ASSESSMENT AND QUALIFICATIONS ALLIANCE (AQA) GCSE BIOLOGY PAPER 2 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. How are oxides of nitrogen formed during the combustion of fuels?

A. From sulfur reacting with oxygen

B. From nitrogen reacting with sulfur

C. By high temperatures in car engines

D. From incomplete combustion

2. What is the definition of potable water?

A. Water that is pure and contains no dissolved substances

B. Water that is safe to drink

C. Water that comes from natural springs

D. Water that has a high mineral content

3. What is the test and observation used to identify halide ions (Cl-, Br-, I-)?

A. Halide ions react with hydrochloric acid producing gas

B. Halide ions produce colourless solutions when reacted with silver nitrate

C. Halide ions react with silver nitrate to produce precipitates of different colors

D. Halide ions emit light when reacted with dilute acids

4. What caused the increase of oxygen in the Earth's atmosphere?

A. Volcanic eruptions releasing oxygen

B. Plants and algae producing oxygen through photosynthesis

C. Oxygen being released from mineral deposits

D. Cosmic radiation splitting water molecules

5. What effect does changing the concentration of a reactant have on a reversible reaction?

A. The system will remain at equilibrium

B. The concentration of all substances will change until equilibrium is reached again

C. Only the concentration of products will change

D. The reaction will stop

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6. What must phosphate rock be treated with before it can be utilized as a fertilizer?

A. Chalk

B. Water

C. Acid

D. Ammonium solution

7. Which of the following is produced when phosphate rock is treated with nitric acid?

A. Single superphosphate

B. Triple superphosphate

C. Calcium nitrate and phosphoric acid

D. Ammonium phosphate

8. What is the functional group present in carboxylic acids?

A. -OH

B. -NH2

C. -COOH

D. -CHO

9. What is the primary purpose of conducting flame emission spectroscopy?

A. To determine the pH of a solution

B. To identify solid compounds

C. To analyze metal ions in solutions

D. To check for organic compounds

10. What are the raw materials used in the Haber process?

A. Nitrogen from the air and oxygen from water

B. Nitrogen from the air and hydrogen from natural gas

C. Nitrogen from the air and ammonia from plants

D. Nitrogen from the atmosphere and sulfur from minerals

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Answers

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

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Explanations

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1. How are oxides of nitrogen formed during the combustion of fuels?

A. From sulfur reacting with oxygen

B. From nitrogen reacting with sulfur

C. By high temperatures in car engines

D. From incomplete combustion

Oxides of nitrogen are primarily formed during the combustion of fuels due to the high temperatures present in car engines. When combustion occurs at elevated temperatures, nitrogen gas (which makes up about 78% of the Earth's atmosphere) can react with oxygen to form nitrogen oxides (NO and NO2). This process is common in internal combustion engines, where temperatures can reach enough to facilitate such reactions. The formation of nitrogen oxides is particularly significant because they contribute to air pollution and can lead to the formation of smog and acid rain. The reaction generally occurs at temperatures above 1,200 degrees Celsius, which is typical in engine combustion, demonstrating the correlation between high temperatures and the production of these gases. Thus, the main mechanism responsible for the formation of oxides of nitrogen during fuel combustion is the reaction of nitrogen with oxygen at these high temperatures, making the correct answer related to how this high-temperature environment facilitates the formation of nitrogen oxides.

2. What is the definition of potable water?

A. Water that is pure and contains no dissolved substances

B. Water that is safe to drink

C. Water that comes from natural springs

D. Water that has a high mineral content

The definition of potable water is that it is water that is safe to drink. This means that it meets health standards for human consumption and does not contain harmful levels of contaminants or pathogens that could cause illness. Potable water can come from various sources, including rivers, lakes, wells, and springs, but it must be treated and tested to ensure its safety for drinking purposes. While pure water without any dissolved substances may sound ideal, pure water can actually be unsafe if it lacks minerals that are essential for human health. Therefore, simply being "pure" does not equate to being potable. Water from natural springs can be potable, but not all spring water is necessarily treated to meet safety standards. In addition, high mineral content does not inherently indicate that water is safe to drink, as excessively high levels of certain minerals can also be harmful. Thus, the most accurate definition centers on the safety aspect of drinking water.

3. What is the test and observation used to identify halide ions (Cl-, Br-, I-)?

A. Halide ions react with hydrochloric acid producing gas

B. Halide ions produce colourless solutions when reacted with silver nitrate

C. Halide ions react with silver nitrate to produce precipitates of different colors

D. Halide ions emit light when reacted with dilute acids

Halide ions, such as chloride (Cl-), bromide (Br-), and iodide (I-), can be identified through a reaction with silver nitrate (AgNO3). When halide ions are added to a solution of silver nitrate, they react to form silver halides, which are insoluble precipitates. Each type of halide leads to a different colored precipitate: - Silver chloride (AgCl) forms a white precipitate. - Silver bromide (AgBr) yields a pale yellow precipitate. - Silver iodide (AgI) results in a bright yellow precipitate. This method is reliable because the distinct colors of the precipitates allow for easy visual differentiation between the various halide ions. The specificity of the colors produced directly correlates to the identity of the halide present in the solution, making this method a common and effective qualitative test in chemistry for identifying halide ions.

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4. What caused the increase of oxygen in the Earth's atmosphere?

A. Volcanic eruptions releasing oxygen

B. Plants and algae producing oxygen through photosynthesis

C. Oxygen being released from mineral deposits

D. Cosmic radiation splitting water molecules

The increase of oxygen in the Earth's atmosphere is primarily attributed to the process of photosynthesis carried out by plants and algae. Through this process, these organisms convert carbon dioxide and water into glucose and oxygen, utilizing the energy from sunlight. This not only produces oxygen as a byproduct but also contributes to the overall balance of gases in the atmosphere. During Earth's early history, oxygen was scarce, but the advent of photosynthetic organisms around 2.4 billion years ago led to what is known as the Great Oxidation Event. This dramatic increase in atmospheric oxygen levels was primarily driven by cyanobacteria, algae, and later terrestrial plants. This rise in oxygen was crucial for the development of aerobic (oxygen-using) life forms and allowed for more complex biological processes and the eventual evolution of larger organisms. Other choices do not accurately reflect the predominant source of atmospheric oxygen. Volcanic eruptions can release various gases, but they do not contribute significantly to the production of oxygen. Similarly, while some minerals may release oxygen when they undergo chemical reactions, this process does not compare to the vast amounts generated by photosynthesis. Cosmic radiation can cause the splitting of water molecules, but this is a minor process and not the primary contributor to atmospheric oxygen levels.

5. What effect does changing the concentration of a reactant have on a reversible reaction?

A. The system will remain at equilibrium

B. The concentration of all substances will change until equilibrium is reached again

C. Only the concentration of products will change

D. The reaction will stop

Changing the concentration of a reactant in a reversible reaction impacts the system's position of equilibrium. According to Le Chatelier's principle, if the concentration of a reactant is increased, the system will adjust to counteract this change by favoring the forward reaction, leading to more products being formed. This results in the concentrations of the substances shifting until a new equilibrium is established. This dynamic ensures that the concentrations of both reactants and products will adjust in response to the change in reactant concentration. As a result, the concentration of all substances in the reaction will change until the system reaches a new state of equilibrium. This principle helps to predict how the system reacts to different changes, ensuring that a consistent balance can be maintained.

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6. What must phosphate rock be treated with before it can be utilized as a fertilizer?

A. Chalk

B. Water

C. Acid

D. Ammonium solution

Phosphate rock must be treated with acid before it can be utilized as a fertilizer because the treatment process transforms the rock into a more soluble form of phosphate that plants can readily absorb. The reaction between phosphate rock and acid generates phosphoric acid and other soluble phosphate compounds. These soluble forms are essential for plant growth, as they enable the phosphorus to be available in a form that roots can take up. In contrast, simply adding water does not facilitate the chemical transformation necessary for phosphate rocks, as they remain inert in their natural state. While chalk is often used in agricultural practices for soil amendment or pH balancing, it does not serve the purpose of converting phosphate rock into a usable form. Similarly, ammonium solution is not a treatment for phosphate rock and does not lead to the necessary solubility required for effective fertilization. Thus, acid treatment is a critical step in processing phosphate rock into a functional fertilizer.

7. Which of the following is produced when phosphate rock is treated with nitric acid?

A. Single superphosphate

B. Triple superphosphate

C. Calcium nitrate and phosphoric acid

D. Ammonium phosphate

When phosphate rock is treated with nitric acid, the reaction primarily produces calcium nitrate and phosphoric acid. The process involves the nitric acid reacting with the phosphate rock, which contains calcium phosphate. The nitric acid dissolves the calcium phosphate, resulting in the formation of phosphoric acid and calcium nitrate. This is a significant chemical reaction in the production of fertilizers, as both the phosphoric acid and the calcium nitrate can be used to enhance soil fertility. The reaction is important in agricultural practices because it provides plants with essential nutrients. Phosphoric acid supplies phosphorus, which is crucial for plant energy transfer, photosynthesis, and overall growth, while calcium nitrate provides both calcium and nitrogen, which are vital to plant health. The other options refer to different processes or products not formed when phosphate rock specifically reacts with nitric acid. Single superphosphate and triple superphosphate are products formed by treating phosphate rock with sulfuric acid rather than nitric acid. Ammonium phosphate is derived from combining ammonium and phosphate sources, which does not occur directly from the reaction of phosphate rock with nitric acid. Thus, the best answer is the production of calcium nitrate and phosphoric acid through this specific chemical reaction.

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8. What is the functional group present in carboxylic acids?

A. -OH

B. -NH2

C. -COOH

D. -CHO

Carboxylic acids are characterized by the presence of the carboxyl functional group, which is represented as -COOH. This group is unique because it consists of a carbon atom double-bonded to an oxygen atom (which forms the carbonyl part of the group) and also bonded to a hydroxyl group (-OH). This combination of functional groups gives carboxylic acids their acidic properties, as they can release a proton (H+) into solution, thus acting as acids. The other functional groups listed do not pertain to carboxylic acids. The hydroxyl group (-OH) is found in alcohols, the amino group (-NH2) is characteristic of amines, and the aldehyde group (-CHO) is specific to aldehydes. Hence, the presence of the -COOH group is what definitively identifies carboxylic acids and is key to understanding their chemical properties and reactions.

9. What is the primary purpose of conducting flame emission spectroscopy?

A. To determine the pH of a solution

B. To identify solid compounds

C. To analyze metal ions in solutions

D. To check for organic compounds

Flame emission spectroscopy is a technique primarily used to analyze metal ions in solutions. The method involves introducing a sample into a flame, where the heat excites the metal ions, causing them to emit light at characteristic wavelengths. By measuring the intensity and wavelength of this emitted light, scientists can determine the presence and concentration of specific metal ions in a solution. This method is particularly effective for analyzing metallic elements because each metal emits a unique spectrum of light when it is heated. This allows for both qualitative analysis (identifying which metals are present) and quantitative analysis (measuring how much of each metal is present). Due to these properties, flame emission spectroscopy has become a valuable tool in various fields, including environmental science, chemistry, and food safety, for detecting and quantifying metal contaminants or essential elements. Other options, such as analyzing solid compounds, determining pH, or checking for organic compounds, are not the primary applications of flame emission spectroscopy. While it can potentially be adapted for related uses, these tasks typically involve different techniques and methodologies, making the primary focus clearly on metal ion analysis.

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10. What are the raw materials used in the Haber process?

A. Nitrogen from the air and oxygen from water

B. Nitrogen from the air and hydrogen from natural gas

C. Nitrogen from the air and ammonia from plants

D. Nitrogen from the atmosphere and sulfur from minerals

The raw materials used in the Haber process are nitrogen from the air and hydrogen from natural gas. This process is a crucial industrial method for synthesizing ammonia, which is a key component in fertilizers. Nitrogen is abundant in the atmosphere, making it an ideal and readily available raw material. The hydrogen is typically sourced from natural gas (methane), through a process known as steam methane reforming, where methane reacts with steam to produce hydrogen and carbon dioxide. The Haber process itself involves the reaction of these two gases under high pressure and temperature in the presence of a catalyst, typically iron, to form ammonia (NH). This synthesis is key for the agriculture industry as it allows for the large-scale production of ammonia fertilizers, supporting global food production. The other options do not represent the correct raw materials for the Haber process. For example, oxygen is not involved in the creation of ammonia, and other materials listed, such as ammonia from plants or sulfur from minerals, are not suitable as starting materials for this specific chemical synthesis.

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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://aqa-gcse-biologypaper2.examzify.com

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

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