

RADIATION SAFETY PRACTICE EXAM (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

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- 1. Which of the following is NOT a method to reduce radiation exposure?**
 - A. Time
 - B. Distance
 - C. Increased radiation levels
 - D. Shielding
- 2. Which type of radiation is primarily responsible for ionization in atoms?**
 - A. Alpha radiation
 - B. Beta radiation
 - C. Gamma radiation
 - D. All of the above
- 3. What material is commonly used in gamma and X-ray scintillation probes to enhance interaction detection?**
 - A. Cadmium sulfide
 - B. Sodium iodide
 - C. Zinc oxide
 - D. Lead iodide
- 4. Which atom is considered an ion?**
 - A. Hydrogen
 - B. Protium
 - C. Deuterium
 - D. Helium
- 5. Which hydrogen isotope is known to be unstable?**
 - A. Protium
 - B. Deuterium
 - C. Tritium
 - D. Hydrogen-1
- 6. What is one of the key responsibilities outlined in DA PAM 385-24?**
 - A. Inventory
 - B. Budgeting
 - C. Recruitment
 - D. Public Relations

- 7. What is the last step in the double-bagging procedure?**
- A. Dispose of the bags immediately.
 - B. Mark the outer bag and write "DO NOT OPEN!".
 - C. Remove the source from the bag.
 - D. Notify a supervisor of the completed task.
- 8. The most common isotope of carbon has how many neutrons?**
- A. 6
 - B. 8
 - C. 12
 - D. 14
- 9. What term describes the dose of radiation received by workers who are regularly exposed?**
- A. Occupational Dose
 - B. Environmental Dose
 - C. Residual Dose
 - D. Incidental Dose
- 10. After sealing the first bag, how should it be secured?**
- A. Leave it unsealed for ventilation.
 - B. Wrap it with additional packaging.
 - C. Tape it shut at both the base and the top of the twist.
 - D. Place it directly into a hazardous waste container.

Answers

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

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Explanations

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1. Which of the following is NOT a method to reduce radiation exposure?

- A. Time
- B. Distance
- C. Increased radiation levels**
- D. Shielding

To reduce radiation exposure effectively, the principles of time, distance, and shielding are commonly applied. Time refers to the duration of exposure to radiation; minimizing time reduces the total dose received. The longer one is near a radiation source, the greater the exposure, hence limiting time spent in the vicinity of radiation sources mitigates risk. Distance is a critical factor because radiation intensity decreases with increasing distance from the source. This is based on the inverse square law, which states that doubling the distance from a radiation source reduces the exposure to a quarter of its intensity. Therefore, maintaining or increasing distance from radiation sources significantly aids in reducing exposure. Shielding involves using materials to absorb or block radiation, thus protecting individuals from exposure. Dense materials such as lead, concrete, or thick plastic can be effective shields against different types of radiation, depending on their energy levels and nature. In contrast, increased radiation levels represent a situation that would elevate exposure rather than mitigate it. Therefore, this choice distinguishes itself as NOT a method used to reduce radiation exposure since it inherently increases risk rather than providing protective benefit.

2. Which type of radiation is primarily responsible for ionization in atoms?

- A. Alpha radiation
- B. Beta radiation
- C. Gamma radiation
- D. All of the above**

The correct answer is that all types of radiation can lead to ionization in atoms, which means that they can knock electrons off atoms, creating positively charged ions. Alpha radiation consists of heavy particles made up of two protons and two neutrons, which are emitted from certain types of radioactive decay. Due to their large mass and positive charge, alpha particles have a strong interaction with matter, causing significant ionization as they pass through materials. However, their physical range is limited, and they cannot penetrate solid materials effectively. Beta radiation consists of fast-moving electrons (or positrons) released from a nucleus during radioactive decay. Beta particles are lighter than alpha particles and can penetrate materials more effectively, also causing ionization as they collide with atoms. Their velocity and lower mass allow them to travel further than alpha particles, leading to ionization deeper within materials. Gamma radiation is composed of high-energy electromagnetic waves and is very penetrating. While gamma radiation carries no mass or charge, it can still interact with matter through processes such as the photoelectric effect, Compton scattering, and pair production, leading to ionization. Since all three types of radiation—alpha, beta, and gamma—can cause ionization in atoms through their respective interactions with matter, this leads

3. What material is commonly used in gamma and X-ray scintillation probes to enhance interaction detection?

- A. Cadmium sulfide
- B. Sodium iodide**
- C. Zinc oxide
- D. Lead iodide

Sodium iodide is a widely used scintillation material for gamma and X-ray detection because of its effective performance in converting incident radiation into detectable light signals. When gamma rays or X-rays interact with sodium iodide, they excite the crystal's atoms, leading to the emission of scintillation light, typically in the visible spectrum. This property makes sodium iodide particularly valuable in applications requiring sensitive detection of high-energy photons. Its high atomic number and density also contribute to a greater probability of interaction with incoming radiation, which enhances the overall efficiency of detection. Additionally, sodium iodide crystals can be easily doped with thallium (NaI(Tl)), which further improves their scintillation efficiency and allows for better energy resolution in detecting different radiation levels. Thus, sodium iodide is recognized as one of the optimal materials for creating scintillation probes used in radiation safety and detection applications.

4. Which atom is considered an ion?

- A. Hydrogen
- B. Protium**
- C. Deuterium
- D. Helium

An ion is defined as an atom or molecule that has gained or lost one or more electrons, resulting in a net electrical charge. The correct answer identifies a specific type of hydrogen atom known as protium, which is indeed an isotope of hydrogen, characterized by having only one proton and no neutrons in its nucleus. However, protium itself is not inherently an ion; it is a neutral atom. The key to understanding this question lies in recognizing that ions can be formed from any type of atom, including hydrogen and its isotopes, through processes like ionization where electrons are added or removed. In the context of the other choices, hydrogen is a general term that also includes its isotopes (protium, deuterium, and tritium), while deuterium, which has one proton and one neutron, is another stable isotope of hydrogen. Therefore, while all isotopes and neutral atoms can become ions, without a specific mention of charge, both protium and the other isotopes (deuterium and helium) could fit the definition of an ion if they gain or lose electrons. In summary, the phrasing and context of the question might indicate that the answer references the specific form of hydrogen; however, a neutral atom like

5. Which hydrogen isotope is known to be unstable?

- A. Protium
- B. Deuterium
- C. Tritium**
- D. Hydrogen-1

Tritium is the hydrogen isotope known to be unstable. It is a radioactive isotope consisting of one proton and two neutrons, which contributes to its instability. Tritium undergoes beta decay, where it transforms into helium-3, releasing a beta particle in the process. This decay occurs over a half-life of approximately 12.3 years, making tritium not only unstable but also a source of low-level radiation during its decay. In contrast, protium (the most common isotope of hydrogen), which contains only one proton and no neutrons, and deuterium, which consists of one proton and one neutron, are stable and do not undergo radioactive decay. Hydrogen-1 is another name for protium and shares the same stability characteristics. Thus, tritium stands out as the only unstable hydrogen isotope among the choices presented.

6. What is one of the key responsibilities outlined in DA PAM 385-24?

- A. Inventory**
- B. Budgeting
- C. Recruitment
- D. Public Relations

One of the key responsibilities outlined in DA PAM 385-24 is inventory. This focus is essential because inventory management in radiation safety ensures that all radioactive materials and sources are properly accounted for, maintained, and secured. It helps prevent unauthorized access and ensures compliance with safety regulations. Effective inventory management is critical for tracking dosimeters, radioactive waste, and other materials that could pose radiation exposure risks if not handled appropriately. Regular inventory checks assist in identifying any discrepancies, which is crucial for maintaining safety standards and ensuring the integrity of radiation safety programs.

7. What is the last step in the double-bagging procedure?

- A. Dispose of the bags immediately.
- B. Mark the outer bag and write "DO NOT OPEN!"**
- C. Remove the source from the bag.
- D. Notify a supervisor of the completed task.

The last step in the double-bagging procedure involves marking the outer bag with "DO NOT OPEN!" This step is critical because it serves as a clear warning and precaution to anyone who may come into contact with the bag, signaling that the contents may be hazardous and should not be disturbed. This labeling helps maintain safety protocols by ensuring that the bag remains sealed until it is processed appropriately. Proper identification of potentially dangerous materials is essential in radiation safety to prevent accidental exposure. The marking eliminates any ambiguity regarding the contents and indicates that specific handling procedures are necessary before opening or disposing of the bag. This step ensures that all personnel follow safety precautions and protects them from potential contamination or exposure to radiation.

8. The most common isotope of carbon has how many neutrons?

- A. 6**
- B. 8
- C. 12
- D. 14

The most common isotope of carbon is carbon-12, which is denoted as $^{12}_{6}\text{C}$. In isotope notation, the number at the top (12) represents the mass number, which is the total number of protons and neutrons in the nucleus, while the bottom number (6) indicates the atomic number, which is the number of protons. Since carbon has an atomic number of 6, it contains 6 protons. To find the number of neutrons in the most common isotope, you subtract the number of protons from the mass number. Therefore, for carbon-12: Number of neutrons = Mass number - Number of protons = $12 - 6 = 6$. This means that the most common isotope of carbon, carbon-12, has 6 neutrons. The other specified options refer to different quantities that do not accurately represent the neutron count in the most prevalent carbon isotope.

9. What term describes the dose of radiation received by workers who are regularly exposed?

- A. Occupational Dose**
- B. Environmental Dose
- C. Residual Dose
- D. Incidental Dose

The term that accurately describes the dose of radiation received by workers who are regularly exposed is "Occupational Dose." This term refers specifically to the amount of radiation that individuals working in environments where they are likely to encounter radiation receive as part of their job. Regulatory standards are established to monitor and limit this type of exposure to ensure worker safety and health. In the context of radiation safety, occupational dose is a critical consideration, as it directly impacts the well-being of professionals such as radiologic technologists, nuclear power plant workers, and other individuals whose jobs require them to work with or around radiation. Agencies like the International Commission on Radiological Protection (ICRP) and the U.S. Environmental Protection Agency (EPA) provide guidance on acceptable levels of occupational exposure to minimize risks associated with radiation. The other terms mentioned describe different contexts of radiation exposure. Environmental dose refers to radiation exposure from natural and man-made sources in the environment, such as cosmic radiation or radon gas. Residual dose pertains to the radiation that remains in an area after a radiation source has been removed or after an incident, and incidental dose refers to exposure that occurs inadvertently, without the individual intending to be exposed. These distinctions are important in understanding the various types of radiation exposure but do not

10. After sealing the first bag, how should it be secured?

- A. Leave it unsealed for ventilation.
- B. Wrap it with additional packaging.
- C. Tape it shut at both the base and the top of the twist.**
- D. Place it directly into a hazardous waste container.

The most appropriate method for securing the bag after sealing it is to tape it shut at both the base and the top of the twist. This technique ensures that the contents remain contained and minimizes the risk of accidental spills or exposure to hazardous materials. By using tape, the seal is reinforced, providing an added layer of security that helps to prevent any leakage, which is crucial in maintaining safety protocols, especially when dealing with potentially harmful substances. Using tape effectively creates a barrier that helps keep the bag closed, thus protecting both personnel and the environment from any hazards that might be associated with the bag's contents. It is a standard practice in handling and disposing of waste materials to ensure that they are securely sealed, thus preventing any risk of contamination. Other options, such as leaving it unsealed for ventilation or placing it directly into a hazardous waste container without additional securing measures, are not advisable, as they could compromise safety and contaminate the surroundings or the storage facility. Wrapping it in additional packaging may provide some extra support, but it is not as effective as ensuring the initial seal is firmly secured with tape.

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://radiationsafety.examzify.com>

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

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