

Semmelweis Medicine Biology Entrance 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. 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. What is produced at the end of mitosis?**
 - A. Four genetically unique gametes**
 - B. Two identical diploid daughter cells**
 - C. Two haploid gametes**
 - D. Two diploid cells with mutations**

- 2. Which of the following are simple forms of lipids?**
 - A. Proteins, oils, and sugars**
 - B. Fats, oil and wax**
 - C. Starches, fats, and proteins**
 - D. Sugars, oils, and fatty acids**

- 3. What term refers to a condition where an organism has three sets of chromosomes?**
 - A. Aneuploidy**
 - B. Monoploidy**
 - C. Triploidy**
 - D. Diploidy**

- 4. What is the primary structural role of tubulin in cellular biology?**
 - A. Acting as signaling molecules**
 - B. Forming hollow tubes 25 nanometers in diameter**
 - C. Producing energy for the cell**
 - D. Transporting genetic material**

- 5. What are carbohydrates primarily composed of?**
 - A. Carbon, Hydrogen and Oxygen**
 - B. Nitrogen, Carbon and Oxygen**
 - C. Hydrogen, Oxygen and Sulfur**
 - D. Carbon, Hydrogen and Nitrogen**

- 6. During which phase of meiosis does recombination occur?**
 - A. Prophase I**
 - B. Metaphase I**
 - C. Prophase II**
 - D. Telophase I**

7. What role do alveoli play in respiration?

- A. They store blood from the heart**
- B. They facilitate the exchange of gases**
- C. They detect changes in oxygen levels**
- D. They regulate blood flow to the lungs**

8. What type of polysaccharide is mainly found in dietary fiber?

- A. Starch**
- B. Cellulose**
- C. Glycogen**
- D. Maltose**

9. What essential nutrient does the thyroid gland use to produce its hormones?

- A. Calcium**
- B. Sodium**
- C. Iodine**
- D. Iron**

10. What are spinal reflexes primarily characterized by?

- A. Slow and complex actions**
- B. Simple pathways generating rapid muscle contractions**
- C. Involuntary movements requiring brain involvement**
- D. Complex neural pathways requiring sensory inputs**

Answers

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

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Explanations

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1. What is produced at the end of mitosis?

- A. Four genetically unique gametes
- B. Two identical diploid daughter cells**
- C. Two haploid gametes
- D. Two diploid cells with mutations

At the end of mitosis, the process yields two identical diploid daughter cells. This is a key characteristic of mitosis, which is a type of cell division responsible for growth, repair, and asexual reproduction in somatic cells. During mitosis, the genetic material is duplicated, and through a series of phases (prophase, metaphase, anaphase, and telophase), the chromosomes are evenly divided between the two new cells. As a result, each daughter cell receives an exact copy of the parent cell's DNA, maintained in a diploid state, meaning they have two sets of chromosomes. This ensures genetic consistency across cells, which is crucial for proper functioning and development within an organism.

2. Which of the following are simple forms of lipids?

- A. Proteins, oils, and sugars
- B. Fats, oil and wax**
- C. Starches, fats, and proteins
- D. Sugars, oils, and fatty acids

The correct answer focuses on the characteristics of simple forms of lipids, which include fats, oils, and waxes. These substances are primarily composed of fatty acids and glycerol, which are essential components of lipid structure. Fats and oils are classified as triglycerides, where three fatty acid molecules are esterified to one glycerol molecule. They're known for their roles in energy storage, insulation, and as a source of essential fatty acids. Waxes, on the other hand, are esters of long-chain fatty acids with long-chain alcohols, providing protective coatings for plants and animals as well as contributing to waterproofing. This choice accurately reflects the definition of simple lipids because each of these components is primarily made up of fatty acids. The other options include substances that either do not fall under the lipid category or are more complex, like proteins and sugars, which are not classified as lipids. Thus, this choice appropriately identifies simple forms of lipids based on their structure and biological function.

3. What term refers to a condition where an organism has three sets of chromosomes?

- A. Aneuploidy**
- B. Monoploidy**
- C. Triploidy**
- D. Diploidy**

The term that refers to a condition in which an organism has three sets of chromosomes is triploidy. In a triploid organism, there are three complete sets of chromosomes instead of the usual two sets that occur in diploid organisms. This condition can occur in various species and is particularly noted in some plants and a few animal species. Triploidy can result from errors during cell division, such as failure of the chromosomes to separate properly during meiosis, leading to gametes that have an abnormal number of chromosomes. When two such gametes come together during fertilization, the resulting zygote ends up with three sets of chromosomes. Understanding triploidy is essential in genetics as it can lead to unique characteristics in the organism, and in many cases, triploid organisms may have reduced fertility or may be sterile. This condition is an important topic in the study of genetic variations and chromosomal abnormalities.

4. What is the primary structural role of tubulin in cellular biology?

- A. Acting as signaling molecules**
- B. Forming hollow tubes 25 nanometers in diameter**
- C. Producing energy for the cell**
- D. Transporting genetic material**

Tubulin plays a crucial role in cellular biology primarily by forming microtubules, which are hollow tubes approximately 25 nanometers in diameter. These microtubules are integral components of the cytoskeleton, providing structural support to cells and playing key roles in maintaining cell shape, facilitating intracellular transport, and enabling the separation of chromosomes during cell division. The hollow structure of microtubules allows for flexibility and stability, making them essential for various cellular processes. Microtubules are involved in the movement of organelles and vesicles within cells, as they serve as tracks along which motor proteins can travel. Furthermore, they are critical during mitosis and meiosis, as they form the spindle fibers that separate sister chromatids or homologous chromosomes, ensuring accurate distribution of genetic material to daughter cells. In summary, tubulin's primary structural role is centered around its ability to assemble into microtubules, which are vital for cellular architecture and function.

5. What are carbohydrates primarily composed of?

- A. Carbon, Hydrogen and Oxygen**
- B. Nitrogen, Carbon and Oxygen**
- C. Hydrogen, Oxygen and Sulfur**
- D. Carbon, Hydrogen and Nitrogen**

Carbohydrates are organic molecules primarily composed of carbon, hydrogen, and oxygen, with the general chemical formula often represented as $(CH_2O)_n$, where "n" can be any integer. The structure typically consists of a backbone of carbon atoms each bonded to hydrogen and hydroxyl (-OH) groups. The ratio of hydrogen to oxygen in carbohydrates is usually 2:1, similar to that of water, which is a key characteristic of this class of biomolecules. This composition is fundamental to their function and classification, as carbohydrates serve crucial roles in providing energy, structural support in cells, and serving as recognition molecules in biological interactions.

6. During which phase of meiosis does recombination occur?

- A. Prophase I**
- B. Metaphase I**
- C. Prophase II**
- D. Telophase I**

Recombination, also known as crossing over, occurs during Prophase I of meiosis. This phase is critical because homologous chromosomes pair up and exchange genetic material, which increases genetic diversity in the resulting gametes. During Prophase I, the process involves the synapsis of homologous chromosomes, where they align closely, allowing for the exchange of segments between non-sister chromatids. This recombination not only contributes to genetic variation but is also essential for proper chromosome segregation in meiosis. Other phases, such as Metaphase I, Prophase II, and Telophase I, do not involve this process of crossing over. During Metaphase I, homologous chromosome pairs align at the cell equator, but recombination has already occurred. Prophase II is characterized by the preparation of the two haploid cells for a second meiotic division, and Telophase I involves the separation of homologous chromosomes and the formation of new nuclei, without any further recombination. Thus, Prophase I is the only stage where recombination takes place, making it the correct answer.

7. What role do alveoli play in respiration?

- A. They store blood from the heart
- B. They facilitate the exchange of gases**
- C. They detect changes in oxygen levels
- D. They regulate blood flow to the lungs

Alveoli are tiny air sacs located in the lungs, and their primary role in respiration is to facilitate the exchange of gases—specifically, oxygen and carbon dioxide—between the air and the bloodstream. This process occurs through a thin alveolar-capillary membrane, which allows oxygen from inhaled air to diffuse into the blood while carbon dioxide, a metabolic waste product, is expelled from the blood into the alveoli to be exhaled. The structure of alveoli is critical for this function; they have a large surface area due to their numerous presence in the lungs, and they are lined with a thin layer of epithelial cells. This design maximizes efficiency in gas exchange, ensuring that the body receives adequate oxygen to function while removing carbon dioxide effectively. Through this mechanism, alveoli play an essential role in maintaining the body's respiratory needs, supporting cellular metabolism, and overall homeostasis.

8. What type of polysaccharide is mainly found in dietary fiber?

- A. Starch
- B. Cellulose**
- C. Glycogen
- D. Maltose

Dietary fiber primarily consists of cellulose, a type of polysaccharide. Cellulose is a complex carbohydrate made up of long chains of glucose units linked together by β -1,4-glycosidic bonds. Unlike starch and glycogen, which are energy storage forms of glucose in plants and animals respectively, cellulose is not easily digestible by humans, as we lack the necessary enzymes to break down its β -glycosidic linkages. Instead, cellulose passes through the digestive system largely intact, contributing to the bulk of stool and aiding in digestive health. Starch, on the other hand, is a polysaccharide that serves as an energy reserve in plants and can be broken down by human enzymes into glucose. Glycogen is a storage form of glucose in animals and is also not a component of dietary fiber. Maltose is a disaccharide formed from two glucose molecules and does not fit the definition of a polysaccharide. Therefore, cellulose stands out as the primary type of polysaccharide found in dietary fiber.

9. What essential nutrient does the thyroid gland use to produce its hormones?

- A. Calcium**
- B. Sodium**
- C. Iodine**
- D. Iron**

The thyroid gland plays a crucial role in regulating metabolism and other bodily functions through the production of hormones, primarily thyroxine (T4) and triiodothyronine (T3). Iodine is an essential nutrient that the thyroid gland requires for the synthesis of these hormones. When iodine is ingested through the diet, it is absorbed and transported to the thyroid gland, where it is incorporated into the amino acid tyrosine to form T4 and T3. A deficiency in iodine can lead to inadequate hormone production, which may result in conditions such as goiter (enlargement of the thyroid gland) and various forms of hypothyroidism. This underscores the importance of iodine as a dietary component necessary for the optimal functioning of the thyroid gland and overall hormonal balance in the body.

10. What are spinal reflexes primarily characterized by?

- A. Slow and complex actions**
- B. Simple pathways generating rapid muscle contractions**
- C. Involuntary movements requiring brain involvement**
- D. Complex neural pathways requiring sensory inputs**

Spinal reflexes are primarily characterized by simple pathways generating rapid muscle contractions. These reflexes are direct neural circuits that involve sensory neurons, interneurons in the spinal cord, and motor neurons. When a stimulus is detected by sensory receptors, the information is quickly relayed through the sensory neurons to the spinal cord. Here, it may directly activate motor neurons without requiring the involvement of the brain, allowing for instantaneous response and movement, which is a hallmark of reflex actions. The simplicity of this neural pathway is crucial because it enables a rapid protective response, such as pulling away from a painful stimulus, often before the brain is even aware of the situation. This efficiency is essential for survival, allowing organisms to react to dangerous situations swiftly. In contrast, the other options suggest characteristics that do not align with the nature of spinal reflexes. Slow and complex actions, involuntary movements that require brain involvement, and complex neural pathways requiring extensive sensory processing all describe different types of motor activities or neurological functions rather than the rapid and straightforward nature of spinal reflexes.

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://semmelweismedbioentrance.examzify.com>

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

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