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. In the lemon shark experiment, what is the role of samarium?

A. Experimental group

B. Control group

C. Independent variable

D. Dependent variable

2. Which statement about noble gases is true?

A. They do not react with other elements

B. They are highly reactive

C. They form many ions in solution

D. They always form acids

3. In the carbon isotope discussion, how many protons/electrons do Carbon-12, Carbon-13, and Carbon-14 share?

A. 6

B. 12

C. 13

D. 14

4. What best describes gold's density?

A. It is light

B. It is dense

C. It is extremely light

D. It has low density

5. When a star exhausts its hydrogen fuel, what elements are produced?

A. It makes larger elements up to iron

B. It creates only hydrogen again

C. It creates only helium

D. It dissolves into gas

6. Describe the fusion process that forms helium.

A. It fuses two hydrogen atoms to make a helium atom

B. It splits helium into hydrogen

C. It fuses carbon and nitrogen

D. It fuses oxygen and neon

7. Which mineral is primarily associated with nervous system function?

A. Sodium

B. Potassium

C. Calcium

D. Magnesium

8. What state of matter is sodium chloride?

A. Gas

B. Liquid

C. Solid

D. Plasma

9. What term describes the arrangement of atoms in pure metals?

A. Orderly rows and columns

B. Uniform spheres only

C. Random clusters

D. Spiral lattice

10. Define radioactive half-life.

A. The time for all nuclei to decay

B. The time for half the radioactive nuclei to decay

C. The time for a nucleus to decay completely

D. The time for production of radioactive material

Answers

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

Explanations

1. In the lemon shark experiment, what is the role of samarium?

A. Experimental group

B. Control group

C. Independent variable

D. Dependent variable

In experiments, you compare groups to see what a treatment does. The group that receives the treatment is the experimental group, because they're exposed to the variable you're testing. In the lemon shark setup, samarium is the treatment you apply to the sharks in that group. So the role samarium plays is to identify which sharks are in the experimental group—the ones that get the substance and are being tested for any resulting effects. The sharks that don't get samarium form the control group, used for comparison. If you were naming the actual factor being changed, that would be the independent variable (samarium itself), and what you measure afterward would be the dependent variable (such as a physiological response).

2. Which statement about noble gases is true?

A. They do not react with other elements

B. They are highly reactive

C. They form many ions in solution

D. They always form acids

Noble gases are chemically very stable because their outer electron shells are full. That filled valence shell means there's little tendency to gain or lose electrons to form bonds, so they don't readily react with other elements under normal conditions. Since reactions are all about reconfiguring electrons, this inert nature explains why they rarely form ions in solution and do not typically form acids. There are rare, extreme cases where one or two noble gases can participate in compounds (like xenon fluorides), but those are exceptional and require special conditions. So the statement that noble gases do not react with other elements best captures their general behavior.

3. In the carbon isotope discussion, how many protons/electrons do Carbon-12, Carbon-13, and Carbon-14 share?

A. 6

B. 12

C. 13

D. 14

Protons determine the identity of the element, and in a neutral atom the number of electrons equals the number of protons. Isotopes differ only in the number of neutrons, not in protons. Carbon always has 6 protons, so each of Carbon-12, Carbon-13, and Carbon-14 has 6 protons and, if neutral, 6 electrons. The numbers 12, 13, and 14 refer to the total mass (protons plus neutrons), not the count of protons/electrons. Therefore, they all share 6 protons and 6 electrons.

4. What best describes gold's density?

A. It is light

B. It is dense

C. It is extremely light

D. It has low density

Density measures how much matter is packed into a given volume. Gold has a high density because its atoms are heavy and packed tightly, so a small piece weighs a lot for its size. In numbers, gold runs around 19.3 g/cm³, which is far denser than common materials like water (about 1 g/cm³). That's why gold is described as dense: it feels heavy for its size. The other options describe materials that are light or have low density, which doesn't match gold's characteristic.

5. When a star exhausts its hydrogen fuel, what elements are produced?

A. It makes larger elements up to iron

B. It creates only hydrogen again

C. It creates only helium

D. It dissolves into gas

When hydrogen fusion ends, the star's core contracts and heats up enough to start fusing helium. This next stage builds up heavier elements: helium nuclei fuse to form carbon, and carbon can capture more helium to become oxygen. In stars with enough mass, the fusion chain continues through even heavier elements—neon, magnesium, silicon, and others—piling up elements all the way to iron in the core. Iron is the practical stopping point for steady fusion in a star because fusing iron doesn't release energy. Heavier elements aren't produced by normal fusion in the star's life; they're mainly formed later in the explosive supernova. So the produced elements span from helium up to iron during the star's evolution, which is why the statement that larger elements up to iron are produced is the best fit.

6. Describe the fusion process that forms helium.

A. It fuses two hydrogen atoms to make a helium atom

B. It splits helium into hydrogen

C. It fuses carbon and nitrogen

D. It fuses oxygen and neon

Hydrogen fusion into helium powers stars. In the proton-proton chain that dominates in Sun-like stars, hydrogen nuclei (protons) fuse through several steps to ultimately form helium-4 and release energy. First, two protons fuse to create deuterium while emitting a positron and a neutrino; deuterium then fuses with another proton to make helium-3; when two helium-3 nuclei meet, they form helium-4 and release two protons to keep the cycle going. Net result: four hydrogen nuclei become one helium nucleus, with energy carried away as light and heat. The idea described here is that hydrogen particles fuse to build helium, which is the essential concept. The other options describe splitting helium or fusing heavier elements, which are not how helium is formed in stars.

7. Which mineral is primarily associated with nervous system function?

A. Sodium

B. Potassium

C. Calcium

D. Magnesium

Nerve signals depend on moving charged particles across the neuron's membrane. The outside of a neuron has a higher concentration of sodium, while the inside has more potassium, thanks to the Na+/K+ pump that maintains these gradients. When a neuron is stimulated, voltage-gated sodium channels open and sodium rushes into the cell. This rapid influx depolarizes the membrane, reaching a threshold that triggers an action potential that travels along the neuron. After the peak, potassium channels open to let K+ exit, helping restore the resting membrane potential, and the pump gradually reestablishes the original gradients. Calcium is crucial for releasing neurotransmitters at the synapse, and magnesium plays supporting roles in enzyme activity and receptor function, but the mineral most directly linked to starting and propagating nerve impulses is sodium. Its role in depolarization is the key reason it's the best answer.

8. What state of matter is sodium chloride?

A. Gas

B. Liquid

C. Solid

D. Plasma

Sodium chloride is a solid at room temperature because it forms a strong ionic crystal lattice. In solids, the particles are tightly packed in a fixed arrangement, giving the substance a definite shape and volume and making it not flow like a liquid. It would only become a liquid when heated well above room temperature (melting around 801°C) and could become a gas or plasma only under far more extreme conditions. So, under standard conditions, sodium chloride is a solid.

9. What term describes the arrangement of atoms in pure metals?

A. Orderly rows and columns

B. Uniform spheres only

C. Random clusters

D. Spiral lattice

Metals form a crystal lattice—an organized, repeating pattern of atoms that extends in all directions. Describing this as an orderly, repeating arrangement is a simple way to picture how atoms sit at regular positions relative to one another. The phrase about orderly rows and columns captures that regular, grid-like structure, which is why it's the best match for pure metals' arrangement. The other ideas don't fit long-range order: imagining only uniform spheres misses the sense of a shared, repeating network; random clusters imply no consistent pattern; a spiral lattice isn't how metal atoms typically pack in a solid.

10. Define radioactive half-life.

A. The time for all nuclei to decay

B. The time for half the radioactive nuclei to decay

C. The time for a nucleus to decay completely

D. The time for production of radioactive material

Half-life is the time it takes for half of the unstable nuclei in a sample to decay. For a given isotope, this interval is constant and doesn't depend on how much material you have or on environmental conditions. After one half-life, about half remains undecayed; after two half-lives, about a quarter remains, and so on, following N = N0(1/2)^(t/T1/2). This definition is why the correct choice is best: it directly describes the time needed for half of the radioactive nuclei to decay, which is the essence of what half-life measures. The idea that all nuclei would decay in a finite time isn't correct because decay is probabilistic and some nuclei can persist for very long times; it isn't the time for a nucleus to decay completely, and it isn't about the production of radioactive material.

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!