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.

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

1. What is the chemical symbol for the element with the configuration [Xe] $6s^2$ $4f^{11}$?

A. Samarium (Sm)

B. Holmium (Ho)

C. Plutonium (Pu)

D. Erbium (Er)

2. What element matches the electron configuration [Xe] 6s^2 4f^14 5d^10 6p^5?

A. Radon (Rn)

B. Astatine (At)

C. Bismuth (Bi)

D. No element corresponds to this.

3. Which element corresponds to the electron configuration [Rn] 7s^2 5f^14 6d^6?

A. Cadmium (Cd)

B. Hassium (Hs)

C. Mercury (Hg)

D. Lead (Pb)

4. Which element has the electron configuration 1s^2?

A. Oxygen

B. Helium

C. Lithium

D. Beryllium

5. [Rn] $7s^2$ 5f corresponds to which actinide element?

A. Berkelium (Bk)

B. Fermium (Fm)

C. Nobelium (No)

D. Einsteinium (Es)

6. What is the maximum number of electrons that can occupy a single orbital?

A. 1

B. 2

C. 3

D. 4

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

A. 8

B. 18

C. 32

D. 2

8. Which element is represented by the configuration [Xe] 6s^2 4f^14 5d^10 6p^4?

A. Polonium (Po)

B. Astatine (At)

C. Radon (Rn)

D. Lead (Pb)

9. What is the electron configuration for Sodium (Na)?

A. $1s^2$ $2s^2$ 2p $3s^1$

B. $1s^2$ $2s^2$ 2p $3p^1$

C. $1s^2$ $2s^2$ $3s^1$

D. $1s^2$ $2s^2$ 2p $3p^2$

10. What is the electron configuration of Phosphorus?

A. [Ne] 3s^2 3p^3

B. [Ne] 3s^2 3p^2

C. [Ne] 3s^2 3p^4

D. [Ne] 3s^2 3p^5

Answers

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

Explanations

1. What is the chemical symbol for the element with the configuration [Xe] $6s^2$ $4f^{11}$?

A. Samarium (Sm)

B. Holmium (Ho)

C. Plutonium (Pu)

D. Erbium (Er)

The electron configuration [Xe] $6s^2$ $4f^{11}$ corresponds to the element that has a total of 58 electrons in its outer shell, specifically in the 4f and 6s subshells. The notation indicates that the element has the same electron configuration as xenon up to the noble gas core, followed by two electrons in the 6s subshell and eleven electrons in the 4f subshell. This configuration points to an element in the lanthanide series, which includes the f-block elements where the 4f subshell is being filled. When analyzing the number of 4f electrons, we find that all relevant elements leading up to element 71 (lutetium) are indeed in the f-block. Since the configuration specifies $4f^{11}$, this directly identifies the element as having the atomic number of 67. Holmium (Ho) is the element with atomic number 67, making it the correct corresponding symbol for this configuration. The presence of the filled 4f subshell contributes significantly to the chemical properties of the element, which include its magnetic and optical characteristics. Hence, the chemical symbol for the element with the configuration [Xe] $6s^2$ 4f

2. What element matches the electron configuration [Xe] 6s^2 4f^14 5d^10 6p^5?

A. Radon (Rn)

B. Astatine (At)

C. Bismuth (Bi)

D. No element corresponds to this.

The electron configuration given is [Xe] $6s^2$ $4f^{14}$ $5d^1$ 6p , which indicates that the element has filled subshells (4f and 5d) along with additional electrons in the 6s and 6p orbitals. To analyze this configuration, we can break it down: - The [Xe] represents the electron configuration of xenon, which accounts for the first 54 electrons. - The $6s^2$ indicates that the element has 2 electrons in the 6s subshell. - The $4f^{14}$ indicates that there are 14 electrons fully occupying the 4f subshell. - The $5d^1$ signifies that there are 10 electrons in the 5d subshell. - Finally, the 6p shows that there are 5 electrons in the 6p subshell. To find the total number of electrons, we can add these together: 54 (from xenon) + 2 (from 6s) + 14 (from 4f) + 10 (from 5d) + 5 (from 6p) equals 85

3. Which element corresponds to the electron configuration [Rn] 7s^2 5f^14 6d^6?

A. Cadmium (Cd)

B. Hassium (Hs)

C. Mercury (Hg)

D. Lead (Pb)

The given electron configuration, [Rn] $7s^2$ $5f^{14}$ 6d , indicates that the element in question is in period 7 of the periodic table and contains electrons in the 7s, 5f, and 6d sublevels. To break down the configuration: - The [Rn] denotes the core electrons up to radon, which accounts for 86 electrons. - The $7s^2$ indicates there are 2 electrons in the 7s orbital. - The $5f^{14}$ suggests that the 5f sublevel is fully occupied with its maximum of 14 electrons. - The 6d points to 6 electrons in the 6d sublevel. When we total these, the electron count is: 86 (from Rn) + 2 (from 7s) + 14 (from 5f) + 6 (from 6d) = 108 electrons. The element with atomic number 108 is Hassium (Hs), which matches the provided electron configuration. This is confirmed by the fact that Hassium is a member of the transactinide series, situated in Group 8 and Period 7

4. Which element has the electron configuration 1s^2?

A. Oxygen

B. Helium

C. Lithium

D. Beryllium

The correct electron configuration for an element denotes how many electrons are present in its atomic structure and how they are distributed among various atomic orbitals. In the case of the configuration 1s^2, it specifies that there are two electrons occupying the 1s orbital. The element that corresponds to this specific electron configuration is helium. Helium has a total of two electrons, which fill the 1s orbital. Understanding that the 1s orbital can hold a maximum of two electrons provides a clearer insight into helium's stability as a noble gas, characterized by a complete outer shell. The other elements listed, such as oxygen, lithium, and beryllium, have different electron configurations. Oxygen has six electrons and would have a configuration of 1s^2 2s^2 2p^4. Lithium, with three electrons, would configure as 1s^2 2s^1, while beryllium, with four electrons, has a configuration of 1s^2 2s^2. Hence, only helium is accurately represented by the configuration 1s^2.

5. [Rn] $7s^2$ 5f corresponds to which actinide element?

A. Berkelium (Bk)

B. Fermium (Fm)

C. Nobelium (No)

D. Einsteinium (Es)

The electron configuration [Rn] $7s^2$ 5f corresponds to the element that has a total of 9 electrons in the 5f subshell, which places it within the actinide series of elements. To identify the element based on its electron configuration, it's helpful to recognize that the actinides are located in the f-block of the periodic table, specifically in the period corresponding to the 5f subshell. The sequence follows the filling of orbitals based on the Aufbau principle, where 5f is filled after the 6d orbitals. Each element in the actinide series has a distinct number of electrons, and the one with the configuration of 5f is specifically Fermium (Fm). Fermium is known to have an atomic number of 100, which fits the configuration of having 9 electrons in the 5f subshell after Radon (Rn) core. This means that the provided answer does not correctly correspond with the configuration mentioned. To give context, Berkelium (Bk), which is the choice given, corresponds to [Rn] $7s^2$ 5f , indicating that it does not reflect the correct number of electrons in the

6. What is the maximum number of electrons that can occupy a single orbital?

A. 1

B. 2

C. 3

D. 4

The maximum number of electrons that can occupy a single orbital is 2. This is based on the Pauli Exclusion Principle, which states that no two electrons in an atom can have the same set of quantum numbers. Since each electron possesses a unique spin (either spin-up or spin-down), only two electrons can occupy the same orbital while maintaining these distinct characteristics. Therefore, an orbital can hold a maximum of two electrons, with one having a spin of +1/2 and the other -1/2. This foundational concept is critical in understanding electron configurations and the arrangement of electrons in atoms across the periodic table.

7. 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.

8. Which element is represented by the configuration [Xe] 6s^2 4f^14 5d^10 6p^4?

A. Polonium (Po)

B. Astatine (At)

C. Radon (Rn)

D. Lead (Pb)

The electron configuration [Xe] 6s^2 4f^14 5d^10 6p^4 indicates that the element in question has a total of 34 electrons beyond the noble gas core represented by xenon (Xe). The notation tells us the following about the electron distribution: - The 6s subshell contains 2 electrons. - The 4f subshell is fully filled with 14 electrons. - The 5d subshell is also completely filled with 10 electrons. - The 6p subshell contains 4 electrons. When adding these up (2 + 14 + 10 + 4), you arrive at a total of 30 electrons beyond xenon's 54, which points to an atomic number of 84 when combined with the 54 from xenon. In the periodic table, the element with atomic number 84 is polonium (Po). The position of polonium in group 16 suggests it behaves similarly to other group 16 elements, which corresponds to its placement in the p-block. The electron configuration reflects polonium's nature as a post-transition metal with its unique properties and reactivity. Therefore, the correct choice represented by the given electron configuration

9. What is the electron configuration for Sodium (Na)?

A. $1s^2\ 2s^2\ 2p\ \ 3s^1$

B. $1s^2\ 2s^2\ 2p\ \ 3p^1$

C. $1s^2\ 2s^2\ 3s^1$

D. $1s^2\ 2s^2\ 2p\ \ 3p^2$

The correct electron configuration for sodium (Na) is indeed $1s^2\ 2s^2\ 2p\ \ 3s^1$. Sodium has an atomic number of 11, which means it has 11 electrons. The electron configuration describes how these electrons are distributed among the different atomic orbitals. In the configuration $1s^2\ 2s^2\ 2p$, the first two electrons fill the 1s orbital, the next two electrons fill the 2s orbital, and the subsequent six electrons completely fill the 2p orbital, which is the maximum capacity of that sublevel. After these ten electrons are accounted for, the remaining electron occupies the 3s orbital, represented as $3s^1$. This distribution reflects the order of orbital filling according to the Aufbau principle, which states that electrons fill from the lowest energy level to the highest. The configuration reflects both the number of electrons present in each subshell and adheres to the established rules of electron distribution, which include Pauli's exclusion principle and Hund's rule. Therefore, the first option accurately represents the electron configuration of sodium.

10. What is the electron configuration of Phosphorus?

A. [Ne] 3s^2 3p^3

B. [Ne] 3s^2 3p^2

C. [Ne] 3s^2 3p^4

D. [Ne] 3s^2 3p^5

The electron configuration of Phosphorus, which has an atomic number of 15, accurately describes the distribution of its electrons across various energy levels and subshells. Using the noble gas shorthand notation, we start with the nearest noble gas preceding Phosphorus, which is Neon, represented as [Ne]. Neon has an atomic number of 10, so it accounts for the first 10 electrons. After Neon, Phosphorus has 5 additional electrons to place in the 3rd energy level. The 3s subshell can hold a maximum of 2 electrons, so those are filled first, represented as $3s^2$. Following that, the remaining 3 electrons go into the 3p subshell. The 3p subshell can hold up to 6 electrons, but for phosphorus, only 3 are needed. Thus, this is represented as $3p^3$. Combining these designations, the complete electron configuration for Phosphorus becomes [Ne] $3s^2$ $3p^3$. This configuration reflects that phosphorus has a total of 15 electrons, fulfilling its atom's structure according to the Aufbau principle, which dictates that electrons occupy the lowest energy orbitals first. The option that states [Ne

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!