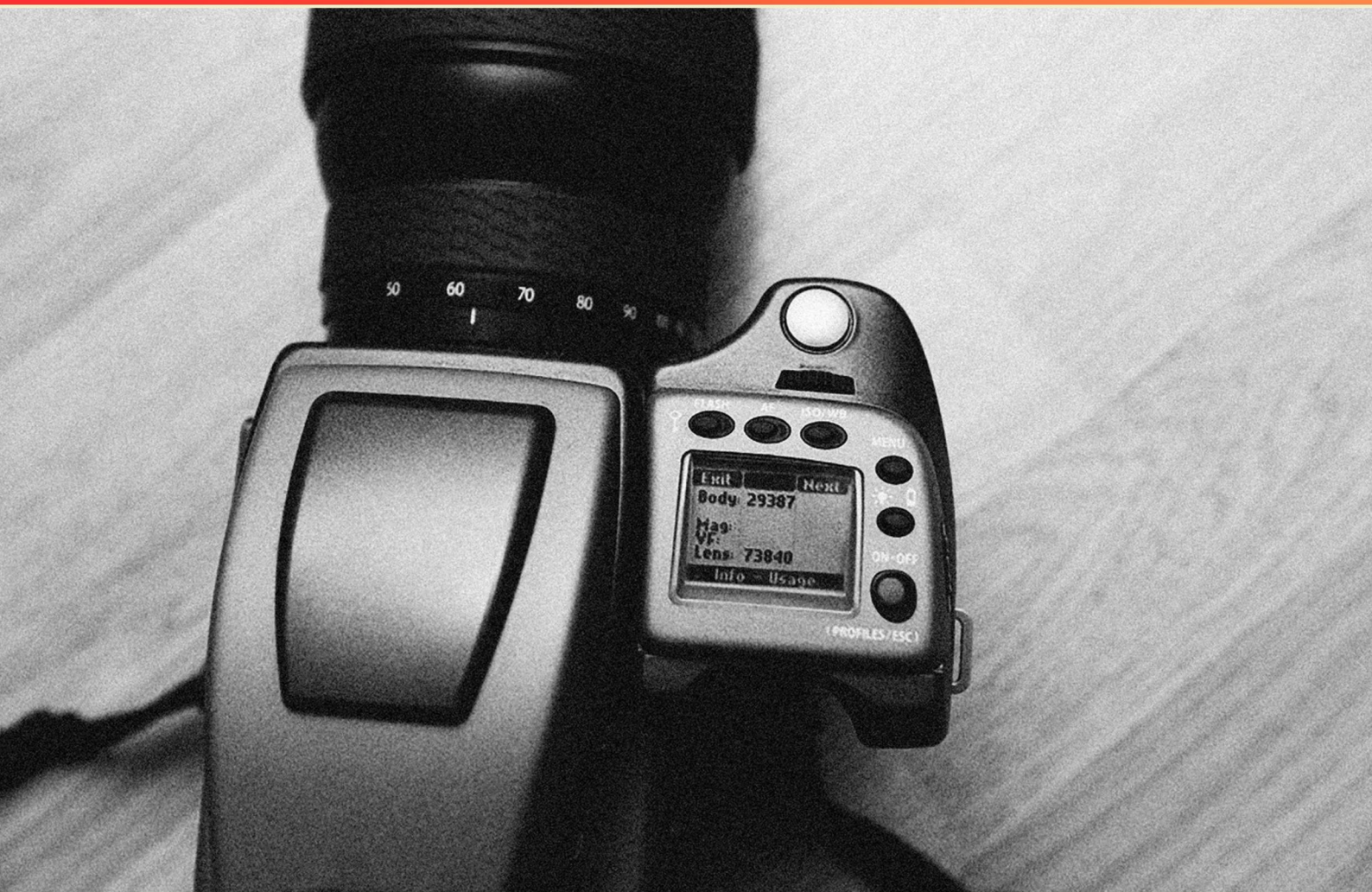


IMAGE ACQUISITION AND TECHNICAL EVALUATION PRACTICE TEST (SAMPLE) STUDY GUIDE



Prepare with structure. Pass with confidence



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Table of Contents

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

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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. What effect does compression of breast tissue during mammography have on image quality?**
 - A. Decreases geometric blurring
 - B. Reduces scattered radiation
 - C. Reduces patient motion
 - D. All of the above
- 2. Which imaging technique uses a photostimulable phosphor as the image receptor?**
 - A. Computed radiography
 - B. Film radiography
 - C. Digital radiography
 - D. Cineradiography
- 3. What is one purpose of using a grid in radiographic imaging?**
 - A. To increase patient exposure.
 - B. To enhance contrast by reducing scatter radiation.
 - C. To allow for longer exposure times.
 - D. To minimize image sharpness.
- 4. Which statement about single-phase and three-phase examinations is incorrect?**
 - A. A single-phase examination done at 10 mAs can be duplicated with three-phase, 12-pulse at 5 mAs.
 - B. There is greater patient dose with three-phase equipment than with single-phase equipment.
 - C. Three-phase equipment can produce comparable radiographs with less heat unit (HU) buildup.
 - D. Three-phase equipment produces lower-contrast radiographs than single-phase equipment.
- 5. If the SID is decreased and an 8:1 grid is added, what would be the expected change in mAs?**
 - A. It would decrease significantly
 - B. It would remain constant
 - C. It would increase
 - D. It would fluctuate randomly

- 6. What phenomenon is responsible for receptor exposure variation between opposite ends of the imaging receptor when using a 30-in. SID?**
- A. Production of quantum mottle
 - B. Receptor exposure variation between opposite ends of the IR
 - C. Production of scatter radiation fog
 - D. Excessively short-scale contrast
- 7. When kilovoltage is increased with appropriate compensation of milliamperere-seconds, what is the result?**
- A. Increased part penetration
 - B. Higher contrast
 - C. Increased receptor exposure
 - D. Decreased image quality
- 8. How does introducing a 6-in. OID affect image contrast?**
- A. Contrast would be increased
 - B. Contrast would be decreased
 - C. Contrast would not change
 - D. The scale of contrast would not change
- 9. What phenomenon occurs when a steep target angle is utilized?**
- A. Increased output
 - B. Improved spatial resolution
 - C. Increased heel effect
 - D. All of the above
- 10. Which of the following is most likely to result from the introduction of a grid to a particular radiographic examination?**
- A. Increased patient dose and increased scattered radiation fog
 - B. Decreased patient dose and decreased scattered radiation fog
 - C. Increased patient dose and decreased scattered radiation fog
 - D. Decreased patient dose and increased scattered radiation fog

Answers

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

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Explanations

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1. What effect does compression of breast tissue during mammography have on image quality?

- A. Decreases geometric blurring
- B. Reduces scattered radiation
- C. Reduces patient motion
- D. All of the above**

Compression of breast tissue during mammography significantly enhances image quality in several interconnected ways. Firstly, it decreases geometric blurring, which is the result of the breast being flattened. By compressing the tissue, the distance between the x-ray source and the detector is minimized, resulting in sharper images. This reduction in geometric blurring is crucial for accurately identifying and diagnosing potential abnormalities. Secondly, compression reduces scattered radiation. When breast tissue is compressed, the x-rays are more uniformly distributed, leading to less scattering of the x-ray beams. This clarity allows for better visualization of the internal structures of the breast, making it easier for radiologists to interpret the mammogram. Lastly, compression helps to reduce patient motion. A more stable imaging environment is created when the breast is compressed, minimizing any movements during the image capture. This stability is essential for producing high-quality diagnostic images, as motion can blur the details and obscure potential findings. Thus, by improving image clarity through these mechanisms, compression during mammography plays a vital role in optimizing overall image quality, leading to more accurate diagnostics.

2. Which imaging technique uses a photostimulable phosphor as the image receptor?

- A. Computed radiography**
- B. Film radiography
- C. Digital radiography
- D. Cineradiography

Computed radiography is the imaging technique that uses a photostimulable phosphor as the image receptor. This technology involves the use of imaging plates coated with a phosphor material, which captures X-ray images when they are exposed to radiation. After the exposure, the plate is processed in a reader that stimulates the phosphor with a laser beam, causing it to emit light. This emitted light is then converted into an electronic signal to create a digital image. This technique allows for the advantages of digital imaging—such as enhanced image quality, the ability to manipulate images post-acquisition, and reduced patient dose—while still using a method that originally captures data similar to traditional film.

3. What is one purpose of using a grid in radiographic imaging?

- A. To increase patient exposure.
- B. To enhance contrast by reducing scatter radiation.**
- C. To allow for longer exposure times.
- D. To minimize image sharpness.

Using a grid in radiographic imaging primarily serves to enhance contrast by reducing scatter radiation. When X-rays pass through the patient, some of them are scattered in different directions due to interactions with tissues. This scattered radiation can contribute to fogging the image, thereby reducing contrast and overall image quality. A grid is a device made up of thin lead strips arranged in a way that only allows the primary X-ray beam to pass through while absorbing a significant portion of the scattered radiation. By doing this, the grid helps maintain the clarity and contrast of the image, which is crucial for accurate diagnosis. The other options do not correspond with the purpose of using a grid in radiographic imaging. For example, increasing patient exposure is undesirable as it raises the risk of radiation-related issues. Allowing for longer exposure times is not the primary function of a grid; in fact, grids often allow for shorter exposure times by improving image quality. Lastly, minimizing image sharpness runs counter to the goal of radiographic imaging, which is to achieve clear and detailed images for better diagnostic evaluation.

4. Which statement about single-phase and three-phase examinations is incorrect?

- A. A single-phase examination done at 10 mAs can be duplicated with three-phase, 12-pulse at 5 mAs.
- B. There is greater patient dose with three-phase equipment than with single-phase equipment.**
- C. Three-phase equipment can produce comparable radiographs with less heat unit (HU) buildup.
- D. Three-phase equipment produces lower-contrast radiographs than single-phase equipment.

The statement indicating that there is greater patient dose with three-phase equipment than with single-phase equipment is inaccurate because it overlooks the fundamental differences in how the two systems operate. Generally, three-phase equipment is designed to deliver more consistent and efficient x-ray output compared to single-phase systems. This consistency allows for better management of radiation dose, often resulting in lower radiation exposure for patients when equivalent images are produced. When using three-phase equipment, the increased efficiency means that the same image quality can often be achieved with a lower mAs setting, which in turn can reduce the overall radiation dose delivered to the patient. The other statements highlight various aspects of the differences between single-phase and three-phase systems. For example, a single-phase examination at a higher mAs can indeed be matched by a three-phase system at a lower mAs due to its improved output, while three-phase systems typically manage heat more effectively and can produce images that are comparable in quality without sacrificing patient safety. Additionally, the contrast of the radiographs produced by three-phase systems can differ based on other technical factors, making broad generalizations about contrast not applicable without context.

5. If the SID is decreased and an 8:1 grid is added, what would be the expected change in mAs?

- A. It would decrease significantly
- B. It would remain constant
- C. It would increase**
- D. It would fluctuate randomly

When the source-to-image distance (SID) is decreased, the primary effect is an increase in the intensity of the radiation reaching the image receptor because the x-rays are closer to the target. However, adding an 8:1 grid introduces a factor that requires more mAs (milliampere-seconds) to achieve the same level of image density since grids absorb a portion of the x-rays to reduce scatter. The combination of decreasing the SID, which would typically reduce the necessary exposure, and adding a grid, which necessitates an increase in exposure due to its attenuation of x-rays, leads to an overall increase in the required mAs. The grid's design and its ratio (in this case, 8:1) play a significant role in determining how much additional mAs is required to maintain image quality. Thus, while reducing SID alone might lower the exposure needed, the presence of the grid means that the mAs must be increased to compensate for the loss of transmitted x-rays, resulting in an expected increase in mAs when these two factors are combined.

6. What phenomenon is responsible for receptor exposure variation between opposite ends of the imaging receptor when using a 30-in. SID?

- A. Production of quantum mottle
- B. Receptor exposure variation between opposite ends of the IR**
- C. Production of scatter radiation fog
- D. Excessively short-scale contrast

The phenomenon responsible for receptor exposure variation between opposite ends of the imaging receptor when using a 30-inch Source-to-Image Distance (SID) is primarily related to the uneven distribution of exposure across the receptor, often referred to as a geometry or alignment issue during image acquisition. When imaging at extended distances, variations can occur due to factors like beam divergence and the angle of incidence on the imaging receptor. As the X-ray beam travels from the source, it widens, leading to differences in intensity and exposure from one side of the receptor to the other. This can create a situation where parts of the receptor receive significantly different amounts of radiation. Such variations can manifest as localized areas of overexposure or underexposure across the receptor's surface, ultimately impacting the quality of the resulting image. Understanding this phenomenon is crucial in diagnostic imaging to ensure consistent and accurate depiction of anatomical structures. This contrast in exposure is not due to factors like quantum mottle, which is related to insufficient exposure and results in grainy images; scatter radiation fog, which typically creates a more uniform degradation of image quality; or excessively short-scale contrast, which deals with the range of grey tones in the image rather than exposure distribution across the receptor.

7. When kilovoltage is increased with appropriate compensation of milliamperere-seconds, what is the result?

- A. Increased part penetration**
- B. Higher contrast
- C. Increased receptor exposure
- D. Decreased image quality

When kilovoltage is increased, while maintaining appropriate compensation of milliamperere-seconds (mAs), the primary result is increased part penetration. Increasing the kilovoltage enhances the quality and energy of the x-ray photons produced, allowing them to pass through denser anatomical structures more effectively. This improved penetration means that more x-rays can pass through the body part being imaged, which is particularly beneficial for thicker or denser areas. Compensating with mAs ensures that adequate overall exposure to the image receptor is maintained. This balance allows for a clearer image without overexposing the patient, combining appropriate energy levels with sufficient quantity of photons to produce a diagnostic-quality radiograph. In summary, the increase in kilovoltage directly correlates with the ability to penetrate tissues better, which is essential for accurate imaging.

8. How does introducing a 6-in. OID affect image contrast?

- A. Contrast would be increased**
- B. Contrast would be decreased
- C. Contrast would not change
- D. The scale of contrast would not change

Introducing a 6-inch object-to-image distance (OID) affects image contrast primarily due to the level of scatter radiation that is captured in the imaging process. When the OID increases, the distance between the object being imaged and the imaging receptor also increases, which helps to reduce the amount of scattered radiation that reaches the detector. This reduction in scattered radiation enhances the visibility of the differences in density within the image, leading to improved contrast. Higher contrast is particularly beneficial in medical imaging because it allows for better differentiation between various tissues or structures within the body. When scatter is minimized, the true exposure density of the structures remains prominent, and image elements are clearer and more distinct. In contrast, a decrease in OID would lead to more scatter reaching the detector, resulting in lower image contrast, as the increased scatter can blur or wash out the differences in density. Thus, an increase in OID creates a more favorable condition for image quality, specifically in the realm of contrast, validating the assertion that contrast would indeed be increased with this change.

9. What phenomenon occurs when a steep target angle is utilized?

- A. Increased output
- B. Improved spatial resolution
- C. Increased heel effect**
- D. All of the above

Utilizing a steep target angle in x-ray tubes primarily enhances the heel effect. The heel effect is a phenomenon where there is a variation in radiation intensity across the radiographic field due to the angled target. When the target angle is steep, it causes more significant absorption of x-rays on the anode side, leading to higher intensity on the cathode side. This results in a more pronounced contrast between the two sides of the beam, where the x-ray intensity diminishes the further away from the anode side you measure. This can affect image quality, as it may cause uneven exposure if not compensated for in imaging techniques, particularly in large field sizes. Although a steep target angle may influence output and spatial resolution, its most notable impact is on the heel effect. Options related to increased output and improved spatial resolution do not specifically relate to the steep target angle in the same defining manner as the heel effect. Therefore, the focus is notably on how a steep target angle exacerbates the heel effect.

10. Which of the following is most likely to result from the introduction of a grid to a particular radiographic examination?

- A. Increased patient dose and increased scattered radiation fog
- B. Decreased patient dose and decreased scattered radiation fog
- C. Increased patient dose and decreased scattered radiation fog**
- D. Decreased patient dose and increased scattered radiation fog

The introduction of a grid in radiographic examinations enhances image quality by effectively reducing the amount of scattered radiation that reaches the film or detector. Scattered radiation can obscure the diagnostic information of a radiograph, creating a fogged appearance. By using a grid, which is designed to absorb some of this scatter while allowing primary radiation to pass through, the resultant image is clearer and has improved contrast. However, the use of a grid often necessitates an increase in radiation dose to the patient. This is primarily because the grid absorbs some of the primary radiation, so to maintain adequate exposure levels for producing diagnostic images, the radiologic technologist must increase the radiation dose. Therefore, introducing a grid results in increased patient exposure while simultaneously reducing scatter, which significantly improves the quality of the image obtained. This combination of increased patient dose and decreased scattered radiation fog makes the correct option clear in the context of how grids function in radiography.

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://imageacquisitiontecheval.examzify.com>

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

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