

# RTBC Image Evaluation and Quality Control (122) Practice Exam (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. How is the spatial resolution of a radiographic system measured?**
  - A. In pixels per inch (ppi)**
  - B. In line-pairs per millimeter (lp/mm)**
  - C. In percentage of contrast**
  - D. In units of exposure time**
  
- 2. How is source-to-object distance (SOD) calculated?**
  - A. Object-to-image distance (OID) + focal spot size (FSS)**
  - B. Source-to-image distance (SID) - object-to-image distance (OID)**
  - C. Source-to-image distance (SID) + object-to-image distance (OID)**
  - D. Source-to-object distance (SOD) + tube angulation**
  
- 3. Which combination would produce an image with the highest spatial resolution?**
  - A. Large DEL size, large DEL pitch, low fill factor**
  - B. Small DEL size, large DEL pitch, high fill factor**
  - C. Small DEL size, small DEL pitch, high fill factor**
  - D. Moderate DEL size, small DEL pitch, moderate fill factor**
  
- 4. What impact does a longer SID have on patient exposure?**
  - A. Increases patient exposure**
  - B. Decreases patient exposure**
  - C. No effect on patient exposure**
  - D. Only affects the image quality**
  
- 5. What pathology is indicated by distended loops of air-filled bowel and increased subject contrast throughout the abdomen?**
  - A. Gastroparesis**
  - B. Bowel obstruction**
  - C. Diverticulitis**
  - D. Appendicitis**

- 6. What does a high deviation index indicate in radiography?**
- A. Excessive exposure**
  - B. Inadequate exposure**
  - C. Optimal exposure**
  - D. Poor image quality**
- 7. Which type of projection is typically employed to demonstrate elongation of anatomical structures?**
- A. Posteroanterior (PA) projection**
  - B. Axial projection with an angle**
  - C. Lateral projection with no angle**
  - D. Oblique projection**
- 8. What variable change would increase receptor exposure in a chest x-ray taken with a 12:1 grid?**
- A. Increase grid ratio**
  - B. Decrease grid ratio**
  - C. Increase filtration**
  - D. Decrease exposure time**
- 9. Which factor is considered most influential on the contrast of the radiographic image?**
- A. Lighting conditions**
  - B. Film type**
  - C. Computer processing**
  - D. Patient positioning**
- 10. Which important image quality factor is described as the structural sharpness recorded in the radiographic image?**
- A. Contrast resolution**
  - B. Spatial resolution**
  - C. Temporal resolution**
  - D. Dynamic range**

## Answers

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

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## **Explanations**

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## 1. How is the spatial resolution of a radiographic system measured?

- A. In pixels per inch (ppi)
- B. In line-pairs per millimeter (lp/mm)**
- C. In percentage of contrast
- D. In units of exposure time

The spatial resolution of a radiographic system is measured in line-pairs per millimeter (lp/mm) because this unit reflects the system's ability to distinguish between two closely spaced objects. Spatial resolution pertains to how well the details of an image can be resolved, which is crucial in radiography where clarity is essential for accurate diagnoses. Line-pairs represent the smallest distance between two lines that can be distinguished as separate, making lp/mm a direct measure of the capability of the imaging system to provide detailed information. A higher value of line pairs indicates better resolution, meaning the system can capture finer details. In contrast, other units of measurement listed, such as pixels per inch (ppi), primarily pertain to digital imaging clarity but do not effectively represent the actual resolving power in terms of radiographic systems. Similarly, contrast percentage and exposure time do not relate to spatial resolution directly. Contrast percentage deals with the difference in density between areas of an image, while exposure time refers to the duration of radiation exposure, neither of which measures the sharpness or detail-resolving ability of the imaging system.

## 2. How is source-to-object distance (SOD) calculated?

- A. Object-to-image distance (OID) + focal spot size (FSS)
- B. Source-to-image distance (SID) - object-to-image distance (OID)**
- C. Source-to-image distance (SID) + object-to-image distance (OID)
- D. Source-to-object distance (SOD) + tube angulation

Source-to-object distance (SOD) is a crucial measurement in radiographic imaging that determines how far the x-ray source is from the object being imaged. The calculation of SOD can be derived from the relationship of several distances involved in the imaging process. The source-to-image distance (SID) represents the distance from the x-ray tube to the image receptor, while the object-to-image distance (OID) is the distance from the object being studied to the image receptor. To find the SOD, you can rearrange the primary distance equation. Specifically, since the SID can be understood as the sum of the SOD and OID, the formula can be expressed as  $SOD = SID - OID$ . This logical derivation leads to the correct calculation of SOD, confirming that the second provided choice accurately reflects this relationship. Understanding this relationship is vital for ensuring optimal imaging parameters, as variations in these distances can affect image quality and radiation dose.

**3. Which combination would produce an image with the highest spatial resolution?**

- A. Large DEL size, large DEL pitch, low fill factor**
- B. Small DEL size, large DEL pitch, high fill factor**
- C. Small DEL size, small DEL pitch, high fill factor**
- D. Moderate DEL size, small DEL pitch, moderate fill factor**

To achieve the highest spatial resolution in imaging, it's essential to consider the parameters that impact detail clarity and the ability to distinguish small structures. The correct choice highlights the importance of having a small detector element (DEL) size combined with a small DEL pitch and a high fill factor. A small DEL size allows for finer sampling of the image, which means that more detailed information can be captured. When the DEL size is small, it can detect smaller features in the image, thus enhancing spatial resolution. Additionally, a small DEL pitch ensures that the spacing between each DEL is minimized. This tight arrangement allows the system to capture more pixels over a given area, further contributing to the detail and clarity of the image. A high fill factor indicates that a greater proportion of the detector is sensitive to incoming radiation, which improves the efficiency and quality of the resultant image. This means more of the detected signal contributes to the final image, enhancing its overall quality. In summary, the combination of a small DEL size, small DEL pitch, and high fill factor is optimal for producing images with the highest spatial resolution, allowing for clearer and more detailed images suitable for diagnostic purposes.

**4. What impact does a longer SID have on patient exposure?**

- A. Increases patient exposure**
- B. Decreases patient exposure**
- C. No effect on patient exposure**
- D. Only affects the image quality**

A longer source-to-image distance (SID) results in decreased patient exposure. This phenomenon occurs due to the inverse square law, which states that the intensity of radiation (and therefore the exposure to the patient) is inversely proportional to the square of the distance from the radiation source. As the SID increases, the X-ray beam spreads over a larger area, which effectively reduces the intensity of the radiation that reaches the patient. Therefore, with a longer SID, there will be less radiation exposure to the patient's tissues, making it a critical consideration for optimizing patient safety during imaging procedures. This aspect of radiation physics is essential in radiographic practice, as it helps in balancing the need for diagnostic quality images with minimizing patient dose.

**5. What pathology is indicated by distended loops of air-filled bowel and increased subject contrast throughout the abdomen?**

**A. Gastroparesis**

**B. Bowel obstruction**

**C. Diverticulitis**

**D. Appendicitis**

The indication of distended loops of air-filled bowel, along with increased subject contrast throughout the abdomen, suggests the presence of bowel obstruction. In this condition, the normal passage of intestinal contents is hindered, leading to the accumulation of gas and fluid in the bowel. This accumulation causes the loops of bowel to become distended, which can be clearly visualized in imaging studies. Furthermore, the increase in subject contrast can be attributed to the significant difference in density between the air-filled bowel and the surrounding structures, making the signs of obstruction more pronounced. In cases of bowel obstruction, there might also be associated signs such as the absence of gas in distal bowel segments, depending on the type and location of the obstruction. While the other conditions listed, like gastroparesis, diverticulitis, and appendicitis, can present with some bowel changes, they typically do not result in the same pronounced pattern of distension and contrast as seen in bowel obstruction. Each of these other conditions has its own specific imaging characteristics that differ from those of a bowel obstruction.

**6. What does a high deviation index indicate in radiography?**

**A. Excessive exposure**

**B. Inadequate exposure**

**C. Optimal exposure**

**D. Poor image quality**

A high deviation index in radiography indicates that there has been excessive exposure during the imaging process. The deviation index is a measurement that compares the amount of radiation exposure received by the image receptor to the amount that is considered optimal for that particular examination. When the deviation index is high, it shows that the actual exposure is greater than the target exposure levels recommended for achieving a diagnostic-quality image. This can result in overexposure, which can lead to increased patient dose and may affect the overall image quality by causing issues such as saturation of the image, loss of detail in bright areas, and poor contrast. In contrast, a low deviation index would suggest inadequate exposure, where the image may be underexposed and lack sufficient information for proper diagnosis. An optimal deviation index indicates that the exposure was within the recommended range, leading to the potential for high-quality images, while poor image quality can result from various factors unrelated to the deviation index itself, such as motion artifacts or technical errors during the image acquisition process.

**7. Which type of projection is typically employed to demonstrate elongation of anatomical structures?**

- A. Posteroanterior (PA) projection**
- B. Axial projection with an angle**
- C. Lateral projection with no angle**
- D. Oblique projection**

The axial projection with an angle is the correct choice for demonstrating elongation of anatomical structures. This technique involves positioning the X-ray beam at an angle to the body part of interest, which can effectively project the structure along its longitudinal axis. The angling of the beam can help to minimize superimposition and spatial distortion of the anatomy, leading to a clearer representation of elongated structures. In imaging, certain projections can accentuate or foreshorten anatomical features, but the axial projection with an angle specifically allows for enhanced visualization of these elongated structures. By adjusting the angle of the X-ray beam, practitioners can manipulate the way that anatomy is represented on the film, which is particularly useful in areas where elongation is a significant characteristic of the structures being imaged, such as in long bones or elongated organs. Other projection types, while useful for various imaging purposes, do not primarily serve to elongate anatomical structures in the same way. For example, the posteroanterior projection mainly shows a two-dimensional image of the anatomy in the coronal plane rather than elongation. Lateral projections typically depict the anatomy from the side without alterations to structure elongation. Oblique projections may offer some elongation but are more often useful for visualizing structures in

**8. What variable change would increase receptor exposure in a chest x-ray taken with a 12:1 grid?**

- A. Increase grid ratio**
- B. Decrease grid ratio**
- C. Increase filtration**
- D. Decrease exposure time**

To increase receptor exposure in a chest x-ray taken with a 12:1 grid, decreasing the grid ratio is an effective approach. A grid is used in radiography to reduce scatter radiation and improve image contrast. However, grids also absorb some of the primary radiation that contributes to receptor exposure. A 12:1 grid has a high ratio and will absorb a significant amount of primary radiation. When the grid ratio is decreased, less primary radiation is absorbed, allowing more of the useful radiation to reach the receptor. This results in increased receptor exposure, as the reduction in grid ratio reduces the amount of primary beam attenuation. In contrast, increasing the grid ratio would further reduce receptor exposure because it would lead to more significant absorption of primary radiation. Increasing filtration would also decrease receptor exposure by removing lower-energy photons that do not contribute effectively to the image quality. Decreasing exposure time could reduce receptor exposure by minimizing the amount of radiation delivered regardless of other settings. Thus, decreasing the grid ratio is the most effective variable adjustment to increase receptor exposure in this scenario.

**9. Which factor is considered most influential on the contrast of the radiographic image?**

- A. Lighting conditions**
- B. Film type**
- C. Computer processing**
- D. Patient positioning**

The contrast of a radiographic image is primarily influenced by several key factors, among which computer processing stands out as particularly significant in modern imaging techniques. This factor involves the digital manipulation of an acquired image to enhance its visual quality and clarity. Computer processing allows for advanced algorithms to analyze the raw data collected by the imaging device and adjust elements like brightness and contrast levels, which can significantly impact how well the different densities within the radiograph are represented. By adjusting these factors, computer processing enhances the visibility of anatomical structures and potential abnormalities, leading to a clearer diagnostic image. While film type, lighting conditions, and patient positioning contribute to the overall quality of a radiographic image, they do not provide the same degree of control or refinement that computer processing offers. Film type might influence the initial image capture and its inherent contrast capabilities but lacks the flexibility of digital manipulation. Similarly, lighting conditions play a role primarily in film-based radiography environments rather than in the image contrast itself once the image is captured. Patient positioning, while critical in ensuring that the area of interest is adequately visualized, does not directly alter the contrast inherent in the imaging process. Thus, computer processing is the most influential factor influencing the contrast of a radiographic image, particularly in digital radiography.

**10. Which important image quality factor is described as the structural sharpness recorded in the radiographic image?**

- A. Contrast resolution**
- B. Spatial resolution**
- C. Temporal resolution**
- D. Dynamic range**

The correct choice emphasizes spatial resolution, which is indeed defined as the structural sharpness present in the radiographic image. Spatial resolution refers to the ability of the imaging system to accurately depict the fine details of the structures being examined. Higher spatial resolution means that smaller structures can be distinguished more clearly, which is crucial for accurate diagnosis and assessment in radiography. In imaging, spatial resolution is influenced by several factors, including the size of the detector elements, the configuration of the imaging system, and the inherent properties of the image receptor. A radiographic image with high spatial resolution will allow for better visualization of small anatomical features, contributing significantly to the diagnostic utility of the image. Contrast resolution deals with the ability to differentiate between different intensities of gray in an image, while temporal resolution relates to how quickly an imaging system can acquire images over time. Dynamic range refers to the range of exposure levels that an imaging system can accurately capture. Each of these factors plays a role in image quality but does not specifically refer to the sharpness of structural details, which is why they are not the correct choice in this context.

## 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://rtbcimageevalqc122.examzify.com>**

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

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