

BIOLOGY REGENTS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



Prepare with structure. Pass with confidence



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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. 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

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- 1. How has the burning of fossil fuels primarily harmed the environment?**
 - A. Decreased acid rain
 - B. Added carbon dioxide to the atmosphere
 - C. Increased biodiversity
 - D. Depleted the ozone shield
- 2. Natural selection is most rapid in which type of species?**
 - A. Species with long reproductive cycles
 - B. Complex multicellular organisms
 - C. Pathogens killed by antibiotics
 - D. Species with short reproductive cycles
- 3. What is the function of mitochondria in a cell?**
 - A. To produce ATP through cellular respiration
 - B. To store genetic information
 - C. To synthesize proteins
 - D. To transport materials within the cell
- 4. What is one negative effect of human land use on ecosystems?**
 - A. More homes
 - B. Successful economic growth
 - C. Less biodiversity
 - D. Increased food production
- 5. Why are homeowners encouraged to remove invasive plants from their properties?**
 - A. To allow only one type of native plant to grow
 - B. To preserve biodiversity
 - C. To eliminate unfamiliar food sources
 - D. To increase the rate of ecological succession
- 6. In what direction does energy flow through an ecosystem?**
 - A. From consumers to producers to decomposers
 - B. From decomposers to producers
 - C. From producers to consumers to decomposers
 - D. From one species to another in a food chain

7. How does botulinum toxin affect nerve cell communication?

- A. It alters the DNA structure.
- B. It inhibits ATP production.
- C. It blocks a signaling molecule necessary for communication.
- D. It disrupts digestive hormone levels.

8. What is the role of the endocrine system?

- A. To regulate body temperature
- B. To produce and secrete hormones that regulate bodily functions
- C. To manage the immune system response
- D. To maintain homeostasis through the nervous system

9. What are the building blocks of proteins?

- A. Fatty acids
- B. Nucleotides
- C. Amino acids
- D. Monosaccharides

10. What impacts does deforestation have on local wildlife?

- A. Increased habitat availability
- B. Loss of biodiversity
- C. Stabilization of ecosystems
- D. Reduction of invasive species

Answers

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

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Explanations

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1. How has the burning of fossil fuels primarily harmed the environment?

- A. Decreased acid rain
- B. Added carbon dioxide to the atmosphere**
- C. Increased biodiversity
- D. Depleted the ozone shield

Burning fossil fuels primarily harms the environment by adding carbon dioxide to the atmosphere. This process contributes significantly to the greenhouse effect, leading to global warming and climate change. Carbon dioxide is a major greenhouse gas that traps heat in the Earth's atmosphere, resulting in rising temperatures, changing weather patterns, and various ecological impacts. The increase in atmospheric carbon dioxide levels also affects ocean chemistry, leading to phenomena such as ocean acidification, which can harm marine life. The increase in carbon dioxide from fossil fuel combustion disrupts the natural balance of gases in the atmosphere, exacerbating environmental issues like extreme weather events, melting ice caps, and rising sea levels. This underscores the importance of transitioning to renewable energy sources to mitigate these harmful effects.

2. Natural selection is most rapid in which type of species?

- A. Species with long reproductive cycles
- B. Complex multicellular organisms
- C. Pathogens killed by antibiotics
- D. Species with short reproductive cycles**

Natural selection tends to occur more rapidly in species with short reproductive cycles because these organisms can reproduce quickly and frequently, allowing for a greater number of generations to occur in a relatively short period of time. This fast reproduction facilitates the spread of advantageous traits throughout a population, as beneficial mutations can be passed on more rapidly and increase in frequency. For example, bacteria, which often have very short generation times, can show significant evolutionary changes in just a few days or weeks. This allows them to adapt to environmental pressures, such as antibiotics, very swiftly. In contrast, species with long reproductive cycles, such as many larger animals, reproduce less frequently, which slows down the process of natural selection. Similarly, while complex multicellular organisms can exhibit traits shaped by evolution, their longer life spans and reproductive cycles decrease the speed at which natural selection can drive change. Pathogens that are killed by antibiotics can demonstrate rapid evolution, but they do so primarily because of their short generation times rather than their classification as pathogens, reinforcing the concept that short reproductive cycles enhance the process of natural selection.

3. What is the function of mitochondria in a cell?

- A. To produce ATP through cellular respiration
- B. To store genetic information
- C. To synthesize proteins
- D. To transport materials within the cell

Mitochondria are often referred to as the "powerhouses" of the cell due to their key role in producing adenosine triphosphate (ATP), which is the primary energy currency of the cell. This process occurs through cellular respiration, specifically during the stages of glycolysis, the Krebs cycle, and oxidative phosphorylation that take place within the mitochondria. The structure of mitochondria is especially suited for this function, as they have a double membrane that creates distinct compartments, facilitating the various enzymatic reactions required for ATP production. The inner membrane is folded into cristae, increasing the surface area available for the chemical reactions involved in energy production, while the mitochondrial matrix contains enzymes essential for the Krebs cycle. The other choices highlight important cell functions but do not accurately describe the primary role of mitochondria. For example, storing genetic information is typically associated with the nucleus, synthesizing proteins primarily takes place in ribosomes, and transporting materials within the cell involves structures like the endoplasmic reticulum and vesicles. Therefore, the function of mitochondria as the site of ATP production through cellular respiration is paramount for supporting all cellular activities that require energy.

4. What is one negative effect of human land use on ecosystems?

- A. More homes
- B. Successful economic growth
- C. Less biodiversity
- D. Increased food production

One significant negative effect of human land use on ecosystems is the reduction of biodiversity. As humans develop land for various purposes—such as agriculture, urbanization, and infrastructure—natural habitats are often destroyed or altered. This destruction can lead to the loss of plant and animal species that rely on those ecosystems for survival. When diverse habitats are converted into monocultures, such as single-crop farms or urban areas, this limits the variety of species that can thrive in those environments. Consequently, the genetic diversity within those species also diminishes, which compromises their resilience and ability to adapt to changes, diseases, or environmental pressures. Reduced biodiversity can destabilize ecosystems, affecting their productivity, resilience, and the services they provide, such as pollination, water purification, and climate regulation. Thus, the impact of human land use that leads to less biodiversity is a critical concern in discussions about sustainability and environmental conservation.

5. Why are homeowners encouraged to remove invasive plants from their properties?

- A. To allow only one type of native plant to grow
- B. To preserve biodiversity**
- C. To eliminate unfamiliar food sources
- D. To increase the rate of ecological succession

Homeowners are encouraged to remove invasive plants from their properties primarily to preserve biodiversity. Invasive species often outcompete native plants for resources such as sunlight, water, and nutrients. This competition can lead to a decline in native plant populations, which in turn affects the animals and other organisms that depend on those plants for survival. Biodiversity is crucial for ecosystem stability and resilience, as a variety of species can better withstand environmental changes and disturbances. Promoting native plants contributes to a balanced ecosystem where various organisms can thrive. By removing invasive species, homeowners help to restore and maintain the complex web of interactions that define healthy ecosystems, thereby supporting a greater variety of life forms and promoting ecological health.

6. In what direction does energy flow through an ecosystem?

- A. From consumers to producers to decomposers
- B. From decomposers to producers
- C. From producers to consumers to decomposers**
- D. From one species to another in a food chain

Energy flows through an ecosystem in a specific sequence that reflects the relationships among different trophic levels. It starts with producers, such as plants and algae, which capture energy from the sun through photosynthesis. This energy is stored in their biomass. From producers, energy is transferred to consumers, which can be herbivores that eat plants or carnivores that eat other animals. As consumers ingest producers, they obtain the stored energy. Each time energy is transferred from one trophic level to the next, some energy is lost as heat, which is why energy flow is a one-way path and not cyclical. Finally, decomposers, such as fungi and bacteria, break down dead organic matter from both producers and consumers, recycling nutrients back into the ecosystem. They also play a crucial role in energy flow, as their activity allows for the continued availability of nutrients for producers. This sequence illustrates that energy flows from producers to consumers and ultimately to decomposers, emphasizing the interconnectedness of these groups within an ecosystem.

7. How does botulinum toxin affect nerve cell communication?

- A. It alters the DNA structure.
- B. It inhibits ATP production.
- C. It blocks a signaling molecule necessary for communication.**
- D. It disrupts digestive hormone levels.

Botulinum toxin primarily affects nerve cell communication by blocking the release of a neurotransmitter called acetylcholine. This neurotransmitter is essential for transmitting signals from nerve cells to muscles, enabling muscle contraction and movement. The toxin affects the synaptic vesicles in the nerve endings, preventing their fusion with the cell membrane, which is necessary for the release of acetylcholine into the synaptic cleft. When acetylcholine release is inhibited, the muscle fibers cannot receive the signals needed for contraction, leading to paralysis. This mechanism underlies the toxin's potency and why it can be dangerous in the context of food poisoning, as it disrupts normal neuromuscular function. The other options involve different mechanisms that do not directly pertain to how botulinum toxin operates. Altering DNA structure does not relate to the action of the toxin, and while ATP production is crucial for many cellular processes, its inhibition is not the primary mechanism by which botulinum toxin exerts its effects. Disruption of digestive hormone levels is also not relevant to the specific action of botulinum toxin on nerve communication.

8. What is the role of the endocrine system?

- A. To regulate body temperature
- B. To produce and secrete hormones that regulate bodily functions**
- C. To manage the immune system response
- D. To maintain homeostasis through the nervous system

The endocrine system plays a crucial role in the body by producing and secreting hormones, which are chemical messengers that travel through the bloodstream to target organs and tissues. These hormones regulate a wide array of bodily functions, including growth and development, metabolism, reproduction, and mood. The secretion of hormones occurs in various glands, such as the pituitary, thyroid, adrenal glands, and pancreas, and each gland has its specific functions and target tissues. For instance, insulin from the pancreas regulates blood glucose levels, while thyroid hormones influence metabolic rate. This system's coordination of hormone release allows the body to respond effectively to changes internally and externally, thereby maintaining overall health and optimal functioning. While other systems, like the nervous system, also play roles in homeostasis and bodily functions, the endocrine system uniquely focuses on hormonal regulation, distinguishing it from functions such as regulation of body temperature or immune responses.

9. What are the building blocks of proteins?

- A. Fatty acids
- B. Nucleotides
- C. Amino acids**
- D. Monosaccharides

Proteins are essential macromolecules made up of smaller units called amino acids. Each amino acid consists of a basic amino group, an acidic carboxyl group, and a unique side chain or R group that determines the specific characteristics of that amino acid. There are 20 different amino acids that combine in various sequences to form proteins. Proteins can have diverse functions, such as acting as enzymes, transporting molecules, providing structural support in cells and tissues, and playing roles in immune response. The unique sequence of amino acids in a protein ultimately determines its structure and function, making them vital for biological processes in all living organisms. In contrast, fatty acids are the building blocks of lipids, nucleotides make up nucleic acids like DNA and RNA, and monosaccharides are the simplest forms of carbohydrates, serving as the building blocks for more complex sugars. Each of these components plays a distinct role in biological systems, but amino acids are uniquely responsible for the formation of proteins.

10. What impacts does deforestation have on local wildlife?

- A. Increased habitat availability
- B. Loss of biodiversity**
- C. Stabilization of ecosystems
- D. Reduction of invasive species

Deforestation significantly impacts local wildlife primarily through the loss of biodiversity. When forests are cleared or degraded, the habitats that countless species rely on for shelter, food, and breeding are destroyed. This habitat loss can lead to decreases in species populations and even extinction, particularly for those species that are endemic or have specialized habitat requirements. Biodiversity is crucial for ecosystem stability and resilience; a loss of biodiversity means fewer species that can perform vital ecological roles, which may lead to further imbalances in the ecosystem. As different species disappear, the complex interdependencies within the food web and ecosystem functions can break down, leading to degraded environments that can no longer support the wildlife that once thrived there. The other options, such as increased habitat availability and stabilization of ecosystems, contradict the reality of what deforestation entails. Likewise, the idea that deforestation leads to a reduction of invasive species is inaccurate, as cleared areas can often become susceptible to invasive species that thrive in disturbed environments.

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://regents-biology.examzify.com>

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

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