SQA National 5 Biology Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

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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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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. **What is the name of the animal storage carbohydrate located in the liver and muscle tissues?**

   A. Glucose

   B. Starch

   C. Glycogen

   D. Cellulose

2. **Which term describes a group of tissues that work together for a specific function?**

   A. System

   B. Cell

   C. Organ

   D. Tissue

3. **Which factor from the environment, such as predation or disease, affects population dynamics by leading to the death of some individuals?**

   A. Carrying capacity

   B. Selection pressure

   C. Biotic potential

   D. Environmental resistance

4. **What is the name of the muscular organ that pumps blood around the body?**

   A. Lung

   B. Heart

   C. Kidney

   D. Liver

5. **Which type of pressure affects the survival of individuals within a population due to natural selection?**

   A. Reproductive pressure

   B. Selection pressure

   C. Evolutionary pressure

   D. Environmental pressure

6. What is the term for the alleles an organism has for a particular characteristic, often represented by symbols?

A. Phenotype

B. Genotype

C. Karyotype

D. Allele frequency

7. What is the name of the circular genetic material found in bacterial cells that is often used in genetic engineering?

A. Chromatin

B. Chromosome

C. Plasmid

D. Ribosome

8. Which of the following functions to speed up a chemical reaction by reducing the required activation energy?

A. Enzyme

B. Catalyst

C. Substrate

D. Inhibitor

9. What type of diagram represents the relative number of organisms at each level in a food chain?

A. Pyramid of energy

B. Pyramid of numbers

C. Pyramid of biomass

D. Pyramid of diversity

10. What does an indicator species help determine in an ecosystem?

A. Species diversity

B. Conservation status

C. Level of pollution

D. Predator-prey relationships

Answers

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

Explanations

1. What is the name of the animal storage carbohydrate located in the liver and muscle tissues?

A. Glucose

B. Starch

C. Glycogen

D. Cellulose

The storage carbohydrate found in animal tissues, specifically in the liver and muscles, is glycogen. Glycogen serves as a crucial energy reserve for animals, allowing them to efficiently store glucose that can be mobilized when needed, especially during periods of fasting or intense exercise. It is a polysaccharide made up of long chains of glucose molecules and is highly branched, which enables rapid release of glucose when energy is required. In contrast, glucose is a simple sugar and is not a storage form itself but rather serves as a primary energy source for cells. Starch is the storage carbohydrate found in plants, composed of long chains of glucose molecules, and is not present in animal cells. Cellulose, also found in plants, is a structural carbohydrate that provides rigidity to plant cell walls and does not serve as an energy storage molecule in animals. Understanding the role of glycogen in energy metabolism highlights its importance as a critical resource for sustaining cellular activities.

2. Which term describes a group of tissues that work together for a specific function?

A. System

B. Cell

C. Organ

D. Tissue

The term that describes a group of tissues working together for a specific function is "organ." An organ is made up of different types of tissues that collaborate to perform a particular task or function within an organism. For example, the stomach is an organ that contains muscle tissue, connective tissue, and epithelial tissue, all of which work together to digest food. In contrast, the other terms refer to different biological structures. "System" refers to a group of organs that work together to perform complex functions, such as the digestive system, which includes organs like the stomach and intestines. "Cell" is the basic unit of life, representing the smallest structural and functional unit of an organism. "Tissue" refers to a group of similar cells that perform a specific function but does not encompass multiple tissue types working together like an organ does.

3. Which factor from the environment, such as predation or disease, affects population dynamics by leading to the death of some individuals?

A. Carrying capacity

B. Selection pressure

C. Biotic potential

D. Environmental resistance

The correct choice highlights the influence of selection pressure on population dynamics. Selection pressure refers to any external factor, such as predation, disease, or competition, that impacts the survival and reproduction of individuals within a population. When selection pressures are applied, they can result in increased mortality rates for less fit individuals, thereby affecting population size and composition over time. This phenomenon can lead to evolutionary changes as certain traits become favorable for survival in the face of these pressures. Carrying capacity, on the other hand, is the maximum population size that an environment can sustain indefinitely, influenced by available resources rather than specific mortality factors. Biotic potential refers to the maximum reproductive capacity of an organism under optimal environmental conditions, which does not directly account for environmental factors leading to death. Environmental resistance encompasses various limiting factors in an ecosystem that prevent populations from growing indefinitely, which includes selection pressures but is a broader term. Hence, selection pressure distinctly identifies how specific factors impact individual mortality within a population.

4. What is the name of the muscular organ that pumps blood around the body?

A. Lung

B. Heart

C. Kidney

D. Liver

The muscular organ that pumps blood around the body is the heart. This organ is a vital component of the circulatory system, responsible for maintaining blood circulation throughout the body. The heart contracts rhythmically to create pressure that pushes blood into the arteries, delivering oxygen and nutrients to cells while also facilitating the removal of carbon dioxide and waste products. The other choices serve different functions in the body. The lungs are responsible for gas exchange, allowing oxygen to enter the blood and carbon dioxide to be expelled. The kidneys filter blood to remove waste and excess substances from the body, producing urine. The liver has various functions, including detoxification, synthesis of proteins, and production of biochemicals necessary for digestion. Only the heart specifically fulfills the role of pumping blood, which makes it the correct answer.

5. Which type of pressure affects the survival of individuals within a population due to natural selection?

A. Reproductive pressure

B. Selection pressure

C. Evolutionary pressure

D. Environmental pressure

The correct answer is selection pressure, which refers to the various factors within an environment that can influence the survival and reproduction of individuals in a population. These pressures arise from the competition for resources, predation, disease, and other environmental challenges that determine which traits are advantageous or disadvantageous for survival. When certain traits enhance an individual's ability to survive and reproduce in a given environment, those traits are more likely to be passed down to future generations. This is a fundamental concept of natural selection, as individuals with favorable adaptations are more likely to thrive and produce offspring. The other options, while they may relate to ecological and evolutionary concepts, do not precisely define the factors that drive natural selection as effectively as selection pressure does. Reproductive pressure typically refers to factors influencing reproduction rates rather than survival. Evolutionary pressure suggests broad changes over time but lacks specificity regarding survival in a population. Environmental pressure relates to external conditions affecting organisms but doesn't capture the idea of natural selection directly.

6. What is the term for the alleles an organism has for a particular characteristic, often represented by symbols?

A. Phenotype

B. Genotype

C. Karyotype

D. Allele frequency

The term that describes the alleles an organism possesses for a specific characteristic is known as the genotype. The genotype consists of the genetic makeup, represented by symbols that denote the different alleles, such as 'AA' for homozygous dominant, 'Aa' for heterozygous, or 'aa' for homozygous recessive. This genetic configuration determines the potential traits that can be expressed in the organism, although the actual observable traits may also be influenced by environmental factors. In contrast, phenotype refers to the observable characteristics or traits of an organism, which are the result of the genotype interacting with the environment. Karyotype refers to the number and appearance of chromosomes in the nucleus of a cell, which is not specific to the alleles of a particular characteristic. Allele frequency pertains to how often a particular allele appears in a population and does not apply to an individual organism's specific set of alleles.

7. What is the name of the circular genetic material found in bacterial cells that is often used in genetic engineering?

A. Chromatin

B. Chromosome

C. Plasmid

D. Ribosome

The circular genetic material found in bacterial cells that is often used in genetic engineering is known as a plasmid. Plasmids are small, circular pieces of DNA that exist independently of the chromosomal DNA within bacterial cells. Their structure allows them to replicate independently, making them particularly useful tools in genetic engineering and biotechnology. Researchers frequently insert genes of interest into plasmids to create recombinant DNA. These engineered plasmids can then be introduced into bacterial cells through a process called transformation, allowing the bacteria to express new traits, such as antibiotic resistance or the production of proteins. This capability of plasmids to enable the transfer of genetic material makes them invaluable for cloning and manipulating genes in various applications, ranging from medicine to agriculture.

8. Which of the following functions to speed up a chemical reaction by reducing the required activation energy?

A. Enzyme

B. Catalyst

C. Substrate

D. Inhibitor

The correct answer is that a catalyst speeds up a chemical reaction by reducing the required activation energy. Catalysts are substances that increase the rate of a reaction without themselves undergoing any permanent chemical change. They achieve this by providing an alternative pathway for the reaction with lower activation energy, allowing more reactant molecules to successfully collide and react at a given temperature. While enzymes are specialized types of catalysts that are biological in nature, the term "catalyst" encompasses both biological and non-biological substances that facilitate chemical reactions. Therefore, while enzymes can also speed up reactions, the broader term for any substance that does so is catalyst, making it the most precise answer in this context. Substrates refer to the reactants that enzymes act upon and do not play a role in altering activation energy themselves. Inhibitors, on the other hand, are substances that decrease the rate of a reaction or prevent it altogether, which is the opposite of what the question is asking. Thus, the concept of a catalyst encompasses the essential function required, making it the correct choice.

9. What type of diagram represents the relative number of organisms at each level in a food chain?

A. Pyramid of energy

B. Pyramid of numbers

C. Pyramid of biomass

D. Pyramid of diversity

The correct choice represents the relative number of organisms at each level in a food chain is the pyramid of numbers. This type of diagram visually conveys how many individual organisms are found at each trophic level, providing insight into the population dynamics within an ecosystem. In a pyramid of numbers, the base typically shows the largest number of producers (e.g., plants), which support a smaller number of primary consumers (e.g., herbivores), and even fewer secondary consumers (e.g., carnivores). This reflects the energy transfer and ecological interactions where each trophic level supports the next one above it. This approach does not account for the total mass of organisms (which would be represented by the pyramid of biomass) or the energy content (indicated by the pyramid of energy). Additionally, the concept of diversity relates to the variety of species within an ecosystem, which is not specifically illustrated through the numbers of organisms at each level.

10. What does an indicator species help determine in an ecosystem?

A. Species diversity

B. Conservation status

C. Level of pollution

D. Predator-prey relationships

An indicator species is a type of organism that provides insight into the health of an ecosystem, particularly in relation to environmental conditions. The primary role of an indicator species is to signal the level of pollution within a habitat. These species are sensitive to changes in their environment and can reflect the impacts of pollutants such as heavy metals, chemicals, or changes in pH. When the population of an indicator species declines or changes in health, it serves as a warning that the ecosystem is experiencing stress due to pollution. For example, certain species of lichen are known to be sensitive to air quality; their presence often indicates clean air, while their absence may suggest higher levels of air pollution. Similarly, in aquatic environments, specific species of fish or invertebrates can indicate levels of water pollution or changes in water quality. While species diversity, conservation status, and predator-prey relationships are important aspects of ecosystem dynamics, they do not specifically indicate pollution levels in the same way that indicator species do. Thus, understanding the role of indicator species is crucial for assessing the health of an ecosystem and determining the impact of pollution on the environment.

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!