

# 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 the function of the Golgi apparatus?**
  - A. Synthesizes DNA**
  - B. Sorts and modifies proteins**
  - C. Transcribes mRNA**
  - D. Produces energy for the cell**
  
- 2. What initiates the hearing mechanism in the outer ear?**
  - A. Vibration of the cochlea**
  - B. Entry of sound waves**
  - C. Expansion of the tympanic membrane**
  - D. Movement of fluid in the inner ear**
  
- 3. What primary action occurs when myosin attaches to actin during muscle contraction?**
  - A. Fibrin breaks down**
  - B. Calcium is released**
  - C. Actin filaments are pulled toward each other**
  - D. Blood vessels dilate**
  
- 4. Turner syndrome is characterized by which chromosomal condition?**
  - A. 47 chromosomes with an extra X**
  - B. 45 chromosomes instead of 46**
  - C. Trisomy 21**
  - D. Two X chromosomes in males**
  
- 5. What type of bonds hold the two strands of a double helix together?**
  - A. Ionic bonds**
  - B. Covalent bonds**
  - C. Hydrogen bonds**
  - D. Disulfide bridges**

- 6. What is fructose commonly known as?**
- A. A sugar used in processed foods**
  - B. A sugar found in fruit and honey**
  - C. A sugar produced by yeast fermentation**
  - D. A sugar that is fully synthetic**
- 7. What is DNA transcription?**
- A. The process of translating mRNA into protein**
  - B. The organic process of copying DNA**
  - C. The organic process of copying a DNA sequence into mRNA**
  - D. The process of protein modification**
- 8. What is a significant structural difference between DNA and RNA?**
- A. RNA lacks uracil while DNA has thymine**
  - B. DNA is single-stranded while RNA is double-stranded**
  - C. RNA contains a ribose sugar while DNA has deoxyribose**
  - D. RNA is less stable than DNA due to more hydrogen bonds**
- 9. Which two monosaccharides form maltose?**
- A. Glucose and fructose**
  - B. Galactose and glucose**
  - C. Glucose and glucose**
  - D. Fructose and galactose**
- 10. What occurs during exhalation in the respiratory process?**
- A. The diaphragm contracts and moves upward**
  - B. The diaphragm expands and moves downward**
  - C. The diaphragm relaxes and allows air to exit**
  - D. The diaphragm stays in a fixed position**

## Answers

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

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## **Explanations**

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## 1. What is the function of the Golgi apparatus?

- A. Synthesizes DNA
- B. Sorts and modifies proteins**
- C. Transcribes mRNA
- D. Produces energy for the cell

The Golgi apparatus is crucial in the post-translational modification, sorting, and packaging of proteins and lipids that have been synthesized in the endoplasmic reticulum. After proteins are produced in the rough endoplasmic reticulum, they are transported to the Golgi apparatus, where they undergo modifications such as glycosylation, phosphorylation, or cleavage. Once these modifications are complete, the Golgi apparatus sorts the proteins and directs them to their appropriate destinations, whether that be secretion outside the cell, incorporation into the cell membrane, or transport to lysosomes. This sorting and modifying function is essential for the proper functioning of the cell, ensuring that proteins are delivered to the right locations and perform their intended roles. In summary, the role of the Golgi apparatus is integral to cellular operations, making the function of sorting and modifying proteins the correct answer.

## 2. What initiates the hearing mechanism in the outer ear?

- A. Vibration of the cochlea
- B. Entry of sound waves**
- C. Expansion of the tympanic membrane
- D. Movement of fluid in the inner ear

The initiation of the hearing mechanism in the outer ear begins with the entry of sound waves. When sound waves travel through the air, they are funneled through the outer ear, specifically the auricle (pinna) and the auditory canal, which helps direct these waves toward the tympanic membrane (eardrum). As the sound waves reach the tympanic membrane, they cause it to vibrate. This vibration is crucial as it sets into motion the subsequent processes in hearing. The outer ear's role is primarily to collect and channel sound waves towards the inner structures of the ear, making the entry of sound waves the very first step in this auditory process. This step is vital for translating acoustic energy into mechanical energy, which eventually leads to the sensation of hearing as the vibrations are transmitted to the inner ear structures.

**3. What primary action occurs when myosin attaches to actin during muscle contraction?**

- A. Fibrin breaks down**
- B. Calcium is released**
- C. Actin filaments are pulled toward each other**
- D. Blood vessels dilate**

The primary action that occurs when myosin attaches to actin during muscle contraction is that actin filaments are pulled toward each other. This process is fundamental to the sliding filament theory of muscle contraction. During contraction, the myosin heads bind to specific sites on the actin filaments, forming cross-bridges. When myosin heads pivot, they pull the actin filaments inward, causing the sarcomere (the basic contractile unit of muscle) to shorten. This pulling action is powered by the hydrolysis of ATP, which releases energy that enables the myosin heads to move and generate force. This mechanism is crucial for the overall contraction of muscle fibers, allowing movement and force generation within the skeletal muscle. It highlights the interaction between these two proteins—myosin and actin—which is central to all types of muscle contractions, including those in cardiac and smooth muscle as well. Understanding this process is key to comprehending how muscles operate at a cellular level.

**4. Turner syndrome is characterized by which chromosomal condition?**

- A. 47 chromosomes with an extra X**
- B. 45 chromosomes instead of 46**
- C. Trisomy 21**
- D. Two X chromosomes in males**

Turner syndrome is a genetic condition that results from the complete or partial absence of one of the two X chromosomes in females. This typically leads to a chromosomal count of 45 chromosomes instead of the usual 46. More specifically, individuals with Turner syndrome often have a karyotype designated as 45,X, meaning they have only one X chromosome and no second sex chromosome (Y or another X). This aneuploid condition is associated with a variety of physical and developmental characteristics, such as short stature, delayed puberty, and various other health concerns. The other options refer to different chromosomal abnormalities. The first option describes a condition known as Klinefelter syndrome, which involves an extra X chromosome. The third option pertains to Down syndrome, characterized by an extra copy of chromosome 21. The last option suggests a typical genetic makeup in males, which does not align with the characteristics of Turner syndrome. Understanding these distinctions is crucial for recognizing how chromosomal variations can lead to different syndromes and health implications.

**5. What type of bonds hold the two strands of a double helix together?**

- A. Ionic bonds**
- B. Covalent bonds**
- C. Hydrogen bonds**
- D. Disulfide bridges**

The strands of a double helix, such as that found in DNA, are held together primarily by hydrogen bonds. These bonds form between the nitrogenous bases of the two strands, where adenine pairs with thymine and guanine pairs with cytosine. The specific pairing allows for the stabilization of the structure while maintaining the flexibility necessary for biological functions such as replication and transcription. Hydrogen bonds are relatively weak compared to other types of bonds; however, the cumulative effect of many such interactions across the length of the DNA molecule contributes to the overall stability of the double helix. This allows the strands to separate easily during processes like DNA replication—crucial for the hereditary transmission of genetic information. While ionic bonds and covalent bonds play significant roles in the DNA structure (for instance, covalent bonds link the sugar and phosphate backbone of each strand), they do not hold the two strands together. Disulfide bridges are relevant in certain protein structures, but they do not pertain to the stability of the DNA double helix.

**6. What is fructose commonly known as?**

- A. A sugar used in processed foods**
- B. A sugar found in fruit and honey**
- C. A sugar produced by yeast fermentation**
- D. A sugar that is fully synthetic**

Fructose is commonly known as a sugar that is naturally found in fruits and honey. This monosaccharide is one of the simplest forms of sugar and is a major component of many fruits, contributing to their sweetness. It is also found in various vegetables and is a part of sucrose, which is table sugar (comprised of glucose and fructose). Fructose is distinctively sweet, and its presence in fruits and honey makes it a natural choice for those seeking to satisfy their sweet cravings while consuming the nutritional benefits of fruits. Its natural sources and role in providing energy enhance its importance in diets as a carbohydrate. While it is referred to as a sugar used in processed foods, such as high-fructose corn syrup, this association does not capture the essence of its natural origins. Other descriptions, like it being produced by yeast fermentation or classified as fully synthetic, do not accurately depict fructose or its most recognized identity. Therefore, the designation of fructose as a sugar found primarily in fruits and honey is the most accurate and widely recognized.

## 7. What is DNA transcription?

- A. The process of translating mRNA into protein
- B. The organic process of copying DNA
- C. The organic process of copying a DNA sequence into mRNA**
- D. The process of protein modification

DNA transcription is the organic process of copying a DNA sequence into mRNA. During transcription, a specific segment of DNA is unwound and serves as a template for creating a complementary RNA strand. This process occurs in the nucleus of eukaryotic cells, where RNA polymerase enzymes attach to the promoter region of a gene, facilitating the synthesis of mRNA based on the nucleotide sequence of the DNA. The significance of transcription lies in its role as the first step of gene expression, where the information encoded in DNA is converted into a format that can be utilized to produce proteins through subsequent processes like translation. This transformation is vital for cellular function and regulation, as it allows cells to respond to changes in their environment and perform various biological processes. This understanding highlights the importance of transcription in the overall framework of genetics and molecular biology, emphasizing its role in bridging the gap between the genetic code and functional proteins.

## 8. What is a significant structural difference between DNA and RNA?

- A. RNA lacks uracil while DNA has thymine
- B. DNA is single-stranded while RNA is double-stranded
- C. RNA contains a ribose sugar while DNA has deoxyribose**
- D. RNA is less stable than DNA due to more hydrogen bonds

The significant structural difference between DNA and RNA lies in the type of sugar present in each molecule. RNA contains ribose sugar, while DNA contains deoxyribose sugar. The presence of an oxygen atom in the ribose sugar (at the 2' carbon) differentiates it from deoxyribose, which lacks this oxygen. This structural distinction is vital as it influences the overall stability and function of the nucleic acids. Ribose makes RNA more reactive and typically less stable than DNA, which is essential for its role in protein synthesis and other cellular processes. In contrast, the deoxyribose in DNA contributes to its stability, allowing it to serve as a long-term storage form of genetic information. This fundamental difference is crucial for understanding the biological roles and behaviors of these two types of nucleic acids.

**9. Which two monosaccharides form maltose?**

- A. Glucose and fructose**
- B. Galactose and glucose**
- C. Glucose and glucose**
- D. Fructose and galactose**

Maltose is a disaccharide that forms from the condensation reaction between two monosaccharide units. Specifically, it is composed of two glucose molecules linked together by an  $\alpha(1\rightarrow4)$  glycosidic bond. This means that the correct combination of monosaccharides to create maltose is indeed two glucose molecules. In the context of the other choices, the other pairings do not yield maltose. For example, glucose and fructose make sucrose, while galactose and glucose produce lactose. Fructose and galactose also do not combine to form maltose. Therefore, the only correct pairing that results in the formation of maltose is that of two glucose units, underscoring the accuracy of the answer.

**10. What occurs during exhalation in the respiratory process?**

- A. The diaphragm contracts and moves upward**
- B. The diaphragm expands and moves downward**
- C. The diaphragm relaxes and allows air to exit**
- D. The diaphragm stays in a fixed position**

During exhalation, the diaphragm relaxes and moves upward into the thoracic cavity, which decreases the volume of the thoracic cavity. This reduction in volume creates an increase in pressure within the lungs compared to the atmospheric pressure, causing air to flow out of the lungs. This process is often passive, primarily driven by the natural elasticity of the lung tissue and the thoracic cavity. The role of the diaphragm during exhalation is crucial. When the diaphragm relaxes, it no longer actively contracts as it does during inhalation, leading to the expulsion of air from the lungs. The movement of the diaphragm is a key factor that differentiates inhalation—where it contracts and moves downward to increase lung volume—from exhalation, where it relaxes and causes air to exit the lungs. This understanding is essential in the context of how the respiratory system operates. Knowing the mechanics of breathing aids in comprehending various respiratory functions and the physiological responses of the body during different states, such as rest or exercise.

## 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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