SQA National 5 Biology Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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

1. Which of the following best describes an aerobic process?

A. Gas exchange without oxygen

B. Energy production with oxygen

C. Reproduction in low oxygen

D. Fermentation of sugars

2. What type of protein is produced by the body to destroy or inactivate antigens that enter?

A. Antigen

B. Antibody

C. Enzyme

D. Hormone

3. What term describes an enzyme's ability to act on a specific substrate only?

A. Competitive

B. Specific

C. Variable

D. Active

4. What type of protein allows a cell to recognize specific substances?

A. Structural protein

B. Receptor protein

C. Transport protein

D. Enzyme

5. What term describes the act of obtaining food by hunting and killing prey organisms?

A. Herbivory

B. Predation

C. Parasitism

D. Competition

6. Which substance is added to soil to enhance plant growth?

A. Pesticide

B. Fertiliser

C. Herbicide

D. Insecticide

7. What type of variation is characterized by clear-cut observable categories?

A. Continuous

B. Discrete

C. Polygenic

D. Quantitative

8. What organelle contains the genetic information of an organism?

A. Mitochondrion

B. Nucleus

C. Chloroplast

D. Endoplasmic Reticulum

9. Which cells are responsible for transmitting signals in the nervous system?

A. Muscle cells

B. Neurons

C. Stem cells

D. Glial cells

10. What substance lines the trachea and bronchi to trap dust and bacteria?

A. Mucus

B. Saliva

C. Plasma

D. Serum

Answers

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

Explanations

1. Which of the following best describes an aerobic process?

A. Gas exchange without oxygen

B. Energy production with oxygen

C. Reproduction in low oxygen

D. Fermentation of sugars

An aerobic process is characterized by its dependence on oxygen to generate energy. In biological systems, aerobic respiration involves the breakdown of glucose (or other substrates) in the presence of oxygen, leading to the production of adenosine triphosphate (ATP), which is the energy currency of the cell. This process results in the complete oxidation of glucose into carbon dioxide and water, making it highly efficient in terms of energy yield compared to anaerobic processes. While gas exchange without oxygen refers to anaerobic conditions, and fermentation of sugars occurs in the absence of oxygen to produce energy, neither accurately describes an aerobic process. Similarly, reproduction in low oxygen environments does not inherently involve aerobic metabolic pathways. Therefore, the best description of an aerobic process is its ability to produce energy with the aid of oxygen.

2. What type of protein is produced by the body to destroy or inactivate antigens that enter?

A. Antigen

B. Antibody

C. Enzyme

D. Hormone

The body produces antibodies to specifically target and neutralize antigens, which are substances that the immune system recognizes as foreign or harmful, such as pathogens like bacteria and viruses. Antibodies are a type of protein known as immunoglobulins, produced by B cells in response to the presence of an antigen. Each antibody is designed to bind to a specific antigen, facilitating its destruction by various mechanisms, such as marking it for destruction by other immune cells or neutralizing its harmful effects. Antigens are not produced by the body; rather, they are the foreign molecules that provoke an immune response. Enzymes are proteins that catalyze biochemical reactions but do not directly interact with antigens in the way antibodies do. Hormones are signaling molecules that regulate physiological processes in the body but play no direct role in the immune response against antigens.

3. What term describes an enzyme's ability to act on a specific substrate only?

A. Competitive

B. Specific

C. Variable

D. Active

The correct answer is 'Specific.' This term defines the ability of an enzyme to act on a particular substrate due to the unique shape and chemical properties of the enzyme's active site, which allows it to bind only to specific substrate molecules. This specificity is crucial for the enzyme's function, as it ensures that only the intended biochemical reactions occur within the organism. Enzymes have specific structures tailored to fit their corresponding substrates, much like a key fits a lock. This specificity is essential for maintaining metabolic control in biological systems, as enzymes are involved in catalyzing reactions that are vital for life. As such, the enzyme's action on a specific substrate helps regulate various biochemical pathways and prevents unwanted reactions. The other terms do not accurately convey this concept. A competitive scenario refers to a type of inhibition where different molecules compete for the same active site, thus affecting the enzyme's activity without addressing its specificity. The term 'variable' implies changes can happen and does not relate directly to the enzyme's interaction with substrates. 'Active' generally describes an enzyme in its functional state but does not encompass the essence of substrate specificity.

4. What type of protein allows a cell to recognize specific substances?

A. Structural protein

B. Receptor protein

C. Transport protein

D. Enzyme

Receptor proteins play a crucial role in cell communication by allowing cells to recognize and respond to specific substances, such as hormones and neurotransmitters. These proteins are typically embedded in the cell membrane and have specific binding sites that are complementary in shape to the signaling molecules they recognize. When a signaling molecule binds to a receptor protein, it can trigger a series of cellular responses, influencing processes such as gene expression, metabolism, and cell growth. Structural proteins, while important for maintaining the shape and integrity of cells and tissues, do not have the specific binding properties that allow for recognition of substances. Transport proteins are responsible for moving substances across cell membranes but do not typically engage in the recognition processes that receptor proteins do. Enzymes facilitate biochemical reactions but do not function in recognition; their role is largely related to catalyzing reactions rather than identifying and binding to specific molecules. Thus, receptor proteins are distinctly recognized for their ability to enable cells to detect and react to particular substances in their environment.

5. What term describes the act of obtaining food by hunting and killing prey organisms?

A. Herbivory

B. Predation

C. Parasitism

D. Competition

The term that describes the act of obtaining food by hunting and killing prey organisms is predation. This process involves a predator, which is the organism that hunts, capturing and consuming its prey. Predation is a crucial ecological interaction that helps regulate population sizes within ecosystems and contributes to the flow of energy through the food web. When a predator hunts its prey, it demonstrates key behaviors and adaptations that enable its success in finding and capturing food. This includes strategies like stealth, speed, and specialized body structures that enhance hunting efficiency. The relationships within predation can also affect the evolution of both the predator and prey species, influencing their physical and behavioral characteristics over time. To clarify the other terms: herbivory refers to the consumption of plants by animals, parasitism is a relationship where one organism benefits at the expense of another, often without killing it, and competition involves organisms striving for the same resources in a given environment, which can include food, space, or mates. Each of these terms represents different ecological interactions, but only predation specifically pertains to the act of hunting and killing for food.

6. Which substance is added to soil to enhance plant growth?

A. Pesticide

B. Fertiliser

C. Herbicide

D. Insecticide

Fertiliser is added to soil to enhance plant growth because it contains essential nutrients that plants require for optimal development. These nutrients typically include macronutrients such as nitrogen, phosphorus, and potassium, which support various physiological processes including root development, blooming, and fruit production. By supplying these vital substances, fertilisers help improve plant health, increase crop yields, and promote overall growth. In contrast, pesticides are used to control pests and diseases that can negatively impact plant health, but they do not directly provide nutrients. Herbicides are designed to kill unwanted plants or weeds, which can free up nutrients and resources for desirable plants but do not enhance growth themselves. Insecticides target insect pests that can harm plants but similarly do not supply the nutrients necessary for growth. Thus, the role of fertiliser is distinct and pivotal in the context of enhancing plant growth.

7. What type of variation is characterized by clear-cut observable categories?

A. Continuous

B. Discrete

C. Polygenic

D. Quantitative

The type of variation characterized by clear-cut observable categories is discrete variation. Discrete variation occurs when individuals can be sorted into distinct categories based on specific traits, such as flower color (e.g., purple or white) or the ability to roll one's tongue (either the ability to roll it or not). This type of variation doesn't show any intermediate forms; individuals fall into one category or another without blending. In contrast, continuous variation involves traits that can take on a range of values and do not have distinct categories. Examples include height or skin color, which vary gradually rather than categorically. Polygenic traits result from the interaction of multiple genes, often leading to continuous variation as well. Quantitative variation typically refers to measurable traits that also show a range rather than distinct categories.

8. What organelle contains the genetic information of an organism?

A. Mitochondrion

B. Nucleus

C. Chloroplast

D. Endoplasmic Reticulum

The nucleus is the organelle that contains the genetic information of an organism. It houses the cell's DNA, which is organized into chromosomes. This genetic material carries the instructions necessary for the growth, development, functioning, and reproduction of the organism. The DNA in the nucleus is crucial for processes such as cell division, where it ensures that genetic information is accurately copied and passed on to daughter cells. In addition to housing DNA, the nucleus is also the site where RNA is transcribed from DNA, which plays a key role in protein synthesis. This process is essential, as proteins perform a wide range of functions within the cell, from structural roles to serving as enzymes to facilitate biochemical reactions. The other organelles listed, while important for various cellular functions, do not contain genetic information. Mitochondria are primarily involved in energy production, chloroplasts in photosynthesis, and the endoplasmic reticulum in protein and lipid synthesis, but none of these organelles house the genetic material like the nucleus does.

9. Which cells are responsible for transmitting signals in the nervous system?

A. Muscle cells

B. Neurons

C. Stem cells

D. Glial cells

Neurons are the specialized cells responsible for transmitting signals in the nervous system. These cells have a unique structure that allows them to carry electrical impulses over long distances, facilitating communication between different parts of the body. Neurons consist of a cell body, dendrites, and an axon. Dendrites receive signals from other neurons or sensory receptors, while the axon transmits these signals away from the cell body to other neurons, muscles, or glands. This transmission of signals occurs through a process called synaptic transmission, where the axon terminals release neurotransmitters that cross synapses to communicate with adjacent cells. This mechanism allows for rapid and efficient signaling, which is essential for coordinating bodily functions and responses to stimuli. In contrast, the other types of cells mentioned play different roles. Muscle cells are involved in movement rather than signal transmission, stem cells are undifferentiated cells that can develop into various types of cells but do not transmit signals directly, and glial cells support and protect neurons, but they do not carry signals themselves.

10. What substance lines the trachea and bronchi to trap dust and bacteria?

A. Mucus

B. Saliva

C. Plasma

D. Serum

Mucus is the correct choice because it serves a critical function in the respiratory system by trapping dust, bacteria, and other particles that enter the airways. The lining of the trachea and bronchi contains specialized cells called goblet cells, which produce mucus. This sticky substance helps to filter and clean the air as it passes through the respiratory passages, preventing harmful particles from reaching the lungs. Additionally, tiny hair-like structures called cilia work in conjunction with the mucus; they beat in a coordinated manner to push the trapped debris upward toward the throat, where it can be swallowed or expelled. Other substances like saliva, plasma, and serum do not fulfill this specific protective role in the respiratory tract. Saliva is primarily involved in digestion and oral health, while plasma and serum, components of blood, are not related to respiratory mucosal functions. Hence, mucus is essential for the respiratory system's defense mechanisms.

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://sqanational5biology.examzify.com

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