

# Texas Industrial Radiography Gamma Practice Test (Sample)

## Study Guide



**Everything you need from our exam experts!**

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# Table of Contents

<b>Copyright</b> .....	<b>1</b>
<b>Table of Contents</b> .....	<b>2</b>
<b>Introduction</b> .....	<b>3</b>
<b>How to Use This Guide</b> .....	<b>4</b>
<b>Questions</b> .....	<b>5</b>
<b>Answers</b> .....	<b>8</b>
<b>Explanations</b> .....	<b>10</b>
<b>Next Steps</b> .....	<b>16</b>

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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. The term 'source assembly' in radiographic practice refers to:**
  - A. The container for radioactive material**
  - B. The mechanism that houses the imaging film**
  - C. The device that emits radiation**
  - D. The protective gear worn by radiographers**
  
- 2. What factor can adversely affect the accuracy of Film Badge readings?**
  - A. Strong winds**
  - B. Excessive heat**
  - C. Radio waves**
  - D. None of the above**
  
- 3. Which are common conditions that can lead to inaccurate dosimeter readings?**
  - A. Extreme temperatures**
  - B. Being stored improperly**
  - C. Both A and B**
  - D. None of the above**
  
- 4. What dose would you receive if you stood at a location with a survey instrument reading of 100 mr/hr for 6 minutes?**
  - A. 10 mrem**
  - B. 25 mrem**
  - C. 6 mrem**
  - D. 60 mrem**
  
- 5. Which human senses can detect Gamma and X-Radiation?**
  - A. Sight and Touch**
  - B. Smell and Taste**
  - C. Sight and Hearing**
  - D. None of the above**

- 6. What does the unit "Rem" measure in radiation contexts?**
- A. Activity**
  - B. Dose in air**
  - C. Dose in man**
  - D. Intensity**
- 7. What is a common method to verify the integrity of a gamma radiography source?**
- A. Conducting regular performance checks**
  - B. Storing it in a larger container**
  - C. Utilizing it only at night**
  - D. Cleaning it with chemical solutions**
- 8. Using a Cobalt 60 source, if you determine the exposure time required to give the desired results for a certain set-up, in two years how much will your exposure time need to be increased to achieve the same results?**
- A. 100% longer**
  - B. 60% longer**
  - C. 40% longer**
  - D. 15% longer**
- 9. Why is it important to report any radiation incident immediately?**
- A. To document the incident for future reference**
  - B. To ensure quick investigation and minimize health risks**
  - C. To assess damage to equipment**
  - D. To determine the cost of the incident**
- 10. During industrial radiography operations, what is the purpose of an alarm ratemeter?**
- A. To measure radiation intensity**
  - B. To signal high radiation levels**
  - C. To record gamma exposure**
  - D. To calibrate the exposure device**

## Answers

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

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## **Explanations**

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**1. The term 'source assembly' in radiographic practice refers to:**

- A. The container for radioactive material**
- B. The mechanism that houses the imaging film**
- C. The device that emits radiation**
- D. The protective gear worn by radiographers**

In radiographic practice, the term 'source assembly' specifically refers to the device that emits radiation. This is a critical component of radiographic systems, as it contains the radioactive material that is used to produce the gamma rays necessary for imaging. The source assembly is engineered to ensure that the radiation is directed appropriately and safely during the radiographic process. Understanding this term is essential for radiographers because the source assembly must be handled with care and attention to safety regulations to protect both the operator and the environment from unnecessary exposure to radiation. The design and functions of the source assembly also play a crucial role in achieving high-quality images during the radiographic inspection process. The other options pertain to different components and equipment within the radiographic suite but do not accurately represent what the source assembly is. The container for radioactive material is more accurately referred to as the 'source container.' The mechanism that houses the imaging film is part of the film holder or a similar device, and protective gear refers to items like lead aprons that radiographers wear to shield themselves from radiation exposure.

**2. What factor can adversely affect the accuracy of Film Badge readings?**

- A. Strong winds**
- B. Excessive heat**
- C. Radio waves**
- D. None of the above**

Excessive heat can adversely affect the accuracy of Film Badge readings because film badges contain photo-sensitive materials that can be altered by elevated temperatures. When exposed to excessive heat, the development process of the film can be accelerated or otherwise affected, leading to inaccurate readings of radiation exposure. This can result in either an underestimation or overestimation of the amount of radiation to which an individual has been exposed, compromising the effectiveness of the monitoring system designed to protect workers from excessive radiation. On the other hand, strong winds and radio waves do not have a direct impact on the film's sensitivity or development process. Wind may affect the physical conditions at the work site but does not interact with the chemical processes of the film. Similarly, radio waves do not influence the film exposure in a way that would change readings, as film badges are designed specifically to respond to ionizing radiation rather than non-ionizing forms such as radio frequencies. Therefore, excessive heat stands out as the significant factor that can impair the integrity of Film Badge readings.

**3. Which are common conditions that can lead to inaccurate dosimeter readings?**

- A. Extreme temperatures**
- B. Being stored improperly**
- C. Both A and B**
- D. None of the above**

Common conditions that can lead to inaccurate dosimeter readings include extreme temperatures and improper storage. Extreme temperatures can affect the chemical and physical properties of the dosimeter material. For instance, high temperatures may cause the dosimeter to respond to radiation differently, potentially leading to overestimation of exposure if the dosimeter's calibration has not accounted for such conditions. Similarly, low temperatures can affect the mobility of the radiation-sensitive material, resulting in inconsistent readings. Improper storage can also significantly impact dosimeter accuracy. For example, storing dosimeters in areas with high radiation levels, humidity, or in proximity to other sources of radiation can cause contamination or false readings. Dosimeters need to be kept in controlled conditions, typically in a low-radiation environment, to ensure their reliability. Therefore, both extreme temperatures and improper storage are critical factors that can compromise the integrity of dosimeter readings, making them unreliable for accurate assessment of radiation exposure. This understanding emphasizes the importance of proper handling and environment for dosimeters in industrial radiography.

**4. What dose would you receive if you stood at a location with a survey instrument reading of 100 mr/hr for 6 minutes?**

- A. 10 mrem**
- B. 25 mrem**
- C. 6 mrem**
- D. 60 mrem**

To calculate the dose received in this scenario, it's important to understand how to convert the survey instrument reading and the exposure time into a dose. The survey reading indicates the dose rate, which in this case is 100 milliroentgen per hour (mr/hr). First, convert the time from minutes to hours: 6 minutes is equivalent to 0.1 hours (since 6 minutes divided by 60 minutes per hour equals 0.1 hours). Now, using the dose rate, we can calculate the dose received during that time period: Dose (in mrem) = Dose rate (in mr/hr) × Time (in hours). So, using the provided numbers: Dose = 100 mr/hr × 0.1 hr = 10 mrem. This shows that the dose received at a location with a survey instrument reading of 100 mr/hr over a duration of 6 minutes is indeed 10 mrem. The calculation demonstrates that when consistently applying the units and conversion factors, the correct conclusion leads to a dose of 10 mrem, validating that the answer provided aligns with the expected results in this type of radiographic scenario.

## 5. Which human senses can detect Gamma and X-Radiation?

- A. Sight and Touch
- B. Smell and Taste
- C. Sight and Hearing
- D. None of the above**

Gamma and X-radiation are forms of ionizing radiation that cannot be detected by human senses. Unlike visible light, which can be seen, or sound waves that can be heard, gamma and X-rays do not produce any sensory feedback that we can perceive. As a result, individuals cannot rely on sight, touch, smell, taste, or hearing to detect these types of radiation. This is why the correct answer is that none of the provided human senses can detect gamma and X-radiation. Detection requires specialized equipment, such as Geiger counters or dosimeters, to measure and indicate the presence of these forms of radiation.

## 6. What does the unit "Rem" measure in radiation contexts?

- A. Activity
- B. Dose in air
- C. Dose in man**
- D. Intensity

The unit "Rem" is a measure of dose equivalent in radiation contexts, specifically indicating the biological effect of radiation on human tissue. It accounts for the type of radiation and its potential to cause harm, making it especially relevant in protecting human health from radiation exposure. The Rem is used to quantify the amount of energy absorbed by tissue and to evaluate the risk of radiation-related health effects, which is why the correct answer highlights its association with the dose in humans. In contrast, activity pertains to the rate of radioactive decay and is measured in units like the Curie or Becquerel, which do not consider biological effects. Dose in air typically refers to the exposure of air to radiation without factoring in biological impact on tissue, which is distinct from the human focus of the Rem. Intensity measures the strength of radiation in a certain area, but again does not take into account the biological effects on living organisms. Thus, the Rem serves a critical role in assessing potential risks to human health from radiation exposure.

**7. What is a common method to verify the integrity of a gamma radiography source?**

- A. Conducting regular performance checks**
- B. Storing it in a larger container**
- C. Utilizing it only at night**
- D. Cleaning it with chemical solutions**

Conducting regular performance checks is essential for verifying the integrity of a gamma radiography source. These checks ensure that the source is functioning properly and that it remains within the specified performance parameters. This practice is crucial for maintaining safety standards, as it helps detect any potential issues such as degradation or malfunction of the source that could affect its effectiveness and safety during radiographic operations. Regular performance checks typically involve examining the source for physical damage, measuring its activity level, and ensuring that the shielding and other safety components are intact. This proactive approach is vital for both the operator's safety and the quality of the radiographic inspection being performed. In contrast, the other options do not provide an effective means of assessing the integrity of the gamma radiography source. Storing it in a larger container does not contribute to performance verification; utilizing it only at night is irrelevant to its integrity, and cleaning it with chemical solutions could potentially damage the source or its protective components. Thus, regular performance checks stand out as the best practice for ensuring the reliability and safety of gamma radiography sources.

**8. Using a Cobalt 60 source, if you determine the exposure time required to give the desired results for a certain set-up, in two years how much will your exposure time need to be increased to achieve the same results?**

- A. 100% longer**
- B. 60% longer**
- C. 40% longer**
- D. 15% longer**

When using a radioactive source like Cobalt 60, it is essential to understand how the activity of the source diminishes over time due to its half-life. Cobalt 60 has a half-life of approximately 5.27 years, meaning that after this period, the intensity of radiation emitted by the source will be reduced by half. In the scenario where you have determined an initial exposure time required to achieve the desired results, after two years, the amount of radiation emitted from the source will decrease, necessitating an adjustment in exposure time to achieve the same results. After two years, which is approximately 38% of the half-life of Cobalt 60, the exposure time would need to be increased. To calculate the increased exposure time, one can understand that approximately 65% of the original activity remains after two years (because after one half-life, only 50% remains, and you will be slightly above that after two years, due to the mathematical decline of exponential decay). This means that the exposure time will need to be adjusted to maintain the same level of exposure, and this is where the 40% increase comes into play. Over two years, the source has lost some of its effectiveness, which results in the need to

**9. Why is it important to report any radiation incident immediately?**

- A. To document the incident for future reference**
- B. To ensure quick investigation and minimize health risks**
- C. To assess damage to equipment**
- D. To determine the cost of the incident**

Reporting any radiation incident immediately is vital primarily to ensure a swift investigation and to minimize potential health risks. Quick reporting facilitates prompt action from qualified personnel who can assess the situation and take necessary steps to protect individuals from exposure or further hazards. Rapid response can prevent the escalation of an incident that might lead to increased radiation exposure or contamination, further protecting the health and safety of workers and the public. It also allows for immediate implementation of safety protocols which might include evacuations, treatment protocols for those exposed, and contamination control measures. This proactive approach is critical in any situation involving radiation, where even a short delay could lead to significant adverse effects on health and safety. It goes beyond merely documenting the incident for future reference, assessing equipment damage, or determining costs, focusing instead on immediate action to safeguard individuals and ensure compliance with safety regulations and standards.

**10. During industrial radiography operations, what is the purpose of an alarm ratemeter?**

- A. To measure radiation intensity**
- B. To signal high radiation levels**
- C. To record gamma exposure**
- D. To calibrate the exposure device**

An alarm ratemeter plays a critical role in ensuring safety during industrial radiography operations by monitoring radiation levels in real-time. Its primary purpose is to provide a signal when radiation intensity exceeds a predetermined threshold, indicating that high radiation levels are present. This alert system allows radiographers to take immediate action, such as retreating to a safe distance or using protective measures, thus helping to prevent overexposure to radiation. While measuring radiation intensity and recording gamma exposure are important functions in the radiography process, these tasks are typically performed by different instruments that provide quantitative data rather than immediate safety alerts. The calibration of exposure devices is also a separate procedure aimed at ensuring accurate and reliable operation of the equipment used for radiography but does not directly relate to the real-time monitoring aspect of an alarm ratemeter. Ultimately, the focus of this device is on signaling potential hazards, making it essential for maintaining safe working conditions in environments where radiation is present.

## 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](mailto:hello@examzify.com).**

**Or visit your dedicated course page for more study tools and resources:**

**<https://texas-insustrialradiographygamma.examzify.com>**

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

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