8. What kind of tail do phospholipids possess?**
- A. Polar tail
  - B. Nonpolar tail
  - C. Hydrophilic tail
  - D. Amphipathic tail
- 9. Which metabolic pathway occurs in the absence of oxygen?**
- A. Aerobic respiration
  - B. Krebs cycle
  - C. Fermentation
  - D. Oxidative phosphorylation
- 10. How does the concentration of molecules typically change during passive transport?**
- A. It remains constant
  - B. It decreases
  - C. It increases
  - D. It moves toward equilibrium

## **Answers**

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

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## **Explanations**

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### 1. What does "crenate" mean in the context of cells?

- A. To divide into two
- B. To swell excessively
- C. To burst
- D. To shrink or shrivel**

*In the context of cells, "crenate" specifically refers to the process where a cell shrinks or shrivels, which typically occurs when it is placed in a hypertonic solution. When a cell is in such an environment, water moves out of the cell in an attempt to balance solute concentrations, leading to the characteristic scalloped or notched appearance of the cell membrane. This process is a response to osmotic pressure changes and is vital for understanding how cells interact with their environment, especially concerning water movement and solute concentration. Crenation can have significant effects on cell function and health, emphasizing the importance of osmotic balance in biological systems.*

### 2. What is the typical yield of ATP per FADH molecule during cellular respiration?

- A. 2 ATP**
- B. 3 ATP
- C. 4 ATP
- D. 1 ATP

*In cellular respiration, FADH<sub>2</sub> contributes to the production of ATP during oxidative phosphorylation in the electron transport chain. When FADH<sub>2</sub> is oxidized, it generates enough energy to produce approximately 1.5 ATP molecules in eukaryotic cells, but in some contexts, this is often rounded to 2 ATP in introductory biology courses for simplicity. This value reflects the energy yield associated with the transfer of electrons from FADH<sub>2</sub> through the electron transport chain, which does not pump as many protons as NADH does, leading to a lower ATP yield. Overall, the reason why 2 ATP is considered the typical yield from one FADH<sub>2</sub> molecule is based on the functional role it plays in the electron transport chain and the subsequent proton motive force utilized for ATP synthesis.*

### 3. If a cell shrinks when placed in a container, what does that indicate about the container's solution?

- A. The solution is isotonic
- B. The solution is hypotonic
- C. The solution is hypertonic**
- D. The solution has no effect on the cell

*When a cell shrinks after being placed in a container, it indicates that the solution surrounding the cell is hypertonic relative to the inside of the cell. In a hypertonic solution, the concentration of solutes outside the cell is higher than the concentration of solutes within the cell. As a result, water moves out of the cell to the area of higher solute concentration in an attempt to achieve equilibrium. This loss of water causes the cell to shrink or undergo crenation. Understanding this osmotic behavior is crucial in biology, especially when considering how cells interact with their environments and respond to changes in solute concentrations. In contrast, an isotonic solution would have equal concentrations of solutes inside and outside the cell, resulting in no net movement of water and, therefore, no change in cell size. A hypotonic solution has a lower concentration of solutes compared to the inside of the cell, leading to water influx, which can cause the cell to swell or even burst. Lastly, stating that the solution has no effect on the cell would imply that the concentration of solutes is neutral to the cell's state, which doesn't reflect the shrinkage observed.*

#### 4. What do prokaryotes lack that distinguishes them from eukaryotes?

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

*Prokaryotes are characterized by the absence of a nucleus, which is a fundamental distinction between them and eukaryotes. In prokaryotic cells, the genetic material is typically organized in a single circular chromosome located in a region called the nucleoid, rather than being enclosed within a membrane-bound nucleus. This structural difference is significant as it reflects the simpler organization of prokaryotic cells compared to the more complex organization of eukaryotic cells, which have multiple linear chromosomes housed within a defined nucleus. The other components mentioned, such as mitochondria and chloroplasts, are organelles typically found in eukaryotic cells and not in prokaryotes, but they are not the defining feature that distinguishes prokaryotes from eukaryotes. Additionally, ribosomes, which are essential for protein synthesis, are present in both prokaryotic and eukaryotic cells, so they do not serve as a distinguishing factor. Thus, the lack of a nucleus is the key trait that sets prokaryotes apart from eukaryotes.*

#### 5. What is the primary role of ATP in cellular respiration?

- A. To transport oxygen
- B. To store genetic information
- C. To serve as an energy currency
- D. To synthesize proteins

*The primary role of ATP (adenosine triphosphate) in cellular respiration is to serve as an energy currency. ATP is crucial for transferring energy within cells, allowing organisms to perform various cellular functions. During cellular respiration, glucose is broken down, and the energy released is used to phosphorylate ADP (adenosine diphosphate) to produce ATP. This ATP can then be utilized by different cellular processes that require energy, such as muscle contraction, active transport across membranes, and biochemical synthesis reactions. The concept of ATP as an energy currency is fundamental because it connects the energy released from metabolic processes to the energy needs of the cell. The constant conversion between ADP and ATP provides a versatile means for cells to access stored energy quickly and efficiently. In contrast, transporting oxygen is a function primarily associated with hemoglobin in the blood, storing genetic information pertains to the roles of DNA and RNA, and protein synthesis involves ribosomes and messenger molecules rather than direct roles of ATP itself. Thus, while ATP is intimately involved in many biological processes, its defining feature as an energy currency underscores its essential role in fueling cellular activities throughout cellular respiration and beyond.*

## 6. What are the requirements for a single turn of the Krebs Cycle?

- A. 1 Acetyl CoA, 2 NAD<sup>+</sup>, 1 FAD<sup>+</sup>
- B. 1 Acetyl CoA, 3 NAD<sup>+</sup>, 1 FAD<sup>+</sup>**
- C. 1 Acetyl CoA, 5 NAD<sup>+</sup>, 1 FAD<sup>+</sup>
- D. 2 Acetyl CoA, 3 NAD<sup>+</sup>, 2 FAD<sup>+</sup>

The correct choice indicates that one turn of the Krebs Cycle requires 1 Acetyl CoA, 3 NAD<sup>+</sup>, and 1 FAD<sup>+</sup>. This is accurate because, during one complete cycle, one molecule of Acetyl CoA enters the cycle, where it is oxidized to produce energy carriers. Specifically, as Acetyl CoA combines with oxaloacetate to form citrate, the cycle continues through various enzymatic steps that result in the reduction of three NAD<sup>+</sup> molecules to NADH, and one FAD molecule to FADH<sub>2</sub>. Additionally, a molecule of GTP or ATP is also produced during the process, which contributes to the overall energy yield from cellular respiration. This requirement reflects the primary substrates and products involved in each turn of the Krebs Cycle, emphasizing the cycle's role in energy production through the oxidation of organic molecules. The numbers of NAD<sup>+</sup> and FAD<sup>+</sup> are specifically critical because they represent the electron carriers that transport high-energy electrons to the electron transport chain, which is essential for ATP synthesis in the mitochondria.

## 7. Which term describes a cell that has taken in water and is swollen?

- A. Lyse
- B. Crenate
- C. Turgid**
- D. Diffused

The term that describes a cell that has taken in water and is swollen is turgid. In plant cells, turgidity occurs when water enters the cell via osmosis, causing the central vacuole to swell. This swelling exerts pressure against the cell wall, resulting in a firm and upright structure. Turgor pressure is essential for maintaining the plant's shape and overall health. In contrast, when cells lose water, they may exhibit features such as crenation in animal cells, where the cell shrivels, or other states indicating a lack of internal pressure. The process of moving water in or out of cells can also involve diffusion, but this does not describe the state of being swollen as turgidity does. Therefore, turgid is the appropriate term to indicate the state of a cell that has absorbed water and become swollen.

## 8. What kind of tail do phospholipids possess?

- A. Polar tail
- B. Nonpolar tail**
- C. Hydrophilic tail
- D. Amphipathic tail

Phospholipids possess a unique structure that includes a hydrophobic (nonpolar) tail and a hydrophilic (polar) head. The tail is composed of long fatty acid chains, which do not interact favorably with water, making them nonpolar. This characteristic is crucial for the formation of biological membranes. When phospholipids are in an aqueous environment, they arrange themselves into bilayers, with the hydrophilic heads facing outward towards the water and the nonpolar tails pointing inward, away from the water. This arrangement is fundamental to the structural integrity and function of cell membranes. Thus, the description of the tail in phospholipids is best characterized as nonpolar, focusing on its interaction with water and its role in membrane dynamics.

## 9. Which metabolic pathway occurs in the absence of oxygen?

- A. Aerobic respiration
- B. Krebs cycle
- C. Fermentation**
- D. Oxidative phosphorylation

*The correct answer is fermentation, which is a metabolic pathway that takes place in the absence of oxygen. During fermentation, cells can convert sugars into acids, gases, or alcohol, allowing them to generate energy without relying on oxygen for their metabolic processes. This process is particularly important for organisms that live in oxygen-poor environments and for muscle cells in certain conditions. Fermentation begins with glycolysis, where glucose is broken down into pyruvate, yielding a small amount of ATP. In the absence of oxygen, the pyruvate is then converted into different end products, such as lactic acid in animals or ethanol and carbon dioxide in yeast, allowing for continuous ATP production even without aerobic respiration. In contrast, aerobic respiration, the Krebs cycle, and oxidative phosphorylation all require oxygen to function. Aerobic respiration fully oxidizes glucose in the presence of oxygen, producing a higher yield of ATP compared to fermentation. The Krebs cycle is a key part of aerobic respiration, where acetyl-CoA is oxidized to produce electron carriers, and oxidative phosphorylation refers to the final stage of aerobic respiration where ATP is generated through the electron transport chain, also requiring oxygen. Thus, fermentation is a unique metabolic pathway that enables cells to survive and produce energy under anaerobic conditions.*

## 10. How does the concentration of molecules typically change during passive transport?

- A. It remains constant
- B. It decreases
- C. It increases
- D. It moves toward equilibrium**

*During passive transport, the concentration of molecules changes as they move from an area of higher concentration to an area of lower concentration. This process is driven by the concentration gradient, and it continues until the concentrations on both sides of the membrane reach equilibrium. At equilibrium, the molecules are distributed evenly, although they may still move across the membrane due to the inherent movement of particles. This mechanism is essential for various biological processes, allowing cells to maintain homeostasis by regulating the internal concentration of substances without expending energy. Therefore, the correct choice reflects this dynamic movement towards a state of balance in concentrations, highlighting the fundamental principle of passive transport.*

## 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](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

<https://ucf-bsc2010c-exam2.examzify.com>

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

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