

UNIVERSITY OF CENTRAL FLORIDA (UCF) BSC1005 BIOLOGICAL PRINCIPLES PRACTICE EXAM 2 (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. In which biome would you expect to find the most seasonal variation in temperature?**
 - A. Tropical rainforest
 - B. Desert
 - C. Temperate forest
 - D. Tundra
- 2. Which of the following describes a recessive allele?**
 - A. Determines appearance if present
 - B. Masked by a dominant allele
 - C. Always expresses a phenotype
 - D. Effects are visible in heterozygous genotypes
- 3. What happens during crossing over?**
 - A. Chromosomes duplicate
 - B. Homologous chromosomes exchange DNA segments
 - C. Chromosomes are randomly sorted
 - D. Gametes are formed with the same genetic material
- 4. What term describes the growth of new individuals from severed body parts?**
 - A. Fission
 - B. Budding
 - C. Fragmentation
 - D. Polyploidy
- 5. What is a characteristic of sympatric speciation?**
 - A. New species arise from physical barriers
 - B. New species arise in the same location as the original population
 - C. New species only appear after a mass extinction
 - D. New species arise solely through genetic mutations

6. What is genetic drift?

- A. A predictable change in allele frequencies
- B. An unpredictable fluctuation of genetic characteristics from one generation to the next
- C. A method of natural selection
- D. A process that increases genetic variation

7. Which cells are not considered somatic cells?

- A. Skin cells
- B. Sperm cells
- C. Muscle cells
- D. Nerve cells

8. Which process involves breaking off a body part that can regrow?

- A. Mitosis
- B. Fission
- C. Fragmentation/Regeneration
- D. Crossing Over

9. Which cells undergo mitosis?

- A. Only germ cells
- B. Only prokaryotic cells
- C. All body cells except germ cells
- D. Only plant cells

10. What characterizes a polar molecule?

- A. A molecule with equal distribution of charge
- B. A molecule with an uneven distribution of charge, resulting in partially positive and negative ends
- C. A molecule that is hydrophobic
- D. A molecule with no charge

Answers

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

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Explanations

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1. In which biome would you expect to find the most seasonal variation in temperature?

- A. Tropical rainforest
- B. Desert
- C. Temperate forest**
- D. Tundra

In a temperate forest biome, you can expect to find the most seasonal variation in temperature due to the distinct changes that occur throughout the year. Temperate forests experience four distinct seasons: spring, summer, autumn, and winter. Each of these seasons brings significant shifts in temperature, with warm summers and cold winters contributing to this variation. During spring and summer, temperatures rise, allowing for a vigorous growth of plant life, while in autumn, temperatures begin to drop, leading to the shedding of leaves from deciduous trees. Winter brings cold temperatures, which can often lead to frost and snow. This clear seasonal differentiation is a defining characteristic of temperate forests. In contrast, other biomes, such as tropical rainforests, have relatively stable and warm temperatures year-round due to their equatorial location, while deserts, though they can have extreme temperature fluctuations, do not experience the same seasonal shifts. The tundra, although it does exhibit cold winters and brief growing seasons, does not show as pronounced a temperature variation as temperate forests because of its generally cooler climate year-round. Thus, temperate forests are the biome characterized by the most significant seasonal temperature variation.

2. Which of the following describes a recessive allele?

- A. Determines appearance if present
- B. Masked by a dominant allele**
- C. Always expresses a phenotype
- D. Effects are visible in heterozygous genotypes

A recessive allele is one that does not produce an observable effect on an organism's phenotype when a dominant allele is also present. In the presence of a dominant allele, the traits associated with the recessive allele are masked, meaning that they are not expressed in the organism's appearance or trait. For example, if we consider flower color, a dominant allele may produce purple flowers, while a recessive allele may produce white flowers. If an individual has one dominant allele for purple flowers and one recessive allele for white flowers, the dominant purple trait will be exhibited, and the white trait will not be observed. It is only when the individual has two copies of the recessive allele (homozygous recessive) that the white flower trait appears. This information illustrates why the correct description of a recessive allele highlights its role as being masked by a dominant allele.

3. What happens during crossing over?

- A. Chromosomes duplicate
- B. Homologous chromosomes exchange DNA segments**
- C. Chromosomes are randomly sorted
- D. Gametes are formed with the same genetic material

During crossing over, homologous chromosomes exchange DNA segments, which occurs during prophase I of meiosis. This process is crucial for genetic diversity, as it allows for new combinations of alleles to form on each chromosome. When homologous chromosomes align closely together, they can break and rejoin to trade segments. This exchange of genetic material creates recombinant chromosomes, contributing to variations in the traits of offspring. The other options do not accurately describe crossing over. Chromosomes duplicating refers to the process that occurs before meiosis begins, while random sorting involves the independent assortment of chromosomes rather than the exchange of genetic material between them. Gametes formed with the same genetic material do not reflect the genetic diversity introduced by crossing over, as crossing over specifically leads to different genetic combinations.

4. What term describes the growth of new individuals from severed body parts?

- A. Fission
- B. Budding
- C. Fragmentation**
- D. Polyploidy

Fragmentation is a form of asexual reproduction where new individuals grow from severed or separated body parts of a parent organism. This process involves the breaking of an organism into pieces, each of which can then develop into a new individual. This method of reproduction is observed in various organisms, including certain starfish, flatworms, and some species of plants. In contrast, fission refers to the splitting of a single organism into two or more separate organisms, typically seen in simpler life forms like bacteria. Budding, on the other hand, is a process where a new organism grows off the parent organism as a smaller version and eventually detaches. Lastly, polyploidy is a genetic condition involving the duplication of chromosomes, which is more relevant in the context of speciation and genetic variation than in asexual reproduction.

5. What is a characteristic of sympatric speciation?

- A. New species arise from physical barriers
- B. New species arise in the same location as the original population**
- C. New species only appear after a mass extinction
- D. New species arise solely through genetic mutations

The correct answer highlights that sympatric speciation occurs when new species arise within the same geographic area as the original population. This form of speciation does not rely on physical barriers that separate populations, as seen in allopatric speciation. Instead, it often involves mechanisms such as behavioral changes, temporal isolation, or polyploidy, particularly in plants, where a population may diverge into different reproductive groups even while living in the same location. This can lead to reproductive isolation, facilitating the emergence of new species without geographical separation. The other options focus on different mechanisms or conditions for speciation, such as physical barriers that define allopatric speciation or the requirement of mass extinctions which are not necessary for sympatric speciation to occur. They also suggest that genetic mutations alone can lead to new species, which may be a part of the process but does not encompass the full spectrum of sympatric speciation.

6. What is genetic drift?

- A. A predictable change in allele frequencies
- B. An unpredictable fluctuation of genetic characteristics from one generation to the next**
- C. A method of natural selection
- D. A process that increases genetic variation

Genetic drift refers to the random changes in allele frequencies within a population from one generation to the next, primarily due to chance events. It is a mechanism of evolution that can lead to significant shifts in genetic variation, particularly in smaller populations where random events can have a more pronounced impact. This unpredictability arises because allele frequencies can increase or decrease not due to selective pressures but rather due to random sampling of the population. For example, if a natural disaster drastically reduces the size of a population, the surviving members' genetic makeup may not represent the original population's genetic diversity. Over time, certain alleles may become more common or completely lost from the population purely by chance, which demonstrates the essence of genetic drift. Genetic drift contrasts with methods of natural selection, which are predictable and involve differential survival and reproduction based on advantageous traits. Additionally, it does not systematically increase genetic variation, as it can lead to the loss of alleles and reduce diversity within a population.

7. Which cells are not considered somatic cells?

- A. Skin cells
- B. Sperm cells**
- C. Muscle cells
- D. Nerve cells

Sperm cells are classified as gametes rather than somatic cells. Somatic cells are all the body cells except for the reproductive cells, which include sperm and egg (oocyte) cells. Skin cells, muscle cells, and nerve cells, on the other hand, are all examples of somatic cells that contribute to the structure and function of the body. In essence, while somatic cells are involved in the physical makeup and functioning of an organism, gametes like sperm are specifically involved in sexual reproduction and are not considered part of the body's somatic cell line.

8. Which process involves breaking off a body part that can regrow?

- A. Mitosis
- B. Fission
- C. Fragmentation/Regeneration**
- D. Crossing Over

The process that involves breaking off a body part that can regrow is known as fragmentation or regeneration. This is a form of asexual reproduction commonly observed in certain organisms such as starfish, planarians, and some types of worms. In fragmentation, an organism can split into pieces, and under suitable conditions, these pieces can develop into new individuals. The ability to regenerate lost body parts is also an essential aspect of this process, allowing the organism to recover from injury or reproduce. This remarkable capability reflects a unique biological adaptation that enhances survival in various environments. The other processes mentioned do not involve the same mechanism of regenerating lost body parts. Mitosis is a type of cell division for growth and repair, while fission refers to a process where an organism divides into two or more parts, each capable of growing into a new organism, but it does not specifically entail the regrowth of a lost part. Crossing over is a genetic process that occurs during meiosis, where sections of DNA are exchanged between homologous chromosomes, and is unrelated to body part regeneration.

9. Which cells undergo mitosis?

- A. Only germ cells
- B. Only prokaryotic cells
- C. All body cells except germ cells**
- D. Only plant cells

Mitosis is the process of cell division that results in two genetically identical daughter cells from a single parent cell. This process is essential for growth, tissue repair, and asexual reproduction in multicellular organisms. In the context of the options provided, all body cells except germ cells are capable of undergoing mitosis. Germ cells, which include sperm and egg cells, undergo a different type of cell division called meiosis. Meiosis is essential for sexual reproduction as it reduces the chromosome number by half, allowing for genetic diversity when gametes fuse during fertilization. In contrast, all somatic cells, or body cells, undergo mitosis to maintain and repair tissues and to contribute to overall growth. This includes a wide range of cell types such as skin cells, muscle cells, and blood cells. This significant role of mitosis in somatic cells emphasizes why the option that indicates all body cells excluding germ cells is the correct answer.

10. What characterizes a polar molecule?

- A. A molecule with equal distribution of charge
- B. A molecule with an uneven distribution of charge, resulting in partially positive and negative ends**
- C. A molecule that is hydrophobic
- D. A molecule with no charge

A polar molecule is characterized by an uneven distribution of electrical charge, which means that it has regions that are partially positive and partially negative. This occurs because of differences in electronegativity between the atoms involved in the molecule's bonds. In a polar bond, one atom attracts the shared electrons more strongly, leading to a dipole moment, where one end of the molecule has a slight positive charge (δ^+) and the other end has a slight negative charge (δ^-). This polarity allows polar molecules to interact effectively with other polar substances, such as water, which is why many biological processes depend on polar molecules. The presence of partial charges also influences the solubility of these molecules in different environments. For instance, polar molecules are typically soluble in water, a polar solvent, which is crucial for various biological reactions and processes. In contrast, a molecule with an equal distribution of charge lacks these regions of partial positive and negative charges, making it non-polar. Hydrophobic molecules generally do not interact well with water and are usually non-polar. Therefore, the distinctive feature of polar molecules is indeed the uneven distribution of charge that results in both positive and negative ends.

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://ucf-bsc1005-exam2.examzify.com>

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

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