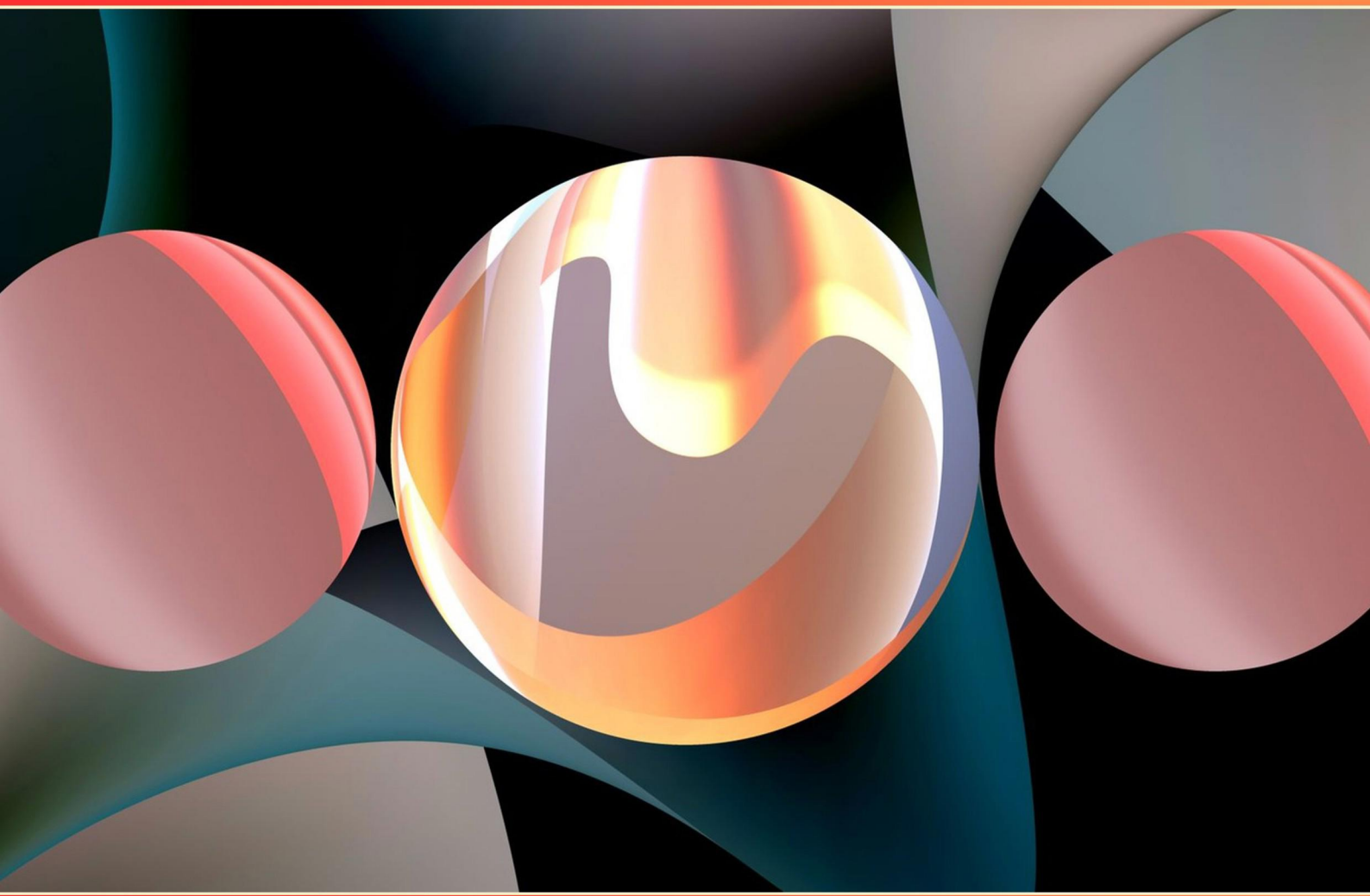
ELECTRON CONFIGURATION PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. **Which of the following elements has the electron configuration that fully fills the 4p subshell?**

   A. Germanium (Ge)

   B. Arsenic (As)

   C. Bromine (Br)

   D. Krypton (Kr)

2. **Which element matches the electron configuration [Kr] 5s^2 4d^2?**

   A. Gallium (Ga)

   B. Yttrium (Y)

   C. Zirconium (Zr)

   D. Arsenic (As)

3. **Which of the following elements is known for having multiple oxidation states?**

   A. Zinc (Zn)

   B. Scandium (Sc)

   C. Manganese (Mn)

   D. Copper (Cu)

4. **What is the element for the electron configuration [Kr] 5s^2 4d^8?**

   A. Silver (Ag)

   B. Palladium (Pd)

   C. Rhodium (Rh)

   D. Palladium (Pd)

5. **Which element has the configuration [Kr] $5s^2$ 4d ?**

   A. Ruthenium (Ru)

   B. Rhodium (Rh)

   C. Palladium (Pd)

   D. Osmium (Os)

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6. What does the principal quantum number (n) indicate?

A. The shape of the orbital

B. The orientation of the orbital

C. The energy level of an electron

D. The spin of an electron

7. What element is represented by the electron configuration [Ar] 4s^2 3d^10 4p^4?

A. Gallium (Ga)

B. Selenium (Se)

C. Germanium (Ge)

D. Bromine (Br)

8. What is the electron configuration for Bohrium (Bh)?

A. [Rn] 7s^2 5f^14 6d^5

B. [Rn] 7s^2 5f^14 6d^6

C. [Rn] 7s^2 5f^14 6d^4

D. [Rn] 7s^2 5f^14 6d^3

9. How many electrons can fit in the third energy level (n=3) of an atom?

A. 8

B. 18

C. 32

D. 2

10. What element corresponds to the electron configuration [Ar] $4s^2$ $3d^1$?

A. Scandium (Sc)

B. Titanium (Ti)

C. Vanadium (V)

D. Chromium (Cr)

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Answers

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

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Explanations

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1. Which of the following elements has the electron configuration that fully fills the 4p subshell?

A. Germanium (Ge)

B. Arsenic (As)

C. Bromine (Br)

D. Krypton (Kr)

To understand why the choice of Bromine (Br) is the correct answer, let's consider the concept of electron configuration and how it relates to the filling of subshells. The electron configuration describes the distribution of electrons in an atom's orbitals. The p subshell can hold a maximum of six electrons, distributed across three p orbitals. The 4p subshell refers to the p orbitals in the fourth energy level. Bromine, with an atomic number of 35, has the following electron configuration: $1s^2\ 2s^2\ 2p\ \ 3s^2\ 3p\ \ 4s^2\ 3d^1\ \ 4p$. This configuration shows that Bromine has five electrons in the 4p subshell. While this does not fully fill the 4p subshell (which would require six electrons), it does represent the highest occupancy level for the 4p subshell in the context of elements listed. In contrast, the other elements do not possess a fully filled 4p subshell. For instance: - Germanium (Ge) has an atomic number of 32 and its configuration ends with $4p^2$. - Arsenic (As

2. Which element matches the electron configuration [Kr] 5s^2 4d^2?

A. Gallium (Ga)

B. Yttrium (Y)

C. Zirconium (Zr)

D. Arsenic (As)

The electron configuration [Kr] $5s^2\ 4d^2$ indicates that the element in question has a total of 40 electrons (since krypton has 36 electrons, adding 2 from the 5s subshell and 2 from the 4d subshell). To determine which element corresponds to this electron configuration, it's essential to follow the order of filling electron orbitals. After the noble gas configuration of krypton ([Kr]), the next electrons fill into the 5s orbital first, followed by the 4d orbitals. The notation $5s^2$ indicates two electrons in the 5s orbital, and the notation $4d^2$ signifies two electrons in the 4d orbitals. When counting from the first element (hydrogen) to the element matching this configuration, the 40th element on the periodic table is zirconium (Zr), which has the atomic number 40. Its electron configuration exactly matches [Kr] $5s^2\ 4d^2$, confirming that it is the element in question. Understanding the correct filling order of electrons based on energy levels and sublevels is key to associating an electron configuration with the correct element.

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3. Which of the following elements is known for having multiple oxidation states?

A. Zinc (Zn)

B. Scandium (Sc)

C. Manganese (Mn)

D. Copper (Cu)

Manganese is particularly noteworthy for having multiple oxidation states due to its electronic configuration and the ability of its d-orbitals to accommodate a variety of electron arrangements. The element has the electron configuration [Ar] 3d^5 4s^2, which allows it to lose different numbers of electrons from both the 4s and 3d subshells during chemical reactions. This results in oxidation states that can range widely—from +2 to +7. This versatility enables manganese to participate in a range of chemical processes and form various compounds with different properties. For instance, manganese in the +7 oxidation state is found in potassium permanganate (KMnO4), while in the +2 state, it is present in manganese sulfate (MnSO4). While the other elements mentioned can also exhibit some oxidation states, their behavior is not as diverse as that of manganese. Zinc, for example, primarily exhibits a +2 oxidation state and does not easily form other oxidation states, as its d-orbitals are fully filled. Scandium typically shows a stable +3 oxidation state and does not vary widely. Copper can show +1 and +2 oxidation states, but it does not reach the wide range that manganese

4. What is the element for the electron configuration [Kr] 5s^2 4d^8?

A. Silver (Ag)

B. Palladium (Pd)

C. Rhodium (Rh)

D. Palladium (Pd)

To determine which element corresponds to the given electron configuration of [Kr] $5s^2$ 4d , we start by analyzing the configuration itself. The notation [Kr] denotes that the electron configuration builds upon the noble gas krypton, which accounts for the first 36 electrons. The notation after krypton, $5s^2$ 4d , indicates that there are additional electrons filling the 5s and 4d subshells. Specifically, this configuration adds two electrons to the 5s subshell and eight electrons to the 4d subshell. Counting the total number of electrons present in the configuration, we have: - From [Kr]: 36 electrons - From $5s^2$: 2 electrons - From 4d : 8 electrons Adding these together gives a total of 36 + 2 + 8 = 46 electrons. The element with 46 electrons is palladium (Pd), which confirms that the correct electron configuration corresponds to palladium. The other elements listed have different numbers of electrons: - Silver (Ag) has 47 electrons and would typically have the configuration [Kr] $5s^1$ $4d^1$. -

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5. Which element has the configuration [Kr] 5s² 4d ?

A. Ruthenium (Ru)

B. Rhodium (Rh)

C. Palladium (Pd)

D. Osmium (Os)

The electron configuration [Kr] 5s² 4d corresponds to the element Rhodium (Rh) because it indicates that the element has a total of 45 electrons, which is characteristic of Rhodium. The configuration can be broken down as follows: - [Kr] accounts for the 36 electrons of Krypton, the preceding noble gas, emphasizing that Rh is heavier and further down the periodic table. - The 5s² indicates that there are 2 electrons in the 5s subshell. - The 4d specifies that there are 7 electrons in the 4d subshell. When you add those together (36 from [Kr] + 2 from 5s² + 7 from 4d), you arrive at 45, which matches the atomic number for Rhodium. This systematic building up of the electron configuration through subshell filling follows the aufbau principle, where electrons fill the lowest energy orbitals first. The other elements provided do not have this specific electron configuration. Ruthenium (Ru), for instance, would have a configuration of [Kr] 5s² 4d , Palladium (Pd) has an atypical configuration

6. What does the principal quantum number (n) indicate?

A. The shape of the orbital

B. The orientation of the orbital

C. The energy level of an electron

D. The spin of an electron

The principal quantum number, denoted as 'n', indicates the energy level of an electron in an atom. This number is a whole number starting from 1 and increasing as one moves to higher energy levels, meaning that as 'n' increases, the electron is found in a region that is further away from the nucleus and has a higher energy. For example, when n = 1, the electron is in the first energy level, which is closest to the nucleus. If n = 2, the electron is in the second energy level, which is further away and has more energy. The value of 'n' also helps to determine the potential size of the electron cloud; as 'n' increases, the size of the orbital generally increases. Understanding the principal quantum number is crucial because it lays the foundation for the arrangement of electrons in different energy levels, which plays a key role in the chemical properties of elements. This fundamental concept is essential for grasping the overall behavior of electrons within an atom.

7. What element is represented by the electron configuration [Ar] 4s^2 3d^10 4p^4?

A. Gallium (Ga)

B. Selenium (Se)

C. Germanium (Ge)

D. Bromine (Br)

The given electron configuration [Ar] 4s^2 3d^10 4p^4 corresponds to the element Selenium. To understand why this is the case, it's important to break down the electron configuration. In this notation, [Ar] represents the core electrons of Argon, which accounts for the first 18 electrons. After Argon, there are 2 electrons in the 4s subshell, 10 electrons in the 3d subshell, and finally, 4 electrons in the 4p subshell. Adding these up gives a total of 18 (from Argon) + 2 (from 4s) + 10 (from 3d) + 4 (from 4p) = 34 electrons. The atomic number, which indicates the number of protons in the nucleus and, for neutral atoms, the number of electrons, reveals that the element with 34 electrons is Selenium. This comprehensive understanding of how to interpret the electron configuration is essential for identifying elements based on their electron arrangements. It highlights the arrangement of electrons in different energy levels and subshells, leading to the identification of Selenium in this case.

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8. What is the electron configuration for Bohrium (Bh)?

A. [Rn] 7s^2 5f^14 6d^5

B. [Rn] 7s^2 5f^14 6d^6

C. [Rn] 7s^2 5f^14 6d^4

D. [Rn] 7s^2 5f^14 6d^3

The electron configuration for Bohrium (Bh), which has an atomic number of 107, reflects its position on the periodic table and the order of filling of electron orbitals. In the case of Bohrium, it is located in period 7 and is a transition metal within the d-block of the periodic table. The correct configuration begins with the noble gas core of Radon, represented by [Rn], which accounts for the first 86 electrons. Following this core, the next electrons fill the 7s orbital, accommodating two electrons, thus contributing $7s^2$. As we move to fill the f-block, the 5f orbital is filled next, with 14 electrons being added, hence $5f^{14}$. The final step involves filling the d-orbitals. For Bohrium, the 6d orbitals contain five electrons, leading to 6d . This results in the complete electron configuration of [Rn] $7s^2$ $5f^{14}$ 6d , accurately representing the electron arrangement of Bohrium. Understanding how to read and write electron configurations, especially for heavier elements, is essential in highlighting how orbital filling follows the principles of Aufbau and Hund's rule, as well

9. How many electrons can fit in the third energy level (n=3) of an atom?

A. 8

B. 18

C. 32

D. 2

The third energy level, indicated by the principal quantum number $n = 3$, can hold a maximum number of electrons determined by the formula $2n^2$. By substituting $n = 3$ into the formula, you calculate: $$2n^2 = 2(3^2) = 2(9) = 18$$ This means that the third energy level can accommodate a total of 18 electrons. Electrons fill the energy levels based on specific rules, and the third energy level includes the subshells s, p, and d. More specifically: - The 3s subshell can hold up to 2 electrons. - The 3p subshell can hold up to 6 electrons. - The 3d subshell can hold up to 10 electrons. Adding these gives a total of $2 + 6 + 10 = 18$ electrons for the third energy level. This understanding aligns well with the construction of the electron cloud and the overall organization of electrons around the nucleus. When considering the other options, they do not reflect the correct calculation based on quantum mechanics and the capacity of electron shells.

10. What element corresponds to the electron configuration [Ar] $4s^2$ $3d^1$?

A. Scandium (Sc)

B. Titanium (Ti)

C. Vanadium (V)

D. Chromium (Cr)

The electron configuration [Ar] $4s^2$ $3d^1$ indicates that the element has filled the 4s subshell with 2 electrons and has 1 electron in the 3d subshell. The [Ar] part signifies that the configuration begins with the electron configuration of Argon, which accounts for the first 18 electrons. After Argon, the next electrons fill the 4s subshell first, which can hold a maximum of 2 electrons. Following the 4s subshell, the electron configuration continues into the 3d subshell, which is being filled after the 4s. In this specific case, there is 1 electron in the 3d subshell. To find the element that corresponds to this configuration, we consider the total number of electrons: Argon contributes 18, plus 2 from $4s^2$, and 1 from $3d^1$, giving us a total of 21 electrons. The element with 21 electrons is Scandium (Sc), which is located in period 4 of the periodic table and belongs to the transition metals. Thus, this particular electron configuration points directly to Scandium, affirming its identity based on the distribution

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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://electronconfig.examzify.com

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

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