HUMBER ADMISSIONS PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Table of Contents

Copyright 1
Table of Contents 2
Introduction 3
How to Use This Guide 4
Questions 5
Answers 8
Explanations 10
Next Steps 15

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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.

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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!

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Questions

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1. According to the Pauli Exclusion Principle, how many electrons can occupy an atomic orbital?

A. One, with any spin

B. Two, with opposite spin direction

C. Only those of the same spin direction

D. Zero, no electrons can occupy it

2. What defines a polar covalent bond?

A. Atoms have equal electronegativity

B. Electrons are pulled equally between two atoms

C. Atoms differ in electronegativity, resulting in unequal sharing of electrons

D. Electrons are completely transferred

3. Which factors influence reaction rates?

A. Nature of reactants only

B. Concentration and temperature only

C. Surface area and catalysts only

D. Nature of reactants, concentration, surface area, presence of catalysts, and temperature

4. What type of chemical reaction occurs when two compounds exchange ions or atoms resulting in the formation of a gas, solid precipitate, or molecular compound?

A. Oxidation Reaction

B. Double-Displacement Reaction

C. Combustion Reaction

D. Synthesis Reaction

5. Which base pairs with thymine in DNA?

A. Cytosine

B. Adenine

C. Guanine

D. Uracil

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6. How many forms of alleles does a heterozygous organism possess?

A. Zero

B. One

C. Two

D. Three

7. What is a combination reaction?

A. A reaction producing two new substances

B. A reaction that forms a single new substance from multiple reactants

C. A reaction where a compound breaks down into simpler substances

D. A reaction where one element displaces another

8. Which type of relationship is defined by one variable increasing as another also increases?

A. Inverse relationship

B. Direct relationship

C. Proportional relationship

D. Dependent relationship

9. What does the orbital quantum number represent?

A. The main energy level

B. The shape of the orbital

C. The total number of electrons

D. The type of element

10. What is the only base that pairs with adenine in DNA?

A. Uracil

B. Guanine

C. Cytosine

D. Thymine

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Answers

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

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Explanations

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1. According to the Pauli Exclusion Principle, how many electrons can occupy an atomic orbital?

A. One, with any spin

B. Two, with opposite spin direction

C. Only those of the same spin direction

D. Zero, no electrons can occupy it

The Pauli Exclusion Principle states that no two electrons in an atom can have the same set of quantum numbers. This principle implies that an atomic orbital can hold a maximum of two electrons, but they must have opposite spin direction. In atomic physics, electrons are described by four quantum numbers, which collectively define their unique state within an atom. Since two electrons can occupy the same orbital, they must differ in at least one of these quantum numbers—specifically, in their spin quantum number, which can be either +1/2 or -1/2. Therefore, the correct understanding of how many electrons can occupy an atomic orbital, within the guidance of the Pauli Exclusion Principle, is that it can accommodate two electrons with opposite spins. This arrangement enables the electrons to coexist in the same orbital while adhering to the exclusions posed by their quantum states.

2. What defines a polar covalent bond?

A. Atoms have equal electronegativity

B. Electrons are pulled equally between two atoms

C. Atoms differ in electronegativity, resulting in unequal sharing of electrons

D. Electrons are completely transferred

A polar covalent bond is characterized by the unequal sharing of electrons between two atoms that have different electronegativity values. Electronegativity refers to an atom's ability to attract and hold electrons. When two atoms form a bond and have significant differences in their electronegativity, the atom with the higher electronegativity will attract the shared electrons more strongly. This unequal attraction causes a partial positive charge on one atom and a partial negative charge on the other, leading to a dipole moment in the molecule. This distinction in electron distribution is what makes the bond polar, as opposed to non-polar covalent bonds where electrons are shared equally due to similar electronegativity values. Additionally, fully transferring electrons between two atoms defines ionic bonds, not polar covalent bonds, which emphasizes the uniqueness of polar covalent interactions.

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3. Which factors influence reaction rates?

A. Nature of reactants only

B. Concentration and temperature only

C. Surface area and catalysts only

D. Nature of reactants, concentration, surface area, presence of catalysts, and temperature

The correct choice encompasses a comprehensive range of elements that significantly affect reaction rates. Understanding these factors is paramount in chemistry, as each plays a crucial role in how fast or slow a reaction proceeds. The nature of reactants refers to the specific characteristics of the substances involved in the reaction, including their physical state (solid, liquid, gas), bond strengths, and chemical properties. These attributes determine how effectively reactants can collide and interact, impacting the speed of the reaction. Concentration indicates the amount of a substance present in a given volume. Higher concentrations typically lead to more frequent collisions between reactant particles, thereby increasing the likelihood of reaction and reducing the time taken for the reaction to occur. Surface area is particularly relevant for solid reactants. Finely divided solids provide more area for reactions to take place, increasing contact between reactants and enhancing the reaction rate. This is why powdered substances often react faster than larger chunks. The presence of catalysts can dramatically alter reaction rates. Catalysts provide an alternative pathway for the reaction with a lower activation energy, enabling the reaction to occur more quickly without being consumed in the process. Temperature also plays a critical role. Increasing temperature generally results in higher kinetic energy for the reactants, leading to more collisions and a greater likelihood

4. What type of chemical reaction occurs when two compounds exchange ions or atoms resulting in the formation of a gas, solid precipitate, or molecular compound?

A. Oxidation Reaction

B. Double-Displacement Reaction

C. Combustion Reaction

D. Synthesis Reaction

The process described involves two compounds undergoing a transformation where they exchange ions or atoms. This type of reaction is characteristic of double-displacement reactions, which are also known as metathesis reactions. During these reactions, the components of the reactants switch partners, leading to a new arrangement of ions. A defining feature of double-displacement reactions is their potential to produce a gas, a solid precipitate, or a molecular compound as one of the products. For instance, when an aqueous solution of silver nitrate reacts with sodium chloride, they exchange ions to form sodium nitrate and solid silver chloride, which precipitates out of the solution. This distinguishes double-displacement reactions from other types, such as oxidation reactions, which involve the transfer of electrons and changes in oxidation states, or combustion reactions, which primarily involve the rapid reaction of a substance with oxygen to produce heat and light. Synthesis reactions, on the other hand, typically involve the combination of simpler substances to form a more complex compound, rather than exchanging components between two compounds. Thus, the correct identification of double-displacement reactions is key to understanding the dynamics of chemical interactions involving ionic compounds.

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5. Which base pairs with thymine in DNA?

A. Cytosine

B. Adenine

C. Guanine

D. Uracil

Thymine is one of the four nucleotide bases found in DNA, and it specifically pairs with adenine through hydrogen bonding. In the double helix structure of DNA, thymine and adenine are complementary bases, meaning that they fit together to stabilize the structure of the DNA molecule. This pairing is essential for the processes of DNA replication and transcription, where the accurate transmission of genetic information relies on these specific base pairings. Adenine has a double bond with thymine, forming A-T pairs. This is a foundational concept in molecular biology that underpins the mechanisms of heredity and gene expression. Understanding this base pairing is critical as it demonstrates the rules of complementary base pairing that dictate the integrity of genetic information.

6. How many forms of alleles does a heterozygous organism possess?

A. Zero

B. One

C. Two

D. Three

A heterozygous organism possesses two different forms of alleles for a particular gene. In genetics, alleles are variations of a gene that can produce different traits. When an organism is described as heterozygous, it means it has inherited two different versions of a gene—one from each parent. For instance, if we consider a gene that determines flower color, one allele might code for red flowers while another codes for white flowers. In the case of a heterozygous plant, it carries both the red and white alleles, resulting in a mix of traits that may produce a phenotype that is distinct from both homozygous conditions (where both alleles are the same). Therefore, the presence of two distinct alleles is what defines a heterozygous state, making it possible for the organism to express a dominant trait or, in some cases, a combination of traits. Other answer choices do not align with the definition of heterozygous. Zero, one, and three do not reflect the key concept that a heterozygous individual specifically possesses two different alleles for the same gene.

7. What is a combination reaction?

A. A reaction producing two new substances

B. A reaction that forms a single new substance from multiple reactants

C. A reaction where a compound breaks down into simpler substances

D. A reaction where one element displaces another

A combination reaction is characterized by the formation of a single new substance from two or more reactants. In this type of reaction, the reactants, which can be elements or compounds, combine together to create one distinct product. This is often represented by a balanced chemical equation where the total number of atoms of each element is conserved, ensuring that the mass is balanced on both sides of the equation. For instance, when hydrogen gas combines with oxygen gas, they form water, which is a single new substance. This clear transformation from multiple reactants into one product is the hallmark of combination reactions, distinguishing them from other types of chemical reactions such as decomposition, where a single compound breaks down into simpler substances, or displacement reactions, where one element replaces another in a compound.

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8. Which type of relationship is defined by one variable increasing as another also increases?

A. Inverse relationship

B. Direct relationship

C. Proportional relationship

D. Dependent relationship

A direct relationship is characterized by a situation where two variables move in the same direction; as one variable increases, the other variable also increases. This concept can be visualized using a graph where the points generally trend upwards, indicating that higher values in one variable correspond to higher values in the other. In a direct relationship, the variables are positively correlated, which means that the increase in one variable results in a predictable increase in the other. This consistency allows for easier predictions and understanding of how changes affect the overall relationship between the two variables. In contrast, an inverse relationship would describe a situation where one variable increases while the other decreases, and a proportional relationship implies a constant ratio between the two variables rather than just a simple direction of change. A dependent relationship indicates that one variable depends on another, but it does not specifically address the direction of the change. Thus, the definition of a direct relationship effectively captures the essence of the scenario presented in the question, making it the correct choice.

9. What does the orbital quantum number represent?

A. The main energy level

B. The shape of the orbital

C. The total number of electrons

D. The type of element

The orbital quantum number, also known as the azimuthal quantum number, specifically represents the shape of the orbital in which an electron can be found. This quantum number is designated by the letter "l" and can take on integer values from 0 up to n-1, where "n" is the principal quantum number associated with the main energy level. Each value of the orbital quantum number corresponds to a different orbital shape: for instance, when l=0, it indicates an s orbital which is spherical; l=1 corresponds to a p orbital which has a dumbbell shape; l=2 corresponds to a d orbital which has a more complex shape, and so on. Therefore, understanding the orbital quantum number is essential for visualizing the arrangement and the spatial distribution of electrons around the nucleus of an atom.

10. What is the only base that pairs with adenine in DNA?

A. Uracil

B. Guanine

C. Cytosine

D. Thymine

In the structure of DNA, adenine is a purine that specifically pairs with thymine, a pyrimidine, through hydrogen bonds. This pairing is crucial for the formation of the double helix structure of DNA, allowing for the complementary base pairing that ensures accurate DNA replication and transcription processes. The pairing between adenine and thymine involves two hydrogen bonds, which helps stabilize the DNA molecule. This complimentary pairing is fundamental to the overall structure and function of DNA, as it supports the genetic code and the mechanisms involved in cell division and protein synthesis. Other bases, such as uracil, guanine, and cytosine, do not pair with adenine in DNA. In fact, uracil replaces thymine in RNA, and while guanine pairs with cytosine in both DNA and RNA, they do not form pairs with adenine. Therefore, the only base that specifically pairs with adenine in DNA is thymine.

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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:

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

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