

AC-HPAT BIOLOGY PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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 is the primary process by which prokaryotic cells divide?**
 - A. Binary fission
 - B. Mitosis
 - C. Cytokinesis
 - D. Meiosis
- 2. Which two products are generated during light dependent reactions?**
 - A. Glucose and oxygen
 - B. ATP and NADPH
 - C. Pollen and seeds
 - D. Carbon dioxide and water
- 3. Carbohydrates contribute to cellular structure primarily by?**
 - A. Providing insulation
 - B. Serving as precursors to hormones
 - C. Modifying proteins and lipids
 - D. Creating cell membranes
- 4. What is the characteristic color of oxygenated blood in vertebrates?**
 - A. Bright red
 - B. Dark red
 - C. Blue
 - D. Green
- 5. What distinguishes lipids from carbohydrates and proteins in terms of their functions?**
 - A. Lipids are only structural components
 - B. They are not involved in signaling
 - C. They act primarily as energy-storage and signaling molecules
 - D. They have no functional roles
- 6. What is the main function of the heart during systole?**
 - A. The heart is relaxing and filling with blood
 - B. The heart is contracting and pumping blood
 - C. The heart rate decreases significantly
 - D. The heart is preparing to enter a resting state

7. What is the main function of chloroplasts in plant cells?

- A. Photosynthesis
- B. Respiration
- C. Transpiration
- D. Absorption

8. Which term refers to the complex series of procedures to help with fertility?

- A. Artificial insemination
- B. In vitro fertilization
- C. Oocyte retrieval
- D. Embryo transfer

9. What defines active transport in cellular processes?

- A. Movement from high to low concentration
- B. Movement without energy usage
- C. Requires cellular energy to move substances
- D. Occurs only in passive systems

10. In the Calvin Cycle, which two components are used to form glucose?

- A. Carbon dioxide and oxygen
- B. ATP and NADPH
- C. Water and nitrogen
- D. Glucose and starch

Answers

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

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Explanations

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1. What is the primary process by which prokaryotic cells divide?

A. Binary fission

B. Mitosis

C. Cytokinesis

D. Meiosis

The primary process by which prokaryotic cells divide is binary fission. This method of asexual reproduction is essential for prokaryotes, such as bacteria, allowing them to replicate efficiently. During binary fission, the prokaryotic cell grows to a certain size and then replicates its single chromosome. After the DNA has been copied, the cell elongates and eventually divides into two genetically identical daughter cells. This process is straightforward and allows for rapid population growth, especially favorable in environments where resources are plentiful. Mitosis, while a process of cell division, is specific to eukaryotic cells and involves complex steps such as prophase, metaphase, anaphase, and telophase, along with the formation of a mitotic spindle. Cytokinesis refers to the actual splitting of the cytoplasm following nuclear division and is often a part of the overall division process in eukaryotes, not applicable to the simplest prokaryotic division. Meiosis is a specialized form of cell division that occurs in the formation of gametes for sexual reproduction, another process not utilized by prokaryotic organisms. Thus, binary fission is distinctly suited to the characteristics and needs of prokaryotic life forms.

2. Which two products are generated during light dependent reactions?

A. Glucose and oxygen

B. ATP and NADPH

C. Pollen and seeds

D. Carbon dioxide and water

The correct answer highlights two crucial components generated during the light-dependent reactions of photosynthesis: ATP and NADPH. These reactions take place in the thylakoid membranes of chloroplasts when chlorophyll absorbs sunlight. During this process, light energy is converted into chemical energy, which is stored in the form of ATP (adenosine triphosphate) and NADPH (nicotinamide adenine dinucleotide phosphate). ATP serves as an energy currency for the cell, fueling various biochemical processes, while NADPH acts as a reducing agent, providing the necessary electrons and hydrogen for the later stages of photosynthesis, particularly in the Calvin cycle where carbon fixation occurs. In contrast, glucose is produced during the light-independent reactions (Calvin cycle), and while oxygen is released as a byproduct of splitting water molecules, it is not a direct product of the light-dependent reactions. Pollen and seeds relate to the reproductive processes of plants and not directly to photosynthesis, while carbon dioxide and water are inputs for photosynthesis rather than products of the light-dependent reactions. Thus, ATP and NADPH are the correct outputs of this initial phase of photosynthesis.

3. Carbohydrates contribute to cellular structure primarily by?

- A. Providing insulation
- B. Serving as precursors to hormones
- C. Modifying proteins and lipids**
- D. Creating cell membranes

Carbohydrates play a crucial role in cellular structure through the modification of proteins and lipids, a process known as glycosylation. This biological modification involves the addition of carbohydrate molecules to proteins or lipids, resulting in glycoproteins and glycolipids, respectively. These modified molecules are essential components of cell membranes and contribute to various functions such as cell recognition, signaling, and protection. Through glycosylation, carbohydrates help determine the characteristics and functionality of proteins and lipids in the cellular environment, influencing interactions between cells and their surroundings. For instance, the specific carbohydrate structures on the surface of cells can serve as markers for immune recognition, facilitate cell adhesion, and mediate communications between cells. While carbohydrates do have functions related to energy storage and supply, their primary contribution to cellular structure is indeed through modifying proteins and lipids, enhancing their roles in maintaining cellular integrity and facilitating communication.

4. What is the characteristic color of oxygenated blood in vertebrates?

- A. Bright red**
- B. Dark red
- C. Blue
- D. Green

Oxygenated blood in vertebrates is characterized by a bright red color. This vivid color is primarily due to the presence of oxyhemoglobin, which forms when oxygen binds to hemoglobin in red blood cells. The binding of oxygen alters the electronic configuration of hemoglobin, leading to a change in the way the protein absorbs and reflects light, resulting in the bright red appearance of blood in arteries. In contrast, deoxygenated blood, which has released its oxygen to the tissues, is darker red due to the presence of deoxyhemoglobin. The color differences can be particularly noted in veins, where blood appears darker. Although some may believe oxygenated blood might appear blue due to the color of veins, this is a misconception resulting from optical effects of skin and tissue rather than the actual color of the blood itself. Thus, the correct identification of oxygenated blood as bright red is crucial to understanding the physiological aspects of vertebrate circulatory systems.

5. What distinguishes lipids from carbohydrates and proteins in terms of their functions?

- A. Lipids are only structural components
- B. They are not involved in signaling
- C. They act primarily as energy-storage and signaling molecules**
- D. They have no functional roles

Lipids are distinct from carbohydrates and proteins primarily in their diverse roles within biological systems, particularly in energy storage and signaling. While carbohydrates serve as a quick energy source and proteins perform a multitude of functions as enzymes and structural components, lipids are unique in their ability to store energy efficiently in the form of triglycerides. This energy storage capability is attributed to the high energy density of lipids, which provides a crucial energy reserve for the organism. Moreover, lipids play significant roles in cellular signaling, which is not a primary function of carbohydrates or proteins. Certain lipids, like phospholipids, are essential in forming cell membranes, while others, such as steroid hormones, are critical in signaling pathways that regulate various physiological processes. This multifunctionality—acting as energy storage substances and as key signaling molecules—sets lipids apart from carbohydrates and proteins, making the choice that highlights their primary roles in both energy storage and signaling accurate.

6. What is the main function of the heart during systole?

- A. The heart is relaxing and filling with blood
- B. The heart is contracting and pumping blood**
- C. The heart rate decreases significantly
- D. The heart is preparing to enter a resting state

The main function of the heart during systole is to contract and pump blood throughout the body. During this phase of the cardiac cycle, the ventricles contract forcefully, which increases the pressure within them and pushes blood into the aorta and pulmonary artery from the left and right ventricles, respectively. This contraction is crucial for delivering oxygenated blood to the tissues and organs while also removing carbon dioxide and waste products. In systole, the heart effectively moves blood from its lower chambers (the ventricles) into the systemic and pulmonary circulations, ensuring that the body receives the necessary nutrients and oxygen to function properly. This phase is essential for maintaining circulation and is characterized by the closing of the atrioventricular valves and the opening of the semilunar valves, which prevents backflow and directs blood into the arteries. The other options describe phases or states that are characteristic of different parts of the cardiac cycle. For example, relaxation and filling of the heart with blood occur during diastole, which is the period following systole. A significant decrease in heart rate does not pertain directly to the active function of the heart during systole, and preparations for a resting state are associated with the heart completing its pumping cycle, transitioning back into diast

7. What is the main function of chloroplasts in plant cells?

A. Photosynthesis

B. Respiration

C. Transpiration

D. Absorption

Chloroplasts are specialized organelles found in plant cells that play a critical role in photosynthesis, the process by which plants convert light energy into chemical energy. This process allows plants to use sunlight to synthesize glucose from carbon dioxide and water, releasing oxygen as a byproduct. The presence of chlorophyll, the green pigment within chloroplasts, is essential for capturing light energy. Photosynthesis occurs in two main stages: the light-dependent reactions, which take place in the thylakoid membranes of the chloroplasts and convert light energy into chemical energy (ATP and NADPH), and the Calvin cycle, which takes place in the stroma of the chloroplasts and uses that stored energy to produce glucose. Understanding the primary function of chloroplasts as the sites of photosynthesis is crucial because it underscores the importance of these organelles in the overall energy economy of plant life, and by extension, all life on Earth, as they are foundational to food chains. Other processes, such as respiration and transpiration, while important to plant function, do not occur in chloroplasts nor are they their main function.

8. Which term refers to the complex series of procedures to help with fertility?

A. Artificial insemination

B. In vitro fertilization

C. Oocyte retrieval

D. Embryo transfer

In vitro fertilization (IVF) refers to the complex series of procedures designed to assist individuals and couples struggling with fertility challenges. This process involves several meticulous steps, beginning with ovarian stimulation to encourage the ovaries to produce multiple eggs. Once matured, the eggs are retrieved from the ovaries in a surgical procedure. The retrieved eggs are then fertilized with sperm in a laboratory setting, leading to the development of embryos. After a few days of culture, one or more of these embryos are transferred into the uterus with the aim of establishing a pregnancy. This multi-step process distinguishes IVF from the other options provided. While artificial insemination, oocyte retrieval, and embryo transfer are all components or techniques related to fertility treatments, they do not encompass the complete series of procedures that characterize in vitro fertilization. IVF integrates these steps into a singular and comprehensive treatment approach, making it a crucial option for those facing fertility challenges.

9. What defines active transport in cellular processes?

- A. Movement from high to low concentration
- B. Movement without energy usage
- C. Requires cellular energy to move substances**
- D. Occurs only in passive systems

Active transport is defined by the requirement of cellular energy to move substances against their concentration gradient. This means that it involves the movement of molecules from an area of lower concentration to an area of higher concentration. This process is crucial for maintaining homeostasis within the cell, allowing it to regulate the internal environment effectively. Cells utilize energy, often in the form of ATP, to power transport proteins that facilitate this movement. This is different from passive transport processes, which do not require energy and occur naturally due to concentration gradients, moving substances from areas of higher concentration to lower concentration. The distinction of requiring energy is fundamental to active transport, as it underlines the cell's ability to control and manipulate the movement of various ions and molecules crucial for its function. This is why active transport is a vital process in various cellular functions, such as nutrient uptake, waste removal, and maintaining ion balances. Understanding this concept is essential for grasping how cells interact with their environment and maintain internal conditions necessary for life.

10. In the Calvin Cycle, which two components are used to form glucose?

- A. Carbon dioxide and oxygen
- B. ATP and NADPH**
- C. Water and nitrogen
- D. Glucose and starch

In the Calvin Cycle, ATP and NADPH are the two critical components used to form glucose. During photosynthesis, light energy is converted into chemical energy, which is stored in the form of ATP (adenosine triphosphate) and NADPH (nicotinamide adenine dinucleotide phosphate) through processes such as the light-dependent reactions. Once these energy carriers are generated, they are utilized in the Calvin Cycle, which occurs in the stroma of chloroplasts. Here, ATP provides the energy necessary for the conversion of carbon dioxide into glucose through a series of enzymatic reactions. Simultaneously, NADPH acts as a reducing agent, donating electrons to facilitate the conversion of carbon intermediates into glucose. This makes ATP and NADPH essential for the synthesis of glucose from carbon dioxide. The other options do not contribute to glucose synthesis in the Calvin Cycle. Carbon dioxide is indeed involved in this cycle, but it is not paired with oxygen to produce glucose. Water and nitrogen are unrelated to glucose synthesis in this context, and referring to glucose and starch does not reflect the initial components involved in the formation of glucose during the Calvin Cycle.

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://achpatbiology.examzify.com>

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

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