OCR GENERAL CERTIFICATE OF SECONDARY EDUCATION (GCSE) 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 is the primary function of thyroxine?

A. To regulate blood sugar levels

B. To regulate metabolic rate

C. To stimulate growth hormone production

D. To control blood pressure

2. How does the size of DNA fragments affect their movement in gel electrophoresis?

A. Larger fragments travel further

B. Smaller fragments travel further

C. All fragments travel the same distance

D. Larger fragments move faster

3. What is the main role of veins in the circulatory system?

A. To carry oxygenated blood

B. To transport blood to the lungs for oxygenation

C. To carry blood to the heart

D. To distribute nutrients to the body

4. What is indicated by the plateau on an enzyme activity graph?

A. The reaction rate has increased significantly

B. The reaction has stopped increasing

C. Enzymes have denatured completely

D. Substrate concentration is at its peak

5. What cells are produced by bone marrow?

A. Red blood cells only

B. White blood cells only

C. Platelets only

D. RBC, WBC, and platelets

6. How do kidneys respond when sweat causes significant water loss?

A. They conserve water and produce concentrated urine

B. They flush out all salts

C. They decrease urine production completely

D. They stop functioning temporarily

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7. What service do decomposed organic materials in forests provide for cities?

A. They filter air pollutants

B. They release carbon dioxide for urban spaces

C. They retain water like a sponge and supply rivers

D. They produce oxygen for industrial use

8. What is the primary function of respiration in living organisms?

A. To absorb nutrients from food

B. To synthesize proteins from amino acids

C. To release energy from the food consumed

D. To form glucose from carbon dioxide

9. What adaptation helps maximise the effectiveness of exchange surfaces in specialized organs?

A. Thick membranes

B. Large surface area

C. High blood pressure

D. Immobilization of cells

10. What is the location where lipase functions to break down fats?

A. In the intestines

B. In the stomach

C. In the mouth

D. In the liver

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Answers

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

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Explanations

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1. What is the primary function of thyroxine?

A. To regulate blood sugar levels

B. To regulate metabolic rate

C. To stimulate growth hormone production

D. To control blood pressure

Thyroxine, also known as T4, is a hormone produced by the thyroid gland that plays a crucial role in regulating the body's metabolic rate. By increasing the metabolism, thyroxine affects how our bodies utilize energy from the food we consume. This hormone influences the rate at which cells convert oxygen and calories into energy, thereby impacting various physiological processes such as heart rate, temperature regulation, and overall energy levels. While it is important for growth, the primary function of thyroxine is specifically tied to metabolism rather than directly stimulating growth hormone production or regulating blood sugar levels and blood pressure. These other functions are managed by different hormones and systems within the body.

2. How does the size of DNA fragments affect their movement in gel electrophoresis?

A. Larger fragments travel further

B. Smaller fragments travel further

C. All fragments travel the same distance

D. Larger fragments move faster

The movement of DNA fragments in gel electrophoresis is influenced by their size due to the nature of the gel's pores. In this technique, DNA is subjected to an electric field within a gel matrix made of agarose or polyacrylamide. When the electric field is applied, negatively charged DNA molecules migrate toward the positive electrode. Smaller DNA fragments are able to navigate through the gel's network of pores more easily than larger fragments. As a result, the smaller fragments encounter less resistance from the gel matrix, allowing them to move faster and travel further. This differential movement based on size creates a separation of DNA fragments; smaller ones will migrate further down the gel than their larger counterparts. In contrast, larger fragments face more hindrance as they attempt to squeeze through the gel matrix, which restricts their movement. The separation of DNA fragments by size is what allows for the analysis and visualization of these fragments after electrophoresis. This principle is fundamental for various applications in molecular biology, including DNA analysis and genetic fingerprinting.

3. What is the main role of veins in the circulatory system?

A. To carry oxygenated blood

B. To transport blood to the lungs for oxygenation

C. To carry blood to the heart

D. To distribute nutrients to the body

Veins play a crucial role in the circulatory system by transporting blood back to the heart. This process is essential because the heart needs a continuous flow of blood to pump oxygenated blood to the rest of the body. Most veins carry deoxygenated blood, which has delivered its oxygen to body tissues and is now returning to the heart, primarily through the superior and inferior vena cavae. The other options address functions of different parts of the circulatory system. For example, arteries are responsible for carrying oxygenated blood away from the heart to tissues, while the lungs are connected to the pulmonary circulation, where blood is sent specifically to be oxygenated. Additionally, the distribution of nutrients occurs mainly through the capillary networks following arterial delivery, not directly through the function of veins. Thus, the primary and essential role of veins is to carry blood back to the heart, ensuring that the circulatory system continues to function effectively.

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4. What is indicated by the plateau on an enzyme activity graph?

A. The reaction rate has increased significantly

B. The reaction has stopped increasing

C. Enzymes have denatured completely

D. Substrate concentration is at its peak

A plateau on an enzyme activity graph indicates that the reaction rate has reached a maximum and is no longer increasing despite any further additions of substrate or other changes in conditions. This state reflects that the enzyme has reached its saturation point, meaning that the active sites of the enzymes are fully occupied by substrate molecules. As a result, no more substrate can be converted into product, leading to a stabilization in the reaction rate. At this stage, adding more substrate will not enhance the reaction velocity because the enzyme cannot process any additional substrate until some product is released. Understanding this concept is crucial for grasping how enzymes function and interact with substrates, as it highlights the efficiencies and limits of enzymatic reactions in biological systems.

5. What cells are produced by bone marrow?

A. Red blood cells only

B. White blood cells only

C. Platelets only

D. RBC, WBC, and platelets

Bone marrow is a crucial organ in the production of various types of blood cells. It is responsible for hematopoiesis, the process by which blood cells are formed. The types of cells produced by bone marrow include red blood cells (RBCs), white blood cells (WBCs), and platelets. Red blood cells are vital for transporting oxygen throughout the body and removing carbon dioxide. White blood cells play an essential role in the immune system, helping the body to fight infections and diseases. Platelets are important for blood clotting, which prevents excessive bleeding when injuries occur. Given that bone marrow produces all three of these essential blood components, the correct answer clearly reflects its comprehensive role in hematopoiesis.

6. How do kidneys respond when sweat causes significant water loss?

A. They conserve water and produce concentrated urine

B. They flush out all salts

C. They decrease urine production completely

D. They stop functioning temporarily

The kidneys play a crucial role in maintaining the body's balance of fluids and electrolytes, particularly when there is a significant loss of water, such as through sweating. When sweat leads to decreased water levels in the body, the kidneys respond by conserving water, which is essential for preventing dehydration. To achieve this, the kidneys adjust their filtration processes. They reduce the amount of water that is excreted in urine, resulting in more concentrated urine. This concentration helps the body retain as much water as possible while still removing waste products. The hormone responsible for this process is antidiuretic hormone (ADH), which signals the kidneys to increase water reabsorption back into the bloodstream. In contrast, flushing out all salts could disrupt electrolyte balance. Decreasing urine production entirely is impractical, as the body still needs to eliminate waste. Temporarily stopping kidney function would lead to severe health risks and is not a mechanism the kidneys use to respond to dehydration. Consequently, the kidneys effectively conserve water and produce concentrated urine as a response to significant fluid loss.

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7. What service do decomposed organic materials in forests provide for cities?

A. They filter air pollutants

B. They release carbon dioxide for urban spaces

C. They retain water like a sponge and supply rivers

D. They produce oxygen for industrial use

Decomposed organic materials in forests play a vital role in the ecosystem, particularly in relation to water management. When organic matter such as leaves, fallen trees, and other plant materials decompose, they improve soil structure and enhance its ability to retain water. This process leads to better water absorption and reduces surface runoff, which is crucial for maintaining healthy water supply levels in nearby rivers and streams. This water retention acts like a sponge, helping to regulate water flow and prevent flooding in urban areas during heavy rainfall. While air pollutants filtering or the production of carbon dioxide and oxygen are important ecological processes, they don't directly link the role of decomposed materials in aiding water retention and supply to cities. Thus, the correct choice highlights how decomposed organic materials contribute to essential water management services that benefit urban environments.

8. What is the primary function of respiration in living organisms?

A. To absorb nutrients from food

B. To synthesize proteins from amino acids

C. To release energy from the food consumed

D. To form glucose from carbon dioxide

Respiration is a vital process in living organisms that primarily serves the function of releasing energy from the food consumed. This energy is essential for various life processes, including growth, movement, and maintaining homeostasis. During respiration, glucose, which is a product of food digestion, is broken down in the presence of oxygen (in aerobic respiration) to produce carbon dioxide, water, and energy in the form of ATP (adenosine triphosphate). This energy can then be utilized for cellular functions, enabling organisms to perform necessary activities that sustain life. The focus on energy release distinguishes respiration from other biological processes such as nutrient absorption or protein synthesis, which, while important, are not the core purpose of respiration itself. The formation of glucose from carbon dioxide is actually part of photosynthesis, primarily occurring in plants, rather than respiration. Thus, the primary function of respiration is accurately captured by the option concerning energy release from consumed food.

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9. What adaptation helps maximise the effectiveness of exchange surfaces in specialized organs?

A. Thick membranes

B. Large surface area

C. High blood pressure

D. Immobilization of cells

The adaptation that helps maximize the effectiveness of exchange surfaces in specialized organs is a large surface area. This is crucial because a greater surface area allows for more molecules to pass through an exchange surface at any given time, facilitating efficient gas exchange, nutrient absorption, or waste removal. For example, in the lungs, the presence of alveoli increases the surface area, thereby enhancing the oxygen and carbon dioxide exchange between the air and blood. Similarly, in the intestines, the presence of villi and microvilli provides an extensive surface area, allowing for efficient absorption of nutrients from digested food. Other adaptations, such as thin membranes, also contribute to effective exchanges, but having a large surface area is fundamental as it directly relates to the capacity for exchange to occur. In contrast, thick membranes, high blood pressure, and immobilization of cells do not enhance the surface for exchange; they can actually impede efficiency or do not directly contribute to maximizing the exchange process.

10. What is the location where lipase functions to break down fats?

A. In the intestines

B. In the stomach

C. In the mouth

D. In the liver

Lipase is an enzyme that specifically breaks down fats into fatty acids and glycerol. While lipase is indeed produced in several locations within the digestive system, its most active function occurs in the intestines where dietary fats are primarily digested. In the small intestine, bile salts emulsify fats, creating a larger surface area for lipase to perform its function efficiently. In the stomach, lipase does start the process of fat digestion, but its activity here is limited due to the acidic environment, and it is not the primary site for fat breakdown. The mouth does contain some lipase, particularly in infants, but it is not significant for adult digestion. The liver produces bile, which aids in fat digestion, but lipase itself is not produced there. Therefore, the intestines stand out as the primary location where lipase effectively breaks down fats, making that the appropriate choice.

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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:

https://ocr-gcse-biology.examzify.com

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

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