

MOSBY DIGITAL IMAGE ACQUISITION PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE

<https://mosbydigiimageacquisition.examzify.com>



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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 space from the center of a pixel to the center of the adjacent pixel is called:**
 - A. Pixel Density
 - B. Bit Depth
 - C. Pixel Pitch
 - D. Matrix Depth
- 2. What is the impact of increasing the amount of processing on image quality?**
 - A. It improves visibility of fine detail
 - B. It reduces image histogram width
 - C. It degrades image quality
 - D. It has no effect on image quality
- 3. Why is mAs still a clinically important parameter in digital radiography?**
 - A. It controls the number of photons reaching the detector, influencing receptor exposure, image noise, and overall brightness.
 - B. It determines the X-ray tube housing temperature.
 - C. It sets the detector fill factor.
 - D. It controls histogram width.
- 4. Which term describes the distance between centers of adjacent pixels?**
 - A. Pixel Pitch
 - B. Bit Depth
 - C. Exposure Latitude
 - D. Image Latitude
- 5. Why is monitor calibration important in radiology imaging?**
 - A. It has no impact on diagnosis.
 - B. It ensures the displayed image brightness and contrast reflect the recorded data.
 - C. It ensures patient comfort during viewing.
 - D. It eliminates the need for QA.

- 6. Which metric is used to evaluate the spatial resolution performance of a digital radiography system?**
- A. Noise Power Spectrum
 - B. Contrast-detail analysis
 - C. Dynamic Range
 - D. Modulation Transfer Function
- 7. Mathematical codes used to generate the digital image are called:**
- A. Binary Codes
 - B. Algorithms
 - C. Binary Digits
 - D. Bytes
- 8. Which grid design provides the best scatter cleanup?**
- A. Air Gap Technique
 - B. Focused Grids
 - C. Crosshatch Grids
 - D. Parallel Grids
- 9. What does the Modulation Transfer Function (MTF) describe in radiographic systems?**
- A. MTF describes the detector's dynamic range.
 - B. MTF describes the system's ability to reproduce contrast at different spatial frequencies, reflecting sharpness.
 - C. MTF measures exposure latitude.
 - D. MTF indicates the color depth of the digital image.
- 10. Which term describes a high-contrast image with limited gray tones?**
- A. Long-scale contrast
 - B. Short-scale contrast
 - C. Equal grayscale
 - D. Moderate contrast

Answers

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

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Explanations

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1. The space from the center of a pixel to the center of the adjacent pixel is called:

- A. Pixel Density
- B. Bit Depth
- C. Pixel Pitch**
- D. Matrix Depth

Pixel pitch is the distance from the center of one pixel to the center of the adjacent pixel. This spacing determines how finely the image is sampled: a smaller pitch means more detector elements per area and thus higher spatial resolution, allowing you to resolve finer detail. Pixel density (pixels per unit length) is essentially the inverse of pitch—when pitch gets smaller, density goes up. Bit depth, on the other hand, is about how many gray levels a pixel can show, not how far apart pixels are. Matrix depth (or the size of the image matrix) refers to the number of pixels in the image array, not the physical spacing between pixels. So the center-to-center spacing is correctly described as pixel pitch.

2. What is the impact of increasing the amount of processing on image quality?

- A. It improves visibility of fine detail
- B. It reduces image histogram width
- C. It degrades image quality**
- D. It has no effect on image quality

Increasing the amount of processing tends to degrade image quality. Pushing processing beyond what's appropriate often amplifies noise and artifacts, creates halos or edge-walking from sharpening, and can smear or remove fine texture. While some targeted processing can enhance specific features, applying more processing overall usually makes the image look less faithful to the original and introduces distortions. So the overall effect is a decline in image quality.

3. Why is mAs still a clinically important parameter in digital radiography?

- A. It controls the number of photons reaching the detector, influencing receptor exposure, image noise, and overall brightness.**
- B. It determines the X-ray tube housing temperature.
- C. It sets the detector fill factor.
- D. It controls histogram width.

mAs controls the number of photons reaching the detector, which determines receptor exposure, image noise, and overall brightness. In digital radiography, the detector can handle a wide range of exposures, but image quality still hinges on having enough photons to create a stable signal. More photons lower the relative noise (quantum mottle) and produce a clearer image with appropriate brightness. The energy spectrum and contrast are set by kVp, not mAs, so adjusting mAs tunes quantity, not texture. If exposure is too low, the image looks grainy and hard to interpret; if exposure is too high, patient dose increases without corresponding diagnostic benefit. The other factors are not controlled by mAs: tube housing temperature relates to heat management, detector fill factor is a hardware property, and histogram width arises from post-processing and exposure normalization rather than a direct effect of mAs.

4. Which term describes the distance between centers of adjacent pixels?

- A. Pixel Pitch**
- B. Bit Depth
- C. Exposure Latitude
- D. Image Latitude

Pixel pitch is the distance from the center of one pixel to the center of the adjacent pixel. This measure shows how densely pixels are packed, which directly affects spatial resolution—the smaller the pitch, the more pixels fit into a given area and the finer the detail you can resolve. Keep in mind that other terms describe different aspects: bit depth relates to how many color or gray levels a pixel can store, while exposure latitude and image latitude refer to the range of exposure the image can tolerate. So the distance between centers of adjacent pixels is described by pixel pitch.

5. Why is monitor calibration important in radiology imaging?

- A. It has no impact on diagnosis.
- B. It ensures the displayed image brightness and contrast reflect the recorded data.**
- C. It ensures patient comfort during viewing.
- D. It eliminates the need for QA.

Monitor calibration ensures that what you see on the screen matches the actual recorded image data. Radiographs rely on subtle gray level differences to reveal structures and potential pathology, so the display's brightness, contrast, and tonal response must be consistent and accurate. Calibrating to a standard (such as the DICOM grayscale display function) aligns the monitor's luminance and gamma with the image data, so a given pixel value is shown with the intended brightness regardless of device or ambient light. This keeps window/level adjustments meaningful and ensures consistency across screens and exams, reducing the risk of misinterpretation due to nonuniform or nonstandard display. The other options aren't the purpose of calibration: it does impact diagnosis, it isn't about patient comfort, and calibration is part of quality assurance rather than a replacement for it.

6. Which metric is used to evaluate the spatial resolution performance of a digital radiography system?

- A. Noise Power Spectrum
- B. Contrast-detail analysis
- C. Dynamic Range

D. Modulation Transfer Function

The main idea here is how well a digital radiography system preserves image detail as the level of detail (spatial frequency) increases. The Modulation Transfer Function (MTF) is the tool that quantifies this directly. It describes how the system transfers contrast from the object to the image for patterns of different spatial frequencies. In other words, it tells you how much of the original contrast of fine details is preserved when those details are represented at various sizes in the image. MTF is obtained from the system's impulse response (often described by the point-spread function or line-spread function) and shows how the image modulation (contrast) diminishes as you move to higher frequencies, where finer details reside. A higher MTF at a given frequency means the system preserves contrast for that level of detail better, indicating superior spatial resolution. As frequency increases, the MTF typically decreases, reflecting the limits of the imaging chain to reproduce very fine structures. The other options relate to image quality in different ways but do not directly measure how well the system resolves fine detail across spatial frequencies. Noise Power Spectrum describes how noise is distributed across frequencies, not how detail is transferred. Dynamic range concerns the span between the largest and smallest detectable signals. Contrast-detail analysis evaluates how visible details are across a range of contrasts and sizes, which is more about perceptual detectability than the fundamental frequency-based transfer of detail.

7. Mathematical codes used to generate the digital image are called:

- A. Binary Codes
- B. Algorithms**
- C. Binary Digits
- D. Bytes

Algorithms are the set of step-by-step instructions that define how raw data are transformed into a visual image. In digital imaging, the image is produced by applying mathematical rules to the data—how signals are sampled, quantized, filtered, reconstructed, and displayed. These procedures govern the overall appearance and quality of the image, from reconstruction methods to tonal mapping and compression. Binary codes, binary digits, and bytes are basic data representations or storage units, not the processing rules that generate the image. Thus, the best answer is algorithms because they describe the procedural, mathematical methods used to create the image from the data.

8. Which grid design provides the best scatter cleanup?

- A. Air Gap Technique
- B. Focused Grids
- C. Crosshatch Grids**
- D. Parallel Grids

Scatter control is all about absorbing photons that have bounced off the patient before they reach the image receptor, so the way a grid is designed determines how effectively it stops that off-angle radiation. A crosshatched grid has two sets of lead strips oriented at right angles to each other, so scattered photons traveling in multiple directions are intercepted by at least one of the strip directions. That two-direction absorption makes this design the most effective at cleaning up scatter and improving image contrast compared with grids that rely on a single direction of absorption. Air gap techniques reduce scatter by letting more distance separate the patient from the detector, but at the cost of sharpness and consistency; it's not as reliable for scatter cleanup as using a grid. Focused grids are designed to match beam divergence in one direction, which helps with grid alignment and cutoff in that specific geometry but doesn't offer the omnidirectional scattering interception of a crosshatched grid. Parallel grids provide uniform absorption in a single direction but are less effective at removing scatter coming from other angles, making them the least effective of the options for scatter cleanup.

9. What does the Modulation Transfer Function (MTF) describe in radiographic systems?

- A. MTF describes the detector's dynamic range.
- B. MTF describes the system's ability to reproduce contrast at different spatial frequencies, reflecting sharpness.**
- C. MTF measures exposure latitude.
- D. MTF indicates the color depth of the digital image.

The main idea is that the Modulation Transfer Function describes how well a radiographic system preserves image contrast as details get finer, i.e., across different spatial frequencies. Spatial frequency corresponds to how small or fine the structures are in the image; low frequencies are large, broad features, while high frequencies are fine details. A system with a high MTF maintains more of the object's contrast at higher frequencies, resulting in a sharper, crisper image. The MTF is represented as a curve of how much contrast is transferred at each spatial frequency; values near 1 mean good preservation, while values that drop off indicate blur and loss of detail. This concept is distinct from dynamic range (how much exposure the detector can handle), exposure latitude (the range of exposures that produce acceptable images), or color depth (color information), which is why the described choice is the best fit.

10. Which term describes a high-contrast image with limited gray tones?

- A. Long-scale contrast
- B. Short-scale contrast**
- C. Equal grayscale
- D. Moderate contrast

Understanding how contrast scales relate to the range of gray tones helps explain why a high-contrast image with only a few gray values is described as short-scale contrast. When an image uses a small number of gray levels, bright areas push toward white and dark areas push toward black, with limited midtones. This creates a crisp, abrupt difference between light and dark areas — the hallmark of short-scale contrast. In contrast, long-scale (wide dynamic range) involves many gray levels and smoother transitions, so you see more gradation in midtones. An image with equal grayscale would lack contrast altogether, appearing as a uniform tone. Moderate contrast sits between these extremes, offering more tonal steps than short-scale but fewer than long-scale.

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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:

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

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