Mosby Digital Image Acquisition Practice Test (Sample)

Study Guide

BY EXAMZIFY

Everything you need from our exam experts!

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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

1. An artificial increase in display contrast at an edge of the image is called which?

A. Smoothing

B. Edge enhancement

C. Contrast resolution

D. Spatial resolution

2. What is the software function that evens the brightness displayed in the image called?

A. Smoothing

B. Equalization

C. Postprocessing

D. Subtraction

3. Which grid type provides the most effective scatter cleanup?

A. Air Gap Technique

B. Focused Grids

C. Crosshatch Grids

D. Parallel Grids

4. The range of source-to-image distances (SIDs) that may be used with a focused grid is called what?

A. Grid Ratio

B. Objective Plane

C. Anticutoff Distances

D. Focal Distance (Grid Radius)

5. In CR imaging, what term describes the plate that stores the latent image?

A. ABC

B. PSP

C. DQE

D. SNR

6. When using beam restriction, what adjustment is typically required for technical factors?

A. Increase kVp

B. Decrease kVp to reduce the number of Compton interactions taking place

C. Decrease mAs to reduce the number of Compton interactions taking place

D. Increase mAs to compensate for the number of rays removed from the primary beam

7. An indicator of the dose level needed to acquire an optimal image is which metric?

A. Detective Quantum Efficiency

B. Dose Area Product

C. Field of View

D. Dynamic Range

8. Digital image receptors are more sensitive to which factor?

A. Scatter and background radiation

B. Fluorescent lights

C. Free electrons

D. Free radicals

9. In radiography, high kVp is associated with which statement about grayscale?

A. Many gray tones

B. Few gray tones

C. No gray tones

D. All black and white only

10. Low-kVp technique is most associated with which type of contrast scale?

A. High-contrast

B. Low-contrast

C. Long-scale contrast

D. Short-scale contrast

Answers

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

Explanations

1. An artificial increase in display contrast at an edge of the image is called which?

A. Smoothing

B. Edge enhancement

C. Contrast resolution

D. Spatial resolution

Edge enhancement is the process of increasing contrast at boundaries between structures to make edges appear more distinct. This often involves boosting the high-frequency components of the image so the brightness changes more sharply where two regions meet. When you look at an image with edge enhancement, you'll notice crisper outlines and more defined borders between bright and dark areas. Smoothing, by contrast, would soften or blur edges, reducing sharp transitions. Contrast resolution describes the overall ability to distinguish different brightness levels across the image, not specifically at edges. Spatial resolution refers to how finely detail is laid out or how close two structures can be before they blur together, which is about spatial detail rather than local edge contrast.

2. What is the software function that evens the brightness displayed in the image called?

A. Smoothing

B. Equalization

C. Postprocessing

D. Subtraction

Equalization, specifically histogram equalization, is the function that evens the brightness across an image. It works by analyzing the distribution of pixel intensities and redistributing them so the full range of brightness values is used. This makes dark areas brighter and very bright areas less extreme, resulting in a more uniform brightness and better overall contrast. Smoothing reduces noise or blurs details and doesn't aim to balance brightness across the whole image. Postprocessing is a general term for processing after acquisition, not a specific brightness-balancing operation. Subtraction removes one image from another, which is unrelated to leveling brightness.

3. Which grid type provides the most effective scatter cleanup?

A. Air Gap Technique

B. Focused Grids

C. Crosshatch Grids

D. Parallel Grids

Scatter cleanup relies on how well the grid can absorb photons that are not traveling in the primary beam. Crosshatched grids use two linear grid grids placed at right angles, so lead strips block scatter coming from multiple directions as it exits the patient. That two-directional absorption means a much larger portion of scattered photons are removed before reaching the image receptor, which preserves image contrast more effectively than grids with a single orientation. Air-gap technique reduces scatter by increasing the distance between patient and detector, but it's not a grid and doesn't provide the same robust, directional suppression of scatter as a high-ratio, two-direction grid. Parallel grids offer good alignment simplicity but only block scatter well in one direction, and focused grids are designed to conform to beam divergence at a specific distance, improving primary transmission but still not matching the two-direction scatter rejection of crosshatched grids.

4. The range of source-to-image distances (SIDs) that may be used with a focused grid is called what?

A. Grid Ratio

B. Objective Plane

C. Anticutoff Distances

D. Focal Distance (Grid Radius)

Focused grids are designed around a specific focal distance, also called the grid radius, which defines the SID range where the grid works best. This focal distance is the distance from the grid to the x-ray source at which the grid lines are intended to converge to match the divergent beam. When the SID is within this focal range, the primary photons pass through the grid with minimal attenuation and grid cutoff is minimized, giving good image quality. If the SID falls outside this range, the geometry misaligns with the grid lines, causing grid cutoff and loss of exposure at the edges. So, the range of SIDs usable with a focused grid is the focal distance (grid radius). The other terms describe different grid properties (grid ratio is about strip height to interspace width; objective plane and anticutoff distances relate to other aspects of grid behavior) and do not define the SID range for focused grids.

5. In CR imaging, what term describes the plate that stores the latent image?

A. ABC

B. PSP

C. DQE

D. SNR

In computed radiography, the plate that stores the latent image is the photostimulable phosphor plate. This imaging plate is coated with phosphor crystals that trap electrons after X-ray exposure, preserving the captured image as a latent signal. When the plate is later read, a laser scans its surface and stimulates the trapped electrons to release their energy as light, creating a visible signal that's converted into a digital image. The term PSP specifically names this plate, distinguishing it from performance metrics like DQE (detective quantum efficiency) or SNR (signal-to-noise ratio), which describe image quality rather than the physical plate.

6. When using beam restriction, what adjustment is typically required for technical factors?

A. Increase kVp

B. Decrease kVp to reduce the number of Compton interactions taking place

C. Decrease mAs to reduce the number of Compton interactions taking place

D. Increase mAs to compensate for the number of rays removed from the primary beam

Beam restriction narrows the primary beam, so fewer photons reach the detector. To keep the same exposure and image quality after limiting the field, you typically raise the exposure by increasing mA-seconds. The energy level (kVp) is usually kept the same or adjusted based on image quality goals, not to compensate for the smaller field. Decreasing mAs would reduce exposure further, and changing kVp or using it to counteract the field reduction would alter image contrast and penetration rather than properly compensate for the fewer photons reaching the receptor. Compton interactions aren't the primary factor addressed by beam restriction; the practical adjustment is to increase mAs to maintain receptor exposure.

7. An indicator of the dose level needed to acquire an optimal image is which metric?

A. Detective Quantum Efficiency

B. Dose Area Product

C. Field of View

D. Dynamic Range

The metric that indicates the dose level needed to acquire an optimal image is Dose Area Product. This metric combines how much radiation dose is delivered with the size of the area exposed, giving a single value that reflects the total energy deposited in the patient during the exposure. Because it accounts for both dose and field size, it correlates with the potential image quality you can achieve and with the overall patient dose, helping you gauge whether you've reached sufficient exposure without unnecessary increases in dose. Detector efficiency (how well the system converts x-rays into an image) is described by Detective Quantum Efficiency, while Field of View refers to how much anatomy is captured, and Dynamic Range describes the detector's ability to handle a range of signal levels. These relate to image quality and system performance in different ways but not to the overall dose delivered for an optimal image like Dose Area Product does.

8. Digital image receptors are more sensitive to which factor?

A. Scatter and background radiation

B. Fluorescent lights

C. Free electrons

D. Free radicals

Digital image receptors respond to the photons that reach them, and their image quality is especially affected by extraneous exposure. Scatter and background radiation add unwanted photons to the detector, creating a hazy background and reducing image contrast. This extra, non-image signal lowers the signal-to-noise ratio, making details harder to see even though the detector can handle a wide range of exposures. Fluorescent lights aren't part of the x-ray exposure reaching the detector, so they don't influence the captured image. Free electrons and free radicals aren't the factors that determine the receptor's sensitivity in this context; they're related to other aspects of radiation interactions, not the primary image formation on digital receptors.

9. In radiography, high kVp is associated with which statement about grayscale?

A. Many gray tones

B. Few gray tones

C. No gray tones

D. All black and white only

High kVp increases the energy of the X-ray beam, making it more penetrating. This reduces the differences in attenuation between different tissues, so the transmitted beam levels through anatomy vary more gradually. The result is a wider range of grayscale values on the image, meaning you see many intermediate shades rather than a stark black-and-white look. In practical terms, high kVp lowers subject contrast and expands the grayscale, whereas low kVp would produce high contrast with fewer gray tones. So the statement that best fits is that there are many gray tones.

10. Low-kVp technique is most associated with which type of contrast scale?

A. High-contrast

B. Low-contrast

C. Long-scale contrast

D. Short-scale contrast

Low-kVp imaging enhances image contrast because at lower energies the photoelectric interaction dominates, and this interaction is highly dependent on tissue density and atomic number. This makes attenuation differences between structures like bone and soft tissue much more pronounced, so more photons are absorbed in some areas and more pass through others, resulting in a stark black-and-white image. That's high-contrast (short-scale) imaging. In contrast, higher kVp reduces subject contrast by increasing scatter and making tissue attenuations more similar, which produces many gray tones (long-scale, low-contrast).

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://mosbydigiimageacquisition.examzify.com

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