

ARRT COMPUTED TOMOGRAPHY (CT) REGISTRY PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. MDCT uses what shape of beam during imaging?**
 - A. Square beam
 - B. Cone-shaped beam
 - C. Rectangular beam
 - D. Pyramid beam
- 2. What is the term for the combined thickness of all sections acquired simultaneously in MSCT?**
 - A. Step artifact
 - B. Total collimation
 - C. Systole
 - D. Stranding
- 3. What type of filter is used in CT to compensate for a cylindrical shape of the body?**
 - A. Bow-tie filter
 - B. Circular filter
 - C. Cone filter
 - D. Layered filter
- 4. What timeframe is associated with peak atrial enhancement for hepatic contrast?**
 - A. 15-25 seconds
 - B. 25-35 seconds
 - C. 35-45 seconds
 - D. 45-55 seconds
- 5. What does increasing slice thickness do to the image quality?**
 - A. Increases spatial resolution
 - B. Decreases partial volume effects
 - C. Can enhance image noise
 - D. Reducing overall exposure time

- 6. What is used to describe the rate that a quantity of radiation passes through a unit area over unit time?**
- A. Photon Fluence
 - B. Radiation Density
 - C. Photon Flux
 - D. Radiant Exposure
- 7. Which type of gating allows for heart-rate variability compensation during imaging?**
- A. Prospective ECG Gating
 - B. Retrospective ECG Gating
 - C. Continuous ECG Monitoring
 - D. Single-Phase Gating
- 8. What is the purpose of overbeaming in CT imaging?**
- A. To enhance image contrast
 - B. To avoid penumbral effects at the outer edges
 - C. To reduce patient radiation dose
 - D. To increase spatial resolution
- 9. What are the symptoms associated with mild contrast allergic reactions?**
- A. Mild urticaria, nasal stuffiness, scratchy throat
 - B. Moderate urticaria, throat tightening, wheezing
 - C. Severe urticaria, facial edema, profound hypotension
 - D. Mild edema, facial swelling, severe erythema
- 10. What factor controls Pixel Dimension?**
- A. Slice Thickness
 - B. Image Noise
 - C. Matrix Size
 - D. DFOV

Answers

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

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Explanations

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1. MDCT uses what shape of beam during imaging?

- A. Square beam
- B. Cone-shaped beam**
- C. Rectangular beam
- D. Pyramid beam

MDCT, or Multidetector Computed Tomography, utilizes a cone-shaped beam during imaging. This design is critical for capturing multiple slices of data simultaneously, enhancing the efficiency and speed of the imaging process. The cone-shaped beam allows for improved coverage of the anatomy being scanned, effectively collecting more data in a shorter period compared to other beam shapes. This is especially beneficial for obtaining high-quality images of larger body areas and is integral to the multi-slice technology that characterizes MDCT. The geometry of the cone-shaped beam maximizes the area being imaged while reducing potential artifacts, ultimately contributing to better image quality and diagnosis.

2. What is the term for the combined thickness of all sections acquired simultaneously in MSCT?

- A. Step artifact
- B. Total collimation**
- C. Systole
- D. Stranding

The correct terminology for the combined thickness of all sections acquired simultaneously in multi-slice computed tomography (MSCT) is referred to as "total collimation." In MSCT, multiple detector rows allow for the simultaneous acquisition of several slices of data. The total collimation is essentially the effective width that these multiple detector elements cover during the scan. It determines how thin or thick the slices produced will be, directly influencing spatial resolution and image quality. By controlling the total collimation, technologists can optimize the balance between image detail and radiation dose. This is particularly important in complex imaging scenarios where a detailed view of the anatomy is necessary, such as in oncology or vascular imaging. The total collimation plays a critical role in how the imaging system captures and reconstructs data, ensuring that high-quality images are produced for accurate diagnostics.

3. What type of filter is used in CT to compensate for a cylindrical shape of the body?

- A. Bow-tie filter**
- B. Circular filter
- C. Cone filter
- D. Layered filter

The bow-tie filter is specifically designed to compensate for the cylindrical shape of the human body in computed tomography scans. This type of filter is shaped like a bow-tie, which helps to reduce the radiation dose to areas that are closer to the center of the cylindrical scanning field, such as the abdomen or thorax, while allowing more radiation to reach the peripheries, like the limbs. This ensures a more uniform dose distribution and improves image quality by minimizing the problems associated with variations in tissue density. By shaping the filter in this manner, it also helps to correct for beam hardening effects that can occur due to the differing densities of tissues, leading to enhanced contrast and clearer images. The design is essential for optimizing the balance between image quality and patient safety during CT examinations.

4. What timeframe is associated with peak atrial enhancement for hepatic contrast?

- A. 15-25 seconds
- B. 25-35 seconds**
- C. 35-45 seconds
- D. 45-55 seconds

The timeframe of 25-35 seconds is associated with peak atrial enhancement for hepatic contrast due to the dynamics of blood flow and contrast agent behavior within the body. When a contrast agent is injected for imaging, it takes a certain amount of time for it to circulate through the bloodstream and reach various organs. The time specified here corresponds to the moments after the initial injection when the contrast is optimally concentrated in the hepatic veins and the right atrium of the heart. This peak enhancement is crucial for accurate imaging of the liver, facilitating the differentiation of normal and abnormal structures by maximizing the visual contrast between the vascular structures and surrounding tissues. Understanding the timing of contrast enhancement is important in CT imaging because it influences when scans should be taken to obtain the clearest and most informative images. In this specific window, the contrast agent effectively outlines the hepatic vasculature, allowing for detailed assessment during examinations such as hepatic lesions or other liver pathologies.

5. What does increasing slice thickness do to the image quality?

- A. Increases spatial resolution
- B. Decreases partial volume effects
- C. Can enhance image noise**
- D. Reducing overall exposure time

Increasing slice thickness in computed tomography affects the overall image quality by introducing changes to the clarity and sharpness of the structures being imaged. Thicker slices tend to average out information from a broader range of tissues, which can lead to a more homogenous appearance and a reduction in the detail visible in the image. This averaging effect can enhance image noise because the increased thickness includes contributions from multiple adjacent voxels, potentially blending structures that should be distinct from one another. As a result, while the general signal-to-noise ratio may improve due to a larger volume of tissue being sampled, the actual perceived noise in the image can become more variable, leading to less clear delineation of anatomical details. Thicker slices can also mask small lesions or fine structures that would be more readily apparent in thinner slices, thereby impacting diagnostic capability. In contrast, increasing slice thickness does not increase spatial resolution, as resolution is primarily influenced by pixel size and reconstruction algorithms, nor does it decrease partial volume effects, which tend to become more pronounced with thicker slices. Making slices thicker may not inherently affect exposure time directly, as that depends on other factors such as scan timing and parameters set by the technologist.

6. What is used to describe the rate that a quantity of radiation passes through a unit area over unit time?

- A. Photon Fluence
- B. Radiation Density
- C. Photon Flux**
- D. Radiant Exposure

The term that describes the rate at which a quantity of radiation passes through a unit area over unit time is known as photon flux. Photon flux is calculated as the number of photons (or particles) that pass through a given area in a specific amount of time, making it a measurement of how intensely radiation is being delivered to a certain area over time. This concept is crucial in fields like radiology and radiation therapy, where understanding the delivery of radiation is vital for ensuring effective imaging and treatment while minimizing exposure to surrounding tissues. Photon fluence refers to the total number of photons passing through a unit area, but it does not incorporate the time factor, which is essential in defining flux. Radiation density typically relates to the concentration of radiation in a given volume but does not provide a temporal aspect. Radiant exposure measures the energy delivered by radiation to a specific area over time but focuses more on energy rather than the photon count itself. Hence, photon flux is the most accurate term to describe the rate of radiation passing through an area over time.

7. Which type of gating allows for heart-rate variability compensation during imaging?

- A. Prospective ECG Gating
- B. Retrospective ECG Gating**
- C. Continuous ECG Monitoring
- D. Single-Phase Gating

Retrospective ECG Gating is indeed the correct choice when discussing heart-rate variability compensation during imaging. This technique is significant because it allows for data to be collected continuously throughout the cardiac cycle, regardless of variations in heart rate. The scanner can then sort the acquired data post-examination in relation to specific phases of the heartbeat. This capability to analyze and select the most appropriate slices or data frames correlates directly with various heartbeats enables clinicians to capture a more accurate representation of cardiac anatomy and function, especially in patients whose heart rates fluctuate during the scan. In contrast, Prospective ECG Gating is more selective, triggering the scanning process at predetermined time intervals based on the ECG signal, which can pose challenges if the patient's heart rate changes. Continuous ECG Monitoring refers to keeping an ongoing check of the heart's electrical activity without directly correlating it with the imaging sequence, making it less suitable for addressing heart-rate variability in the context of imaging. Single-Phase Gating analyzes the heart in strictly one phase of the cardiac cycle, lacking the adaptability needed to accommodate fluctuations in heart rate.

8. What is the purpose of overbeaming in CT imaging?

- A. To enhance image contrast
- B. To avoid penumbral effects at the outer edges**
- C. To reduce patient radiation dose
- D. To increase spatial resolution

Overbeaming in CT imaging refers to the deliberate overexposure of the detector array by the x-ray beam beyond the dimensions of the region of interest. The primary purpose of this technique is to minimize penumbral effects at the outer edges of the imaged area. When the x-ray beam is expanded, it helps to ensure that the entire field of view is adequately illuminated, reducing the gradients in intensity that can occur at the edges of the imaging area. This uniformity at the edges enhances the overall quality of the image by preventing dark or blurry edges, which can significantly affect diagnostic accuracy. The other aspects mentioned, such as enhancing image contrast or increasing spatial resolution, are not directly influenced by the concept of overbeaming. Additionally, while reducing patient radiation dose is a critical consideration in CT imaging, overbeaming is more about image quality and edge defining than about radiation dose management. Thus, the main focus of overbeaming is on improving the clarity of images at their peripheries, making it essential for high-quality diagnostic outputs.

9. What are the symptoms associated with mild contrast allergic reactions?

- A. Mild urticaria, nasal stuffiness, scratchy throat**
- B. Moderate urticaria, throat tightening, wheezing
- C. Severe urticaria, facial edema, profound hypotension
- D. Mild edema, facial swelling, severe erythema

Mild contrast allergic reactions typically present with symptoms that are relatively minor and manageable. Among these, urticaria (hives), nasal stuffiness, and a scratchy throat are common manifestations. Urticaria refers to the appearance of raised, itchy welts on the skin, which is a hallmark of mild allergic reactions. Nasal stuffiness can occur due to mild inflammatory responses, affecting the mucous membranes. A scratchy throat can also be indicative of an allergic reaction, resulting from mild irritation in the upper respiratory tract. In contrast, the other options describe symptoms associated with more severe allergic reactions. Moderate urticaria, throat tightening, and wheezing indicate a more pronounced allergic response, potentially leading to significant respiratory distress. Severe symptoms such as severe urticaria, facial edema, and profound hypotension signal anaphylaxis, which is a life-threatening condition requiring immediate medical attention. Lastly, mild edema, facial swelling, and severe erythema point toward more pronounced symptoms that typically align with moderate to severe allergic responses. Understanding the distinction between mild and severe reactions is crucial in clinical settings, as it guides the appropriate management and intervention strategies for patients experiencing contrast allergies.

10. What factor controls Pixel Dimension?

- A. Slice Thickness
- B. Image Noise
- C. Matrix Size**
- D. DFOV

Pixel dimension is determined by the matrix size and the field of view (DFOV). The matrix size refers to the number of pixels in the image, which is expressed as a combination of rows and columns. For instance, a larger matrix size means more pixels, which directly affects the pixel dimensions. Smaller pixel dimensions yield greater detail and resolution in the image. While slice thickness, image noise, and DFOV may influence other aspects of image quality and presentation, they do not directly dictate the pixel dimension itself. Slice thickness relates to the measurement of the volume of tissue being imaged, image noise refers to the graininess or randomness in the image that can mask important structures, and DFOV influences the area of the patient that is imaged and can impact how the pixel dimension is perceived, but the fundamental control of pixel dimension lies in the matrix size. Thus, the selection of matrix size directly influences the final image's pixel dimension, making it the correct factor.

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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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