NOVA Hunting the Elements Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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. Which element has the symbol Sn and is widely used in solder?

A. Lead

B. Zinc

C. Tin

D. Nickel

2. What common object contains phosphorus, and what is an associated property?

A. Matches; ATP

B. Water; ATP

C. Charcoal; ATP

D. Salt; ATP

3. In the mousetrap simulation, which component represents the neutrons?

A. Ping pong balls

B. Mousetraps

C. Boxes

D. Tape

4. What is the main difficulty that leads to shortages of rare earth elements?

A. Hard to separate

B. Easy to process

C. Abundant in most rocks

D. Not useful in industry

5. In a neutral atom, the number of electrons equals the number of protons.

A. Electrons equal to protons

B. Electrons equal to neutrons

C. Electrons equal to mass number

D. Electrons equal to proton minus neutrons

6. Half-life is the time required for which event?

A. Time needed for the entire sample to decay

B. Time required for half of the sample to decay

C. Time for one decay event

D. Time for the sample to double in mass

7. What is created in a supernova explosion?

A. Elements heavier than iron

B. Only hydrogen gas

C. Only helium gas

D. Light elements only

8. An atom with 17 protons belongs to which element?

A. Chlorine

B. Argon

C. Bromine

D. Fluorine

9. Which substance is in the solid state at room conditions according to the material?

A. Chlorine

B. Sodium Chloride

C. ANFO

D. Sodium

10. What element was used as fuel for the "Little Boy" bomb?

A. Uranium-235

B. Plutonium-239

C. Uranium-238

D. Thorium-232

Answers

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

Explanations

1. Which element has the symbol Sn and is widely used in solder?

A. Lead

B. Zinc

C. Tin

D. Nickel

Tin is the element with the symbol Sn. Its name comes from the Latin stannum. Tin is widely used in solder because it melts at a relatively low temperature and flows well over metal surfaces, forming a smooth, conductive joint when it wets copper and other metals used in electronics. Historically, solders combined tin with lead, but modern practice often uses tin-based alloys with small amounts of other metals to avoid lead. The other elements mentioned—lead, zinc, and nickel—have different symbols (Pb, Zn, Ni) and are not identified by Sn in common solder contexts.

2. What common object contains phosphorus, and what is an associated property?

A. Matches; ATP

B. Water; ATP

C. Charcoal; ATP

D. Salt; ATP

Phosphorus shows up in a common object: matches. A key related idea is ATP, the energy-carrying molecule in cells, which contains phosphate groups and stores/releases energy when their bonds are broken. So matches illustrate phosphorus in everyday items, and ATP highlights how phosphorus is critical for energy transfer in biology. The other options don't fit because water, charcoal, and salt aren't typical sources of phosphorus, and ATP is the biological molecule linked to phosphorus—not a feature of those other objects.

3. In the mousetrap simulation, which component represents the neutrons?

A. Ping pong balls

B. Mousetraps

C. Boxes

D. Tape

Ping pong balls stand in for neutrons in this hands on model. Neutrons are the moving particles that travel from one nucleus to another and cause fission when they collide with a nucleus, releasing more neutrons that keep the reaction going. In the mousetrap simulation, a ping pong ball moves around and, when it hits a mousetrap, the trap represents a nucleus undergoing fission and releasing additional neutrons (the ball), which can then hit other traps. The boxes are just positions or barriers for the atoms, and tape is simply used to set things up, not to represent particles. So the ping pong balls best embody the neutrons.

4. What is the main difficulty that leads to shortages of rare earth elements?

A. Hard to separate

B. Easy to process

C. Abundant in most rocks

D. Not useful in industry

The key idea is that these elements behave so similarly in chemistry that separating them from one another is extremely challenging. In natural minerals, several rare earths occur together, so turning ore into pure individual elements requires many careful, multi-step purification processes. Each step uses significant energy and solvents, and small inefficiencies or disruptions can reduce yields and raise costs. Because a few facilities control most of the refining, any hiccup in supply can create noticeable shortages. So the difficulty of separating the elements from each other is what drives the supply challenges.

5. In a neutral atom, the number of electrons equals the number of protons.

A. Electrons equal to protons

B. Electrons equal to neutrons

C. Electrons equal to mass number

D. Electrons equal to proton minus neutrons

The idea being tested is charge balance in a neutral atom. In a neutral atom, the positive charges from protons must be exactly canceled by the negative charges from electrons, so the numbers are equal. Neutrons don't participate in electrical charge, they just add to the mass, so they don't affect neutrality. The mass number is the sum of protons and neutrons, not electrons, so it doesn't set the electron count. For example, a neutral carbon atom has 6 protons and 6 electrons (and 6 neutrons), giving no net charge. If the electrons didn't match the protons, the atom would carry a net charge and become an ion.

6. Half-life is the time required for which event?

A. Time needed for the entire sample to decay

B. Time required for half of the sample to decay

C. Time for one decay event

D. Time for the sample to double in mass

Half-life is the time it takes for half of the radioactive nuclei in a sample to decay. This duration is a constant for a given isotope and reflects the exponential nature of radioactive decay. After one half-life, about 50% remain; after two half-lives, about 25%, and so on. The concept focuses on the behavior of the whole sample over time, not on a single decay event, which is random for individual atoms. The time for a single decay varies, and the time for the entire sample to vanish would require many half-lives and isn't a fixed moment. Doubling in mass would be the opposite of decay.

7. What is created in a supernova explosion?

A. Elements heavier than iron

B. Only hydrogen gas

C. Only helium gas

D. Light elements only

In a supernova, nuclei are built under extreme heat, pressure, and a flood of neutrons, allowing nucleosynthesis to push beyond what happens in normal stellar burning. The rapid neutron-capture process creates new nuclei heavier than iron, and those newly formed heavy elements are ejected into space by the explosion. This is how fresh heavy elements—like nickel, copper, silver, gold, and many others—are forged and dispersed into the interstellar medium for future stars and planets to incorporate. Lighter elements such as hydrogen and helium are already present from earlier stages of the star's life or from earlier epochs of the universe, so the defining production during a supernova is the creation of heavy elements beyond iron, not just the buildup of light gases.

8. An atom with 17 protons belongs to which element?

A. Chlorine

B. Argon

C. Bromine

D. Fluorine

The number of protons in the nucleus determines the element's identity. Atomic number equals the count of protons. An atom with 17 protons has atomic number 17, which corresponds to chlorine. The other options have different numbers of protons (fluorine 9, argon 18, bromine 35), so they aren't the element with 17 protons. Remember that isotopes and ions can change neutrons or electrons, but the element itself is fixed by the number of protons.

9. Which substance is in the solid state at room conditions according to the material?

A. Chlorine

B. Sodium Chloride

C. ANFO

D. Sodium

At room temperature, the state a substance is in depends on how strongly its particles are held together. Ionic compounds form rigid crystal lattices with strong electrostatic bonds, so they stay solid and have high melting points. Sodium chloride fits this pattern: its ions are locked into a stable lattice, making it a solid at room conditions. Chlorine, on the other hand, is a diatomic molecule held together by relatively weak forces between molecules, so it exists as a gas at room temperature. ANFO is a mixture, not a single pure substance, and its components behave differently under ordinary conditions, so its overall state isn't described the same way as a pure solid. Sodium is a metal and is also solid at room temperature, but the example given aligns with the common solid salt form described in the material.

10. What element was used as fuel for the "Little Boy" bomb?

A. Uranium-235

B. Plutonium-239

C. Uranium-238

D. Thorium-232

Fission fuel must be fissile, meaning it can sustain a rapid chain reaction when struck by neutrons. Little Boy used highly enriched uranium-235 because it fissions readily with neutrons and can be assembled into a supercritical mass with a simple gun-type design: one piece of uranium-235 is fired into another, creating a single, large mass that undergoes a fast, runaway reaction. Plutonium-239 is also fissile and was used in the Fat Man device with a more complex implosion design, partly to manage issues like spontaneous fission. Uranium-238 isn't easily fissioned by slow neutrons and isn't suitable as a standalone weapon fuel, while thorium-232 is fertile and would need conversion to a fissile form in a reactor. So the fuel for Little Boy is uranium-235.

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://novahuntingtheelements.examzify.com

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