JLAB BIOLOGY SOL PRACTICE TEST (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 significance of genetic diversity in a population?

A. It reduces the chances of extinction

B. It ensures all individuals are identical

C. It increases competition among individuals

D. It delays reproductive maturity

2. The discovery that chromosomes are involved in inheritance was made possible by the invention of the -

A. electron microscope

B. stereoscope

C. compound microscope

D. dissecting microscope

3. Which process is primarily responsible for creating genetic diversity in a population?

A. Mutations

B. Natural selection

C. Gene flow

D. Reproductive isolation

4. What primary role do leaves play in plants regarding sunlight?

A. Storing energy

B. Photosynthetic conversion of light energy

C. Absorbing water from the soil

D. Transmitting nutrients

5. In unicellular organisms like Paramecium, where is food contained after ingestion?

A. Nucleus

B. Ribosome

C. Vacuole

D. Mitochondria

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6. What hypothesis is best supported by a graph illustrating an increase in the food supply of cardinals?

A. The cardinals dispersed over a larger area

B. The cardinals' food supply increased

C. The cardinals migrated to a different habitat

D. No significant changes occurred in the cardinal population

7. What term is used to describe a symbiotic relationship in which one organism benefits and the other is harmed?

A. Mutualism

B. Parasitism

C. Commensalism

D. Symbiosis

8. If two heterozygous tall pea plants are crossed, what percent of the offspring will probably be short?

A. 50%

B. 75%

C. 25%

D. 10%

9. What procedure should have been changed to avoid errors when comparing plant transpiration rates at different humidity levels?

A. Using two types of water

B. Testing in different soil types

C. Both groups should have been tested in the same soil type at each humidity level

D. Applying fertilizers equally

10. What flaw was identified in the biology class experiment with planaria in salt water?

A. They did not use enough planaria

B. There was no control

C. The salt concentration was incorrect

D. Planaria cannot survive in salt water

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Answers

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

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Explanations

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1. What is the significance of genetic diversity in a population?

A. It reduces the chances of extinction

B. It ensures all individuals are identical

C. It increases competition among individuals

D. It delays reproductive maturity

Genetic diversity is significant in a population primarily because it reduces the chances of extinction. When a population has a wide range of genetic variation, it enhances its ability to adapt to changing environments, resist diseases, and cope with various ecological challenges. This adaptability is crucial for survival, as diverse genetic traits allow some individuals to thrive under different conditions, ensuring that at least part of the population can endure when faced with stresses such as climate change, habitat loss, or disease outbreaks. In contrast, populations that lack genetic diversity tend to have a homogeneous genetic makeup, making them more vulnerable to extinction. If all individuals are genetically similar, a single threat can decimate the entire population, as there may be insufficient variation to enable some individuals to survive and reproduce. Consequently, the presence of genetic diversity not only increases a population's resilience and adaptability but also supports the establishment of robust ecosystems, as diverse populations contribute to the overall health and functioning of their environments.

2. The discovery that chromosomes are involved in inheritance was made possible by the invention of the -

A. electron microscope

B. stereoscope

C. compound microscope

D. dissecting microscope

The discovery that chromosomes are involved in inheritance was significantly aided by the invention of the compound microscope. This type of microscope allows for higher magnification and improved resolution compared to other microscopes, enabling scientists to observe cells in greater detail. Through the use of the compound microscope, researchers could visualize the behavior of chromosomes during cell division (mitosis and meiosis). These observations were crucial in linking the physical structures within cells, namely chromosomes, to the processes of heredity and inheritance. This connection laid the groundwork for modern genetics, as it demonstrated that chromosomes carry the genetic information passed from one generation to the next. The compound microscope's ability to reveal these details was not matched by other types of microscopes at the time, such as the dissecting microscope or stereoscope, which are better suited for viewing larger, three-dimensional objects rather than the fine details within cells.

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3. Which process is primarily responsible for creating genetic diversity in a population?

A. Mutations

B. Natural selection

C. Gene flow

D. Reproductive isolation

Gene flow is the process that significantly contributes to genetic diversity within a population. It occurs when individuals from different populations interbreed, resulting in the transfer of genetic material between these groups. This mixing of genes can introduce new alleles into a population's gene pool, enhancing genetic variation. As individuals migrate from one population to another, they bring their unique genetic traits, which can enrich the genetic makeup of the receiving population. This is particularly important in maintaining and enhancing the health and adaptability of a population, as greater genetic diversity can lead to increased resilience against diseases and environmental changes. Other aspects, such as mutations, natural selection, and reproductive isolation, play roles in evolution and shaping genetic variation, but they operate in different ways. Mutations introduce new genetic variations but occur randomly. Natural selection acts on existing variations by favoring certain traits, while reproductive isolation can limit gene flow through barriers, which may ultimately lead to reduced genetic diversity rather than its enhancement.

4. What primary role do leaves play in plants regarding sunlight?

A. Storing energy

B. Photosynthetic conversion of light energy

C. Absorbing water from the soil

D. Transmitting nutrients

Leaves are primarily responsible for the photosynthetic conversion of light energy into chemical energy. This process occurs in the chloroplasts, which contain chlorophyll—the pigment that captures light energy. During photosynthesis, leaves take in carbon dioxide from the air and water from the soil and use the light energy to convert these substances into glucose (a type of sugar) and oxygen. The glucose produced serves as an energy source for the plant and can be stored for later use, thus fulfilling the plant's energy needs. While leaves play a role in storing energy and can contribute to water absorption through their stomata, these processes are secondary compared to the main function of photosynthesis. Similarly, while leaves may have some role in nutrient transmission, the primary focus in terms of their interaction with sunlight is the conversion of light energy into a form that the plant can utilize for growth and energy.

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5. In unicellular organisms like Paramecium, where is food contained after ingestion?

A. Nucleus

B. Ribosome

C. Vacuole

D. Mitochondria

In unicellular organisms such as Paramecium, food is contained in a structure called a vacuole after ingestion. Vacuoles are membrane-bound sacs within the cell that serve various roles, one of which is the storage of nutrients. When Paramecium takes in food, it forms a food vacuole around the ingested particles. This food vacuole then moves within the cytoplasm, where enzymes can break down the food into smaller, usable molecules. Once the food is digested, the nutrients can be absorbed by the cell to provide energy and support cellular functions. This process is essential for the organism's survival, as it allows for nutrient acquisition in an environment where food must be actively sought and ingested. The vacuole, therefore, plays a crucial role in the feeding mechanism of these simple organisms.

6. What hypothesis is best supported by a graph illustrating an increase in the food supply of cardinals?

A. The cardinals dispersed over a larger area

B. The cardinals' food supply increased

C. The cardinals migrated to a different habitat

D. No significant changes occurred in the cardinal population

The hypothesis that the cardinals' food supply increased is well-supported by the graph illustrating an increase in food supply for these birds. An increase in the food supply provides more resources for the cardinals, which can lead to a variety of positive effects on their population, such as improved survival rates, better reproduction, and increased population growth. When food is more abundant, cardinals can more easily find sufficient nourishment, which is crucial for their health and reproductive success. This correlation between food availability and the well-being of an organism is a fundamental concept in ecology, highlighting how vital resources like food influence animal populations directly. Other hypotheses, such as cardinals dispersing over a larger area or migrating to a different habitat, do not directly address the impact of increased food supply, which is the focal point of the question. Similarly, the idea that no significant changes occurred contradicts the concept of how food supply influences population dynamics. Therefore, the best hypothesis supported by the given graph is indeed that the cardinals' food supply increased.

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7. What term is used to describe a symbiotic relationship in which one organism benefits and the other is harmed?

A. Mutualism

B. Parasitism

C. Commensalism

D. Symbiosis

The term that describes a symbiotic relationship where one organism benefits while the other is harmed is parasitism. In parasitism, one organism, known as the parasite, derives nutrients or some advantage from another organism, referred to as the host. This relationship often results in harm to the host, which can include a variety of negative effects such as disease, impairment, or even death. Mutualism, in contrast, describes a relationship where both organisms benefit from their interaction. Commensalism involves one organism benefiting while the other is not significantly harmed or helped. Symbiosis is a broader term that encompasses any kind of close ecological relationship between two different organisms, which can include parasitism, mutualism, and commensalism among others. Thus, parasitism is specifically defined by the dynamic of one party benefiting at the expense of the other.

8. If two heterozygous tall pea plants are crossed, what percent of the offspring will probably be short?

A. 50%

B. 75%

C. 25%

D. 10%

When two heterozygous tall pea plants are crossed, their genotypes can be represented as Tt (where T represents the tall allele and t represents the short allele). The possible combinations of alleles for the offspring can be determined using a Punnett square, which illustrates how gametes combine. For the cross of Tt x Tt, the Punnett square will show the following combinations: - TT (homozygous tall) - Tt (heterozygous tall) - Tt (heterozygous tall) - tt (homozygous short) By counting these combinations, we see: - 1 TT (tall) - 2 Tt (tall) - 1 tt (short) This results in a ratio of 3 tall plants to 1 short plant. Therefore, when calculating the percentage of offspring that will likely be short, you take the number of short plants (1) out of the total number of plants (4), giving you a 25% chance. This information confirms that the correct answer is that 25% of the offspring will probably be short. The other percentages provided do not align with the classic Mendelian inheritance pattern observed in this genetic scenario.

9. What procedure should have been changed to avoid errors when comparing plant transpiration rates at different humidity levels?

A. Using two types of water

B. Testing in different soil types

C. Both groups should have been tested in the same soil type at each humidity level

D. Applying fertilizers equally

To accurately compare plant transpiration rates at different humidity levels, it is essential to ensure that all variables are controlled as much as possible. Using the same soil type for both groups at each humidity level eliminates any potential effects that different soil types could have on water retention, nutrient availability, and overall plant health. If different soil types were used, variations in soil composition could influence transpiration rates due to factors such as drainage, moisture retention, and root health. By controlling for soil type, any differences observed in transpiration rates can be more confidently attributed to the effect of humidity levels alone, leading to more reliable and valid results in the experiment.

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10. What flaw was identified in the biology class experiment with planaria in salt water?

A. They did not use enough planaria

B. There was no control

C. The salt concentration was incorrect

D. Planaria cannot survive in salt water

The identification of a lack of control in the experiment with planaria in salt water is significant because a control group is essential for establishing a baseline for comparison. In any scientific experiment, having a control allows researchers to understand how the dependent variable (in this case, the response of the planaria to the salt water) is affected by the independent variable (the salt concentration). Without a control group, it's challenging to determine if the observed effects on the planaria were indeed due to the salt water or other environmental factors that may not have been controlled. Including a control group—such as planaria in freshwater—would provide necessary data to compare against the planaria exposed to salt water, thereby strengthening the validity and reliability of the findings. This highlights the importance of experimental design in scientific research, where careful consideration of what constitutes a control can make a substantial difference in the interpretation of results.

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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:

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

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