

Medical College Admission Test (MCAT) 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 formula for work done?**
 - A. Force * distance
 - B. Energy * time
 - C. Pressure * volume displaced
 - D. Mass * acceleration
- 2. What happens to the current through a specific resistor in a parallel circuit when another resistor is removed?**
 - A. It increases
 - B. It decreases
 - C. It remains the same
 - D. It becomes zero
- 3. An increase in temperature favors which side of the reaction for dissociation of acids?**
 - A. The reactants side
 - B. The products side
 - C. It has no effect on the position of equilibrium
 - D. Either side depending on the acid
- 4. In what way do alpha-D glucose and beta-D glucose differ?**
 - A. Different number of carbons
 - B. Hemiacetal carbons have opposite configurations
 - C. Different molecular weights
 - D. Different glycosidic linkages
- 5. What is the effect of a step-up transformer on voltage and current?**
 - A. Increases voltage and current
 - B. Decreases voltage and current
 - C. Increases voltage and decreases current
 - D. Decreases voltage and increases current

- 6. What is the formula used to calculate the just noticeable difference?**
- A. $(\text{Change} / \text{Original}) \times 100$
 - B. $(\text{Original} / \text{Change}) \times 100$
 - C. $(\text{Change} + \text{Original}) \times 100$
 - D. $(\text{Original} - \text{Change}) \times 100$
- 7. What best describes the focus of the biological perspective in psychology?**
- A. Behavior is conditioned by rewards and punishments
 - B. Behavior is a result of mental processing
 - C. Behavior is influenced by genetics and neurobiology
 - D. Behavior is shaped by social interactions
- 8. What physical principle primarily drives air into the lungs during inhalation in mammals?**
- A. Osmosis
 - B. Positive pressure mechanics
 - C. Negative pressure mechanics
 - D. Diffusion
- 9. What is a characteristic of the image in the retina compared to the object viewed?**
- A. Larger and upright
 - B. Smaller and inverted
 - C. Clearer and brighter
 - D. Wider and real
- 10. Which of the following methods could be used to visualize adiabatic processes?**
- A. Pressure vs. time graph
 - B. Volume vs. temperature graph
 - C. Pressure vs. volume graph
 - D. Temperature vs. volume graph

Answers

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

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Explanations

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1. What is the formula for work done?

- A. Force * distance
- B. Energy * time
- C. Pressure * volume displaced**
- D. Mass * acceleration

The formula for work done in physics is derived from the relationship between force and the distance over which that force is applied. Specifically, work is defined as the product of force applied to an object and the distance that the object moves in the direction of that force. Mathematically, this is expressed as: $\text{Work} = \text{Force} \times \text{Distance}$. In this context, force is measured in newtons and distance in meters, resulting in work measured in joules. This conceptual framework highlights that work is performed when a force causes displacement. Option C, which states pressure times volume displaced, relates to work done in a specific thermodynamic context (such as pressure-volume work in gases), but it does not represent the general formula for mechanical work. The other options, energy times time and mass times acceleration, also do not align with the standard definition of work in physics. The correct understanding focuses on the direct relationship between force and displacement as the fundamental basis for calculating work done.

2. What happens to the current through a specific resistor in a parallel circuit when another resistor is removed?

- A. It increases
- B. It decreases
- C. It remains the same**
- D. It becomes zero

In a parallel circuit, each resistor is connected across the same two points and thus experiences the same voltage across it. The total current in the circuit is the sum of the currents through each parallel branch. When one resistor is removed from a parallel circuit, the overall resistance of the circuit increases, which typically leads to a reduction in total current supplied by the voltage source. However, the current flowing through the remaining resistors does not change as a direct result of removing one resistor. This is because the voltage across each remaining resistor remains constant, determined by the voltage of the source. Therefore, using Ohm's Law ($V = IR$), the current through each remaining resistor will stay the same. Consequently, when another resistor is removed from a parallel circuit, the current through the specific remaining resistor remains unchanged, as it continues to experience the same voltage while its resistance has not altered. Thus, the answer that asserts the current remains the same is indeed correct.

3. An increase in temperature favors which side of the reaction for dissociation of acids?

- A. The reactants side
- B. The products side**
- C. It has no effect on the position of equilibrium
- D. Either side depending on the acid

When considering the dissociation of acids in an equilibrium reaction, an increase in temperature can influence the position of equilibrium according to Le Chatelier's principle. This principle states that if a change in conditions is applied to a system at equilibrium, the system will adjust in a way that counteracts that change. In the case of acid dissociation reactions, the process is often endothermic, meaning that it absorbs heat when the acid dissociates into its ions. Therefore, when the temperature increases, the system shifts to favor the products side of the reaction in order to absorb that additional heat. This results in a greater concentration of the dissociated ions in solution. For example, if we consider a general acid dissociation reaction: $HA(aq) \rightleftharpoons H^+(aq) + A^-(aq)$. An increase in temperature promotes the formation of H^+ and A^- ions, thereby favoring the products side of the equilibrium. This understanding aligns with how temperature impacts reactions involving heat exchange, illustrating that temperature changes can significantly affect the outcome of acid dissociation reactions.

4. In what way do alpha-D glucose and beta-D glucose differ?

- A. Different number of carbons
- B. Hemiacetal carbons have opposite configurations**
- C. Different molecular weights
- D. Different glycosidic linkages

Alpha-D glucose and beta-D glucose differ in the configuration of the hemiacetal carbon. Specifically, this is the carbon atom that is formed when the carbonyl group ($C=O$) of the open-chain form of glucose reacts with a hydroxyl group ($-OH$) on the same molecule, resulting in a cyclic structure. In alpha-D glucose, the hydroxyl group attached to the anomeric carbon (the hemiacetal carbon) is positioned below the plane of the ring, while in beta-D glucose, the hydroxyl group is above the plane of the ring. This positional difference creates two distinct anomers of glucose, which can exhibit different chemical and biological properties. The molecular formula for both forms remains the same ($C_6H_{12}O_6$), which means they have identical molecular weights, and they also contain the same number of carbons. Furthermore, glycosidic linkages, which are formed when monosaccharides join together to create disaccharides or polysaccharides, can involve either form of glucose, thus not representing a fundamental difference between alpha-D and beta-D glucose themselves.

5. What is the effect of a step-up transformer on voltage and current?

- A. Increases voltage and current
- B. Decreases voltage and current
- C. Increases voltage and decreases current**
- D. Decreases voltage and increases current

A step-up transformer is a device used in electrical circuits to increase the voltage from the primary coil to the secondary coil. This is achieved through the principle of electromagnetic induction, where the transformer consists of two coils of wire wound around a core. In a step-up transformer, there are more turns in the secondary coil than in the primary coil. The important relationship governing transformers is given by the equation: $\frac{V_s}{V_p} = \frac{N_s}{N_p}$ where V_s is the secondary voltage, V_p is the primary voltage, N_s is the number of turns in the secondary coil, and N_p is the number of turns in the primary coil. As the number of turns in the secondary coil increases (in a step-up transformer), the voltage in the secondary increases relative to the primary. However, the power supplied to the transformer remains constant (ideally, ignoring losses), which is articulated by the equation: $V_p \cdot I_p = V_s \cdot I_s$ where I_p is the primary current and I_s is the secondary current. As the voltage

6. What is the formula used to calculate the just noticeable difference?

- A. (Change / Original) x 100**
- B. (Original / Change) x 100
- C. (Change + Original) x 100
- D. (Original - Change) x 100

The formula used to calculate the just noticeable difference (JND) is indeed (Change / Original) x 100. This formula is based on the principle of comparing the change in stimulus intensity relative to the original stimulus intensity. The just noticeable difference represents the minimum amount of change in a stimulus that can be detected. By expressing this change as a percentage of the original stimulus, the formula allows us to understand how noticeable a difference is based on the context of the original stimulus level. This concept is rooted in Weber's Law, which states that the JND is a constant proportion of the original stimulus. Therefore, when determining how much change is needed to perceive a difference, it is crucial to relate it back to the original level of the stimulus. This approach helps researchers and psychologists quantify sensory perceptions and understand how individuals experience changes in various stimuli, whether it be light, sound, weight, or other sensory inputs.

7. What best describes the focus of the biological perspective in psychology?

- A. Behavior is conditioned by rewards and punishments
- B. Behavior is a result of mental processing
- C. Behavior is influenced by genetics and neurobiology**
- D. Behavior is shaped by social interactions

The biological perspective in psychology emphasizes that behavior is significantly influenced by genetics and neurobiology. This perspective posits that the physiological processes within the body, including brain structure, neurotransmitter function, and genetic predispositions, all play crucial roles in shaping how we think, feel, and behave. Research in this area often examines how various biological factors, such as hormones, brain chemistry, and heredity, contribute to psychological phenomena. For instance, studies might look at how imbalances in neurotransmitters can affect mood or how genetic variations can predispose individuals to certain psychological conditions. This focus on biology helps to establish a scientific basis for understanding behaviors and mental processes, integrating findings from fields such as neuroscience, genetics, and evolutionary psychology. Thus, option C encapsulates the essence of the biological perspective by highlighting the roles of genetic makeup and neurobiological processes in determining behavior.

8. What physical principle primarily drives air into the lungs during inhalation in mammals?

- A. Osmosis
- B. Positive pressure mechanics
- C. Negative pressure mechanics**
- D. Diffusion

During mammalian inhalation, the primary physical principle at work is negative pressure mechanics. This process involves the diaphragm and intercostal muscles contracting, which increases the volume of the thoracic cavity. As the volume increases, the pressure within the lungs decreases relative to atmospheric pressure. According to Boyle's law, when the volume of a gas increases, its pressure decreases. Consequently, when the lung volume expands, the pressure inside the lungs becomes lower than that of the outside atmosphere. This pressure gradient causes air to flow into the lungs from the surrounding environment, moving from an area of higher pressure to one of lower pressure. This inhalation mechanism is efficient and pivotal for respiration in mammals, allowing them to oxygenate their blood. Negative pressure mechanics is a fundamental concept in respiratory physiology, distinguishing mammalian breathing from other methods that might rely on mechanisms such as positive pressure, which is not characteristic of standard mammalian inhalation.

9. What is a characteristic of the image in the retina compared to the object viewed?

- A. Larger and upright
- B. Smaller and inverted**
- C. Clearer and brighter
- D. Wider and real

The image formed on the retina is characterized by being smaller and inverted compared to the object that is being viewed. This phenomenon occurs because of the optical properties of the eye, where light rays pass through the cornea and lens, which converge the light onto the retina. As objects are much larger than the retina itself, the image projected on the retina is a scaled-down version of the actual object, resulting in a smaller image. Additionally, the optics of the eye cause the image to be flipped upside down (inverted). This is a crucial aspect of how our visual system processes images; the brain interprets the inverted signals and adjusts our perception so that we see the world right-side up. The characteristics provided in other options do not accurately reflect the properties of the retinal image. Understanding this inversion and reduction in size is fundamental in grasping basic optics in physiology, especially in relation to human vision.

10. Which of the following methods could be used to visualize adiabatic processes?

- A. Pressure vs. time graph
- B. Volume vs. temperature graph
- C. Pressure vs. volume graph**
- D. Temperature vs. volume graph

To visualize adiabatic processes, a pressure vs. volume graph is particularly effective because it directly represents the relationship between pressure and volume during a thermodynamic process. In an adiabatic process, there is no heat exchange with the surroundings, which results in specific changes in pressure and volume. On such a graph, adiabatic processes can be represented as curves where each point indicates a state of the system. These curves are typically steeper than isothermal curves because, during an adiabatic expansion or compression, the temperature changes as a result of work done on or by the gas, affecting the pressure and volume accordingly. Understanding this relationship is key for visualizing how gases behave under adiabatic conditions, as it provides insights into the work done by or on the system, and the resulting temperature changes without heat exchange. Thus, the pressure vs. volume graph serves as a vital tool in thermodynamics for representing adiabatic processes effectively and intuitively.

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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:

<https://medicalcollegeadmissiontest.examzify.com>

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

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