WJEC BIOLOGY PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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.

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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!

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Questions

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1. What are key considerations in trials for biological control?

A. Will it attract more pests?

B. Will it survive the environment?

C. How many pests will it eliminate?

D. Will it enhance crop growth?

2. What is the triplet code in genetics?

A. A sequence of 2 bases coding for an amino acid

B. A sequence of 3 bases coding for an amino acid

C. A single base that determines protein structure

D. A series of amino acids coding for a protein

3. How is symbiosis defined?

A. A competition between species

B. A relationship where one species benefits and the other is harmed

C. A close ecological relationship between two or more different species

D. A nonspecific interaction among organisms

4. During which phase of the cell cycle does DNA replication occur?

A. G1 phase

B. S phase

C. G2 phase

D. M phase

5. What is the primary role of the mitochondria in a cell?

A. Storage of genetic information

B. Photosynthesis

C. Energy production

D. Protein synthesis

6. What is the role of stomata in plants?

A. To absorb sunlight for photosynthesis

B. To regulate nutrient uptake from the soil

C. To regulate gas exchange and water loss

D. To store energy in the form of starch

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7. Which process do plants use to release oxygen?

A. Cellular respiration
B. Photosynthesis
C. Transpiration
D. Evaporation

8. How is ATP generated during cellular respiration?

A. Through photosynthesis exclusively
B. Through substrate-level phosphorylation and oxidative phosphorylation
C. Through glycolysis only
D. By fermentation processes

9. What substance do lymphocytes produce to neutralize pathogens?

A. Antigens
B. Toxins
C. Antibodies
D. Enzymes

10. Which of these factors is the primary abiotic factor affecting ecosystems?

A. Temperature
B. Predation
C. Symbiosis
D. Competition

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Answers

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

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Explanations

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1. What are key considerations in trials for biological control?

A. Will it attract more pests?

B. Will it survive the environment?

C. How many pests will it eliminate?

D. Will it enhance crop growth?

In trials for biological control, one of the key considerations is whether the control agent will survive in the environment. For biological control to be effective, the introduced agent—such as a predator or pathogen—must be able to thrive in the conditions present in the target area. This means it should be able to withstand factors such as temperature, humidity, and availability of food sources. If the control agent cannot survive, it will not be able to establish itself and effectively reduce the pest population, rendering the biological control ineffective. The survival of the control agent is critical not only for immediate pest management but also for longer-term ecological balance and sustainability. If the agent does not survive, there may also be concerns about how this might disrupt local ecosystems or fail to provide a viable solution to the pest problem. Thus, assessing environmental compatibility and robustness of the control agent is fundamental in the design and implementation of biological control strategies.

2. What is the triplet code in genetics?

A. A sequence of 2 bases coding for an amino acid

B. A sequence of 3 bases coding for an amino acid

C. A single base that determines protein structure

D. A series of amino acids coding for a protein

The triplet code in genetics refers to the way in which sequences of nucleotides in DNA or RNA are translated into amino acids, the building blocks of proteins. Each amino acid is specified by a sequence of three nucleotides, known as a codon. This means that a triplet of bases corresponds to one specific amino acid. For example, the codon "AUG" codes for the amino acid methionine, which is also the start signal for protein synthesis. This coding system is crucial because it establishes the precise link between the genetic code and the amino acid sequence in proteins, allowing for the synthesis of a vast diversity of proteins necessary for life. Each combination of three bases can potentially code for one of the twenty standard amino acids, thereby creating a rich vocabulary for protein assembly. In contrast, other options do not accurately define the triplet code. A sequence of two bases would not provide enough variability to code for all 20 amino acids effectively, a single base cannot determine protein structure on its own, and a series of amino acids refers to the resultant polypeptide or protein rather than the genetic coding system.

3. How is symbiosis defined?

A. A competition between species

B. A relationship where one species benefits and the other is harmed

C. A close ecological relationship between two or more different species

D. A nonspecific interaction among organisms

Symbiosis is defined as a close ecological relationship between two or more different species. This definition highlights the nature of interactions that can occur in various forms, such as mutualism, commensalism, and parasitism, all of which involve significant interactions between different organisms in an ecosystem. The term "close" emphasizes the ongoing and often long-term nature of these relationships, which can have profound effects on the participating species. Understanding symbiosis is crucial in biology because it illustrates how different organisms can coexist and interact in their environments, influencing biodiversity and ecosystem dynamics.

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4. During which phase of the cell cycle does DNA replication occur?

A. G1 phase

B. S phase

C. G2 phase

D. M phase

DNA replication occurs during the S phase of the cell cycle, which stands for "synthesis." This phase is critical as it is when the entire genetic material is duplicated, allowing each daughter cell to receive an exact copy of the genome during cell division. In this phase, enzymes like DNA polymerases synthesize new strands of DNA, ensuring that the two strands of the double helix are replicated accurately. This process is essential for cell division, as it prepares the cell to divide and ensures that genetic information is passed on correctly to the next generation of cells. In contrast, the G1 phase involves cell growth and normal function before the DNA synthesis begins, the G2 phase is a period of further growth and preparation for mitosis without DNA replication, and the M phase refers to mitosis itself, the process of cell division. Each of these phases plays a unique role, but only the S phase is specifically dedicated to the replication of DNA.

5. What is the primary role of the mitochondria in a cell?

A. Storage of genetic information

B. Photosynthesis

C. Energy production

D. Protein synthesis

The primary role of the mitochondria in a cell is energy production. Mitochondria are often referred to as the "powerhouses" of the cell because they are the sites where cellular respiration occurs. This process involves the conversion of nutrients, primarily glucose, into adenosine triphosphate (ATP), which is the main energy currency used by cells. During cellular respiration, mitochondria utilize oxygen and produce carbon dioxide and water as byproducts, effectively generating the energy required for various cellular activities. In addition to energy production, mitochondria are also involved in other essential processes, such as regulating cellular metabolism and playing a role in cell signaling and apoptosis (programmed cell death). Their unique structure, including a double membrane, allows for the compartmentalization necessary for these functions, especially the generation of ATP via the electron transport chain in the inner membrane. Thus, the primary function of mitochondria as energy producers is fundamental to cellular life, providing the necessary energy for growth, maintenance, and the overall functioning of the cell.

6. What is the role of stomata in plants?

A. To absorb sunlight for photosynthesis

B. To regulate nutrient uptake from the soil

C. To regulate gas exchange and water loss

D. To store energy in the form of starch

Stomata are specialized openings located primarily on the surfaces of leaves, and they play a crucial role in facilitating gas exchange in plants. When stomata are open, they allow carbon dioxide from the atmosphere to enter the leaf, which is essential for photosynthesis. At the same time, oxygen, a byproduct of photosynthesis, exits through these openings. Additionally, stomata help regulate water loss from transpiration, which is the process by which water vapor is released into the atmosphere. This regulation is vital for maintaining water balance within the plant and ensuring that it does not lose too much water, especially during dry conditions. Therefore, the primary function of stomata is to effectively manage both gas exchange and water loss, making them essential for the overall health and functioning of the plant.

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7. Which process do plants use to release oxygen?

A. Cellular respiration

B. Photosynthesis

C. Transpiration

D. Evaporation

Plants release oxygen primarily through the process of photosynthesis, which occurs in their chloroplasts during the presence of light. In photosynthesis, plants take in carbon dioxide from the atmosphere and water from the soil. Using sunlight as an energy source, they convert these raw materials into glucose and oxygen. The glucose serves as energy and building material for the plant, while the oxygen produced is released as a by-product into the atmosphere. This process is crucial not only for plant life but also for most living organisms on Earth, as it replenishes oxygen in the atmosphere, which is then used by animals and humans for respiration. The light-dependent reactions of photosynthesis specifically produce oxygen when water molecules are split, releasing oxygen gas as a result of that chemical reaction. Thus, the correct answer directly relates to the critical role of photosynthesis in sustaining life on Earth through oxygen production.

8. How is ATP generated during cellular respiration?

A. Through photosynthesis exclusively

B. Through substrate-level phosphorylation and oxidative phosphorylation

C. Through glycolysis only

D. By fermentation processes

ATP is generated during cellular respiration through two main mechanisms: substrate-level phosphorylation and oxidative phosphorylation. Substrate-level phosphorylation occurs in both glycolysis and the Krebs cycle, where a phosphate group is directly transferred to ADP from a high-energy substrate molecule, resulting in the formation of ATP. This process does not require oxygen and is a relatively quick method of generating ATP. On the other hand, oxidative phosphorylation takes place in the mitochondria, where it involves the electron transport chain and chemiosmosis. In this process, electrons are transferred through a series of protein complexes, leading to the pumping of protons across the mitochondrial membrane. This creates a proton gradient that drives ATP synthase to convert ADP and inorganic phosphate into ATP. Oxidative phosphorylation is efficient and produces the majority of ATP during cellular respiration, especially in the presence of oxygen. Thus, both substrate-level phosphorylation and oxidative phosphorylation work together to provide energy in the form of ATP during the cellular respiration process. Other options either focus on processes that are not directly involved in ATP generation during cellular respiration or describe limited aspects of energy production.

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9. What substance do lymphocytes produce to neutralize pathogens?

A. Antigens

B. Toxins

C. Antibodies

D. Enzymes

Lymphocytes, a type of white blood cell, play a crucial role in the immune response, specifically in recognizing and neutralizing pathogens such as bacteria and viruses. The correct answer, antibodies, are specialized proteins produced by a subset of lymphocytes known as B cells. When a B cell encounters an antigen, which is a foreign substance that triggers an immune response, it can differentiate into a plasma cell that secretes these antibodies. Antibodies bind to specific antigens on the surface of pathogens, marking them for destruction by other immune cells or neutralizing their harmful effects directly. This process is essential for the adaptive immune system, allowing the body to remember previous infections and respond more rapidly upon re-exposure to the same pathogen. In contrast, antigens are the substances on pathogens that provoke an immune response, while toxins refer to harmful substances produced by some pathogens. Enzymes, although they can have various functions in biological systems, are not the primary agents used by lymphocytes to neutralize pathogens. Thus, recognizing that antibodies are the key defensive agents made by lymphocytes highlights their critical role in adaptive immunity.

10. Which of these factors is the primary abiotic factor affecting ecosystems?

A. Temperature

B. Predation

C. Symbiosis

D. Competition

Temperature is the primary abiotic factor affecting ecosystems because it plays a crucial role in determining the distribution of organisms, their biological activities, and the overall functioning of an ecosystem. It influences metabolic rates and growth patterns in plants and animals, affecting their survival and reproductive success. For instance, temperature variability can dictate the types of species that can thrive in a particular environment. Different organisms have specific temperature ranges they can tolerate, which influences their habitats. Additionally, temperature affects various ecological processes, such as photosynthesis in plants, which in turn impacts food webs and energy flow. In contrast, the other options refer to biotic factors, which involve interactions among living organisms rather than non-living environmental conditions. Predation and symbiosis represent interactions that shape community dynamics, while competition pertains to how organisms vie for limited resources. Although these biotic factors are essential in shaping ecosystems, they are ultimately influenced by the abiotic conditions, such as temperature, that determine the environmental context in which these interactions occur.

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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:

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

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