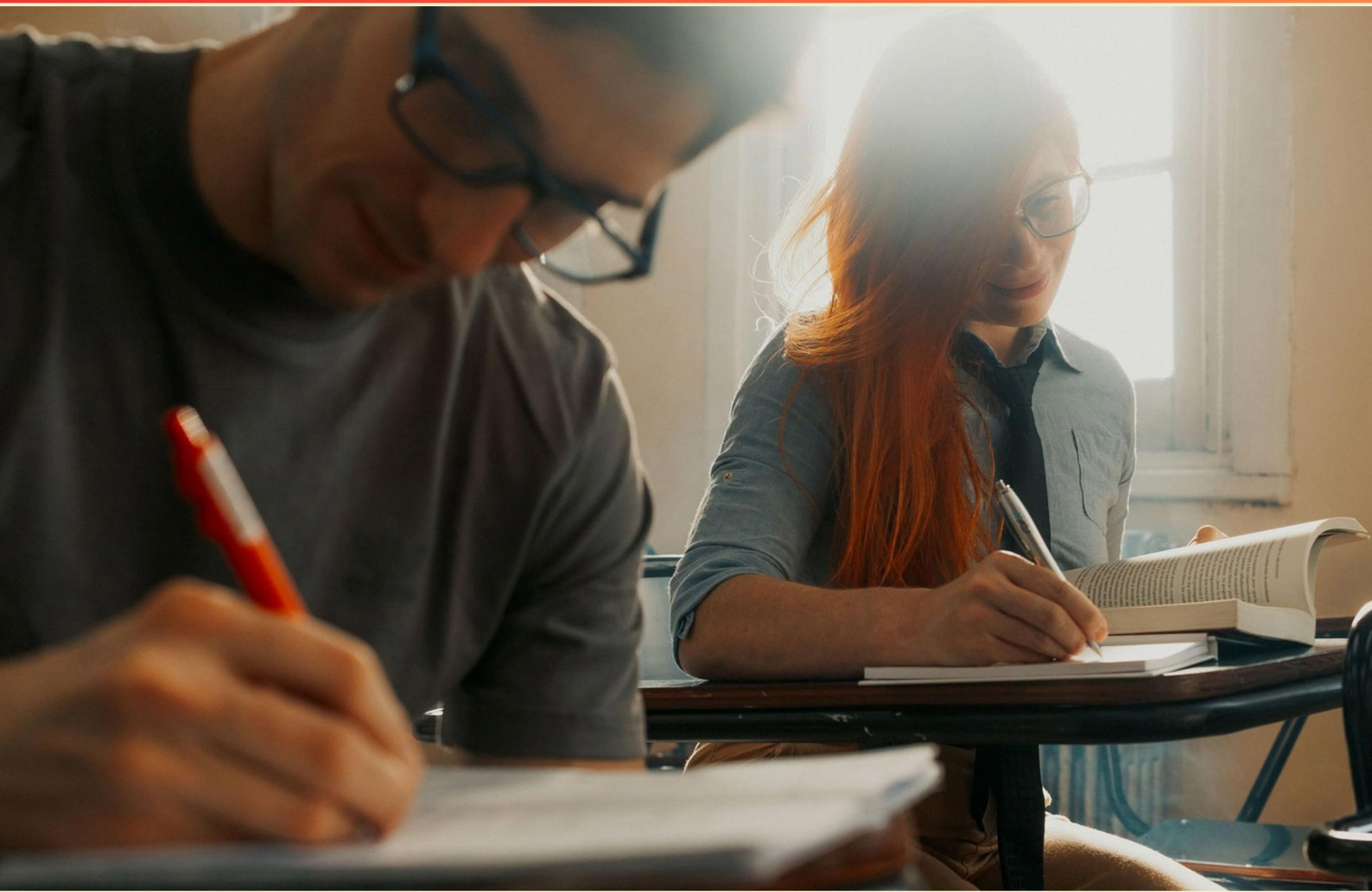


# SEMMELWEIS MEDICINE BIOLOGY ENTRANCE PRACTICE EXAM (SAMPLE)

## 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. What is the first line of defense in the immune system?**
  - A. Inflammation
  - B. Adaptive immunity
  - C. Skin and mucous membranes
  - D. Clotting factors
- 2. What is the function of rRNA in the cell?**
  - A. It acts as a carrier for amino acids
  - B. It encodes genetic information
  - C. It, along with proteins, forms the ribosomes
  - D. It catalyzes biochemical reactions
- 3. Which of the following best describes innate immunity?**
  - A. Specific responses to infections
  - B. Protection based on previous exposure
  - C. Nonspecific defense mechanisms
  - D. Cell-mediated responses only
- 4. How are fats absorbed in the digestive process?**
  - A. Into the bloodstream directly
  - B. Into the lymphatic system
  - C. Into the liver first
  - D. They do not get absorbed
- 5. What components are primarily found in blood?**
  - A. Red blood cells and fatty acids
  - B. Nutrients, antibodies, and hormones
  - C. Minerals and vitamins only
  - D. Only oxygen and carbon dioxide
- 6. What is produced by the enzyme RNA polymerase during transcription?**
  - A. Protein
  - B. Ribosomal RNA
  - C. Messenger RNA
  - D. Transfer RNA

- 7. How does absorption in the digestive system primarily occur?**
- A. Only through osmosis
  - B. Diffusion and facilitated diffusion
  - C. Active transport exclusively
  - D. Evaporation and condensation
- 8. What type of hormones can pass through the cell membrane?**
- A. Peptide hormones
  - B. Amino acid derivatives
  - C. Steroid hormones
  - D. Protein hormones
- 9. What is the primary function of mRNA in cells?**
- A. To store genetic information
  - B. To transfer amino acids to ribosomes
  - C. To encode the amino acid sequence of a polypeptide
  - D. To assist in the processing of ribosomal RNA
- 10. What is the definition of quaternary protein structure?**
- A. The sequential order of amino acids in a single peptide
  - B. The formation of an active site on a protein
  - C. The combination of two or more polypeptides into a functional protein
  - D. The presence of hydrogen bonds stabilizing a protein's shape



## **Answers**

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

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## **Explanations**

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## 1. What is the first line of defense in the immune system?

- A. Inflammation
- B. Adaptive immunity
- C. Skin and mucous membranes**
- D. Clotting factors

The first line of defense in the immune system consists of the skin and mucous membranes. These physical barriers are crucial in preventing pathogens from entering the body. The skin acts as a tough, impermeable barrier, making it difficult for bacteria and viruses to penetrate. Similarly, mucous membranes line various body cavities and secrete mucus, which traps pathogens and other foreign particles. Additionally, these membranes often secrete other protective substances, such as lysozymes, which can break down bacterial cell walls. Other components of the immune system, such as inflammation and adaptive immunity, play significant roles but come into action after the initial barriers are breached. Clotting factors are important for wound healing and preventing blood loss but are not directly involved in the immune defense against pathogens. Therefore, the combination of skin and mucous membranes provides the essential first line of defense in protecting the body from infections.

## 2. What is the function of rRNA in the cell?

- A. It acts as a carrier for amino acids
- B. It encodes genetic information
- C. It, along with proteins, forms the ribosomes**
- D. It catalyzes biochemical reactions

Ribosomal RNA (rRNA) plays a vital role in the cell as a fundamental component of ribosomes, which are the molecular machines responsible for protein synthesis. rRNA not only contributes to the structure of ribosomes but also plays a crucial role in their function. It helps to stabilize the ribosome's overall three-dimensional shape and assists in the binding of messenger RNA (mRNA) and transfer RNA (tRNA) during the translation process. In the ribosome, rRNA works in concert with ribosomal proteins to facilitate the accurate assembly of amino acids into polypeptide chains, thereby synthesizing proteins according to the genetic instructions carried by mRNA. This function is essential for the proper functioning of cells, as proteins perform a vast array of duties, including acting as enzymes, structural components, and signaling molecules. Understanding the role of rRNA in ribosome assembly and protein synthesis is fundamental to comprehending how genetic information is translated into functional biomolecules within the cell.

## 3. Which of the following best describes innate immunity?

- A. Specific responses to infections
- B. Protection based on previous exposure
- C. Nonspecific defense mechanisms**
- D. Cell-mediated responses only

Innate immunity refers to the first line of defense that the body has against pathogens and is characterized by a set of nonspecific defense mechanisms. This means that innate immunity does not target specific pathogens but instead provides a general defense against a wide range of infectious agents. Components of innate immunity include physical barriers like the skin and mucous membranes, as well as immune cells such as macrophages and neutrophils that respond immediately to infection. These components are not tailored to a specific pathogen, which distinguishes innate immunity from adaptive immunity, where the immune response becomes specific to particular pathogens based on prior exposure and memory. Understanding that innate immunity acts rapidly and without the need for prior exposure is key to recognizing its role in protecting the body from a multitude of infectious threats right from the moment of infection. This immediacy and nonspecific nature define innate immunity clearly, making it distinct from the other options presented.

#### 4. How are fats absorbed in the digestive process?

- A. Into the bloodstream directly
- B. Into the lymphatic system**
- C. Into the liver first
- D. They do not get absorbed

Fats are primarily absorbed into the lymphatic system during the digestive process. When dietary fats are consumed, they undergo emulsification by bile salts in the small intestine, which allows pancreatic lipases to break them down into fatty acids and monoglycerides. These products then form micelles, which transport them to the intestinal mucosa for absorption. Inside the intestinal cells, fatty acids and monoglycerides are re-esterified into triglycerides and combined with proteins to form lipoproteins called chylomicrons. These chylomicrons are too large to enter the bloodstream directly, so instead, they are secreted into the lymphatic system. The lymphatic vessels ultimately transport the chylomicrons into the bloodstream via the thoracic duct, where they can be distributed throughout the body for energy or storage. This intricate process is important because it efficiently absorbs and transports fats, which are essential for providing energy, supporting cellular structure, and facilitating the absorption of fat-soluble vitamins.

#### 5. What components are primarily found in blood?

- A. Red blood cells and fatty acids
- B. Nutrients, antibodies, and hormones**
- C. Minerals and vitamins only
- D. Only oxygen and carbon dioxide

Blood is a complex and vital fluid composed of several key components. Among these, nutrients, antibodies, and hormones are significant constituents. Nutrients in the blood, such as glucose, amino acids, and lipids, are essential for providing energy and maintaining cellular functions throughout the body. Antibodies are crucial components of the immune system, helping to identify and neutralize pathogens like bacteria and viruses. Hormones, which are chemical messengers produced by various glands, play vital roles in regulating processes throughout the body, including metabolism, growth, and mood. While red blood cells play a crucial role in transporting oxygen and carbon dioxide, they are not the only components of blood. Fatty acids, vitamins, and minerals are present in blood as well but do not capture the full range of what is primarily found in blood. Therefore, the choice highlighting nutrients, antibodies, and hormones encompasses a broader understanding of the diverse components that contribute to the functionality of blood in the human body.

#### 6. What is produced by the enzyme RNA polymerase during transcription?

- A. Protein
- B. Ribosomal RNA
- C. Messenger RNA**
- D. Transfer RNA

During transcription, RNA polymerase is the key enzyme that synthesizes RNA strands from a DNA template. The primary product of this process is messenger RNA (mRNA), which serves as a template for protein synthesis during translation. RNA polymerase binds to a specific region of the DNA (the promoter) and unwinds the DNA strands to create a transcription bubble. It then catalyzes the formation of a complementary RNA strand by adding nucleotides that are complementary to the DNA template strand. This process results in the formation of mRNA, which carries the genetic information necessary for the synthesis of proteins. While ribosomal RNA and transfer RNA are also produced by RNA polymerase, they are not the primary product of mRNA transcription, which is specifically focused on conveying the code from DNA to construct proteins. Thus, the focus on mRNA highlights its critical role in the gene expression pathway, bridging the gap between DNA and the production of proteins in the cell.

## 7. How does absorption in the digestive system primarily occur?

- A. Only through osmosis
- B. Diffusion and facilitated diffusion**
- C. Active transport exclusively
- D. Evaporation and condensation

The correct answer is focused on diffusion and facilitated diffusion being the primary mechanisms for absorption in the digestive system. In the context of digestion, absorption involves the transfer of nutrients from the lumen of the gastrointestinal tract into the bloodstream. This process relies heavily on passive transport mechanisms. Diffusion allows substances to move from areas of higher concentration to areas of lower concentration without the need for energy, which is efficient for absorbing small molecules like simple sugars and amino acids. Facilitated diffusion is a specific type of diffusion that utilizes carrier proteins in the cell membrane to allow larger or less soluble molecules, such as glucose, to cross the membrane. These processes do not require energy and are crucial in helping the body absorb essential nutrients from the digested food. Active transport, while also important, particularly for the uptake of certain ions and nutrients against their concentration gradients, is not the sole mechanism for absorption. It requires energy in the form of ATP and is therefore not the primary mode for all nutrients. Similarly, osmosis is relevant primarily to the movement of water rather than absorbing all types of nutrients, and evaporation and condensation are processes not involved in nutrient absorption in the digestive system. Understanding these mechanisms is vital for comprehending how nutrients are efficiently taken up from the diet

## 8. What type of hormones can pass through the cell membrane?

- A. Peptide hormones
- B. Amino acid derivatives
- C. Steroid hormones**
- D. Protein hormones

Steroid hormones are unique among the hormone types because of their hydrophobic nature, which allows them to easily pass through the lipid bilayer of cell membranes. Steroid hormones are derived from cholesterol and include hormones such as testosterone, estrogen, and cortisol. Since cell membranes are primarily composed of phospholipid layers, which repel water-soluble substances, the non-polar structure of steroid hormones enables them to diffuse directly across the membrane. Once inside the cell, steroid hormones bind to specific intracellular receptors, thereby influencing gene expression and cellular function. This mechanism of action is different from that of peptide hormones, amino acid derivatives, and protein hormones, which are typically hydrophilic or polarized and cannot pass through the cell membrane without the aid of specific receptors on the cell surface. Instead, they exert their effects by binding to receptors on the cell membrane, leading to second messenger signaling pathways inside the cell.

## 9. What is the primary function of mRNA in cells?

- A. To store genetic information
- B. To transfer amino acids to ribosomes
- C. To encode the amino acid sequence of a polypeptide**
- D. To assist in the processing of ribosomal RNA

mRNA, or messenger RNA, plays a crucial role in the process of protein synthesis by encoding the amino acid sequence of a polypeptide. It serves as a template that carries genetic information from DNA in the nucleus to the ribosomes, where proteins are synthesized. The information contained in mRNA is transcribed from the DNA sequence and specifies the order in which amino acids are linked together in a growing polypeptide chain. During translation, the ribosome reads the codons on the mRNA, which are sets of three nucleotides that correspond to specific amino acids. The ribosome then assembles the polypeptide according to the sequence dictated by the mRNA, resulting in the formation of proteins essential for various cellular functions. This process highlights the importance of mRNA in translating genetic information into functional proteins, enabling cells to perform their necessary tasks.

## 10. What is the definition of quaternary protein structure?

- A. The sequential order of amino acids in a single peptide
- B. The formation of an active site on a protein
- C. The combination of two or more polypeptides into a functional protein**
- D. The presence of hydrogen bonds stabilizing a protein's shape

Quaternary protein structure refers to the way multiple polypeptide chains come together to form a single, functional protein complex. This level of structure is integral for the proper functioning of many proteins, as the interactions between the different polypeptides can affect the overall activity and stability of the protein. In quaternary structure, these individual polypeptides, often referred to as subunits, can be identical or different and can interact through various types of chemical interactions, such as hydrogen bonds, ionic bonds, and hydrophobic interactions. This combination allows for a diverse range of structures and functions in proteins that are crucial for biological processes. For instance, hemoglobin is a well-known example of a protein with quaternary structure, as it consists of four polypeptide chains that work together to transport oxygen in the bloodstream. The other definitions provided do not accurately represent quaternary structure. The first option describes primary structure, which is focused solely on the linear sequence of amino acids in a single peptide. The second option pertains to the concept of an active site, which is more related to the functional aspect of a protein rather than its structural organization. The fourth option describes stabilizing interactions found in secondary and tertiary structures rather than the assembly of multiple polypeptides.

## 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](mailto: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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