

ASNT RADIOGRAPHIC TESTING (RT) LEVEL II PRACTICE TEST (SAMPLE)

STUDY GUIDE



**SAMPLE STUDY GUIDE
WITH LIMITED QUESTIONS**

**VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE**

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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. How can mottling caused by diffraction be reduced when radiographing large-grained metallic specimens?**
 - A. By lowering the exposure time
 - B. By using lead foil screens and raising the kilovoltage
 - C. By increasing the source-to-film distance
 - D. By using a coarser grain film
- 2. What are two significant obstacles to high-intensity fluoroscopy?**
 - A. Cost of equipment and maintenance
 - B. Limited brightness and large grain size of fluoroscopic screens
 - C. Use of lead shields and patient movement
 - D. Color accuracy and image resolution
- 3. What fundamental concept underlies the measurement of backscatter radiation in radiography?**
 - A. Density differences in materials
 - B. Angle of incidence
 - C. Shielding effectiveness
 - D. Reflection and refraction
- 4. What is the shape of the characteristic curve of an x-ray film dependent on?**
 - A. The quality of x or gamma radiation
 - B. The exposure time
 - C. The processing chemicals used
 - D. The film itself
- 5. What is the change called when x-rays, gamma rays, light, or electrons strike photographic emulsion?**
 - A. Visible image
 - B. Latent image
 - C. Shadow image
 - D. Radiant image

- 6. What is the term used to describe the quantitative measure of film blackening?**
- A. Exposure level
 - B. Photographic density
 - C. Radiographic clarity
 - D. Contrast ratio
- 7. Why must exposure time increase by a factor of four when the source-to-film distance is doubled?**
- A. Because of film saturation
 - B. Because intensity is directly proportional to distance
 - C. Because intensity is inversely proportional to the square of the distance
 - D. Because of film density changes
- 8. Which two factors greatly affect the suitability of target material in an X-ray tube?**
- A. Melting point and atomic radius
 - B. Atomic number and melting point
 - C. Atomic size and stability
 - D. Density and atomic weight
- 9. What is the approximate practical thickness limit for a cobalt-60 gamma ray source?**
- A. 6 inches of steel
 - B. 9 inches of steel
 - C. 12 inches of steel
 - D. 15 inches of steel
- 10. What is the most commonly used target material in an X-ray tube?**
- A. Lead
 - B. Tungsten
 - C. Molybdenum
 - D. Gold

Answers

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

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Explanations

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1. How can mottling caused by diffraction be reduced when radiographing large-grained metallic specimens?

- A. By lowering the exposure time
- B. By using lead foil screens and raising the kilovoltage**
- C. By increasing the source-to-film distance
- D. By using a coarser grain film

Mottling caused by diffraction occurs in radiographic imaging when large grains in the specimen scatter the incoming radiation in various directions, leading to a grainy or mottled appearance on the radiograph. By using lead foil screens and raising the kilovoltage, this effect can be minimized. Using lead foil screens helps to absorb scattered radiation, thus reducing the amount of scatter that reaches the film or digital detector. This results in a clearer image with less mottled appearance. The addition of raising the kilovoltage further enhances the penetration ability of the X-rays. Higher kilovoltage produces higher energy X-rays, which are less likely to be scattered by the large grains, leading to improved image quality. The combination of these two actions—using lead foil screens and increasing the kilovoltage—produces a more consistent and cleaner radiographic image, effectively reducing the impact of diffraction and mottling associated with large-grained metallic specimens.

2. What are two significant obstacles to high-intensity fluoroscopy?

- A. Cost of equipment and maintenance
- B. Limited brightness and large grain size of fluoroscopic screens**
- C. Use of lead shields and patient movement
- D. Color accuracy and image resolution

The chosen answer highlights two critical challenges associated with high-intensity fluoroscopy: limited brightness and large grain size of fluoroscopic screens. In high-intensity fluoroscopy, achieving a bright and clear image is essential for accurate diagnosis and assessment. Limited brightness can hinder the visibility of details within images, making it difficult for radiologists to interpret results effectively. The image quality is also influenced by the grain size of the fluoroscopic screens. Larger grain sizes can result in a grainy or less detailed image, further compromising diagnostic accuracy. This interplay between brightness and grain size is crucial because it affects the overall efficacy of fluoroscopic examinations, particularly in situations where high detail is required. Understanding these factors is vital for professionals in radiographic testing, as they directly impact the quality and effectiveness of the imaging process. Maintaining high image quality is a priority in clinical practice, which makes addressing these limitations particularly important.

3. What fundamental concept underlies the measurement of backscatter radiation in radiography?

- A. Density differences in materials
- B. Angle of incidence
- C. Shielding effectiveness
- D. Reflection and refraction

The fundamental concept behind the measurement of backscatter radiation in radiography is centered on density differences in materials. In radiographic testing, the way that X-rays or gamma rays interact with different materials can reveal crucial information about their internal structure. When radiation passes through a material, it is absorbed or scattered based on the density and composition of that material. Backscatter radiation specifically occurs when the incident radiation strikes a surface and bounces back toward the source. The amount of backscatter detected can indicate variations in density within the material. For instance, denser areas will absorb more radiation and reflect less, while less dense areas will allow more radiation to scatter back, thus affecting the radiographic image. This understanding is pivotal for interpreting radiographic images accurately, as the differences in density are also what allow radiographers to identify potential flaws or inconsistencies within a test specimen. Understanding the relationship between density differences and backscatter radiation therefore reinforces the ability to evaluate and contrast material integrity through radiographic techniques.

4. What is the shape of the characteristic curve of an x-ray film dependent on?

- A. The quality of x or gamma radiation
- B. The exposure time
- C. The processing chemicals used
- D. The film itself

The shape of the characteristic curve of an x-ray film is fundamentally dependent on the quality of the radiation used, which includes factors such as its energy, wavelength, and overall radiation type (x-ray or gamma). The characteristic curve, also known as the H&D curve (H & D for Hurter and Driffield), illustrates the relationship between the exposure of film to radiation and the resultant optical density after processing. When the quality of the incoming radiation changes, it directly impacts how the film responds to exposure. Higher energy radiation can penetrate the emulsion more effectively, thereby affecting the film's response and altering the shape of the characteristic curve. This, in turn, influences how much density is produced for a given level of exposure, leading to different interpretations of the curve's slope and shape based on film sensitivity and latitude. The other factors listed, while they can influence the overall performance and quality of the image produced, do not primarily determine the inherent shape of the characteristic curve itself. For example, exposure time and processing chemicals can affect image quality and contrast but do not alter the fundamental relationship represented in the characteristic curve. The film itself has a composition that defines its characteristics, yet it is ultimately the quality of the radiation that dictates the curve's shape.

5. What is the change called when x-rays, gamma rays, light, or electrons strike photographic emulsion?

- A. Visible image
- B. Latent image**
- C. Shadow image
- D. Radiant image

When x-rays, gamma rays, light, or electrons strike photographic emulsion, the resulting change is known as a latent image. This process involves the interaction of radiation with the photographic emulsion, which consists of silver salts that become energized and undergo a chemical change upon exposure to radiation. However, this change is not immediately visible; it requires further development to transform the latent image into a visible one. The term "latent" refers to something that is present but not yet visible. In the context of radiography, the latent image represents the unrevealed pattern of exposure that will later be developed into a visible image through chemical processing. This is a critical concept in radiographic testing, as understanding the nature of the latent image is essential for interpreting radiographs correctly. The other terms do not accurately describe this process. A visible image refers to the final product after development, while shadow image and radiant image are not standard terms used in the context of photographic emulsion and radiographic imaging. Thus, the concept of a latent image is key to understanding how the radiographic process captures and eventually reveals the information contained in the initial exposure.

6. What is the term used to describe the quantitative measure of film blackening?

- A. Exposure level
- B. Photographic density**
- C. Radiographic clarity
- D. Contrast ratio

The term that refers to the quantitative measure of film blackening is photographic density. Photographic density is a measure of the degree of blackening on the film after it has been exposed to radiation and processed. It is expressed in logarithmic terms, typically using a scale that quantifies the amount of light that passes through the film. The increased density indicates more radiation exposure, resulting in a darker film, which plays a crucial role in interpreting the radiographs produced during radiographic testing. Understanding photographic density is essential in radiographic testing because it allows technicians to assess the quality of the film and the adequacy of the exposure. A higher photographic density means a stronger image, which aids in identifying defects or irregularities in the material being tested. This understanding is foundational in ensuring accurate interpretations in non-destructive testing practices.

7. Why must exposure time increase by a factor of four when the source-to-film distance is doubled?

- A. Because of film saturation
- B. Because intensity is directly proportional to distance
- C. Because intensity is inversely proportional to the square of the distance**
- D. Because of film density changes

The correct answer is based on the principle known as the inverse square law, which states that the intensity of radiation is inversely proportional to the square of the distance from the source. As the distance from the source to the film increases, the radiation spreads out over a larger area, leading to a decrease in intensity. When the source-to-film distance is doubled, the radiation intensity decreases to one-fourth of what it was at the original distance. This means that to maintain the same exposure on the film, the exposure time must be increased by a factor of four to compensate for this reduction in intensity. By increasing the exposure time, you ensure that the film receives enough radiation to achieve the desired density and image quality. This understanding of the relationship between exposure time and distance is crucial in radiographic testing, as it directly affects the quality and readability of the radiographic images produced.

8. Which two factors greatly affect the suitability of target material in an X-ray tube?

- A. Melting point and atomic radius
- B. Atomic number and melting point**
- C. Atomic size and stability
- D. Density and atomic weight

The suitability of target material in an X-ray tube is primarily influenced by its atomic number and melting point. The atomic number is crucial because it determines the material's ability to absorb and generate X-rays. A higher atomic number results in greater X-ray production and better energy resolution, making materials like tungsten, which has a high atomic number, excellent targets. The melting point is equally important because the target material must withstand the intense heat generated during the X-ray production process without deforming or melting. High melting point materials maintain their structural integrity, ensuring consistent performance and longevity of the X-ray tube. Together, these two factors—atomic number and melting point—ensure optimal X-ray generation and durability of the target material under operational conditions, making them the primary considerations for suitability in an X-ray tube.

9. What is the approximate practical thickness limit for a cobalt-60 gamma ray source?

- A. 6 inches of steel
- B. 9 inches of steel**
- C. 12 inches of steel
- D. 15 inches of steel

The practical thickness limit for a cobalt-60 gamma ray source is typically around 9 inches of steel. Cobalt-60 is a commonly used gamma ray source in radiographic testing due to its high energy and penetrating power. When assessing the depth of penetration into steel, it is important to recognize that very dense materials, like steel, significantly attenuate gamma radiation. The thickness of steel that cobalt-60 can effectively penetrate is influenced by several factors, including the energy of the emitted gamma rays (which is approximately 1.17 and 1.33 MeV for cobalt-60) and the material composition. With adequate shielding, approximately up to 9 inches of steel is achievable in practical applications without excessive loss of resolution or quality in the radiographic imagery. Beyond this thickness, the ability to obtain clear and usable radiographs diminishes because the radiation becomes increasingly absorbed, leading to reduced image contrast and definition. Thus, 9 inches of steel represents a balance between effective penetration for quality radiographic inspection and the limitations imposed by material attenuation.

10. What is the most commonly used target material in an X-ray tube?

- A. Lead
- B. Tungsten**
- C. Molybdenum
- D. Gold

The most commonly used target material in an X-ray tube is tungsten. This choice is correct because tungsten has a high atomic number and a high melting point, making it particularly effective for producing X-rays. The atomic number of tungsten (74) allows for efficient X-ray production, as it can generate high-energy photons when electrons strike it. Its high melting point (over 3,400°C) ensures that it withstands the intense heat generated during operation without degrading or melting. Furthermore, tungsten is also beneficial due to its density, which contributes to better X-ray production and higher quality images. This makes tungsten ideal for use in various X-ray equipment across medical, industrial, and research applications. On the other hand, while lead, molybdenum, and gold possess specific applications in X-ray technology—such as lead for shielding due to its ability to absorb X-rays and protect operators or molybdenum for use in mammography due to its lower X-ray energy spectrum—their properties do not make them suitable as the primary target material in X-ray tubes. Thus, tungsten remains the primary choice for this purpose in X-ray tube manufacturing.

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://asntrtlvl2.examzify.com>

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

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