HESI RADIOLOGIC TECHNOLOGIST PRACTICE EXAM (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.

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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!

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Questions

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1. Out of the people listed below, who is the best person to assist with holding a child during an x-ray exam?

A. the father

B. the mother

C. a nurse

D. a sibling

2. Compute grid ratio: a grid with height 8 mm and interspace 0.8 mm

A. 6:1

B. 10:1

C. 8:1

D. 12:1

3. Which factor most directly contributes to geometric unsharpness in radiography?

A. Focal spot size

B. Exposure time

C. Grid frequency

D. Film speed

4. An image of the wrist is made using 400 mA, 25 ms, 70 kV, a focal spot of 0.4 mm, minimum OID, in a 30 inch SID. Which of the following changes will result in the largest increase in magnification?

A. increase the OID to 3 inches

B. increase the SID

C. increase mA

D. increase kVp

5. The best way to minimize magnification is to use a _____.

A. a long SID

B. both A and B

C. a large OID

D. a short SID

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6. The quantity of bremsstrahlung radiation increases proportionately with increased _____ .

A. Filtration

B. mAs

C. kVp

D. SID

7. Which type of radiation is the dominant output from the X-ray tube in diagnostic imaging?

A. Characteristic radiation

B. Compton scattering

C. Bremsstrahlung

D. Auger electrons

8. How many pixels are present on a 5 megapixel display?

A. 3,000,000

B. 10,000,000

C. 5,000,000

D. 1,500,000

9. In the wrist radiograph example, the focal spot size was

A. 0.3 mm

B. 0.4 mm

C. 0.5 mm

D. 0.6 mm

10. On what date was the x-ray discovered?

A. November 8th, 1895

B. November 8, 1896

C. December 28th, 1895

D. October 2nd, 1895

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Answers

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

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Explanations

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1. Out of the people listed below, who is the best person to assist with holding a child during an x-ray exam?

A. the father

B. the mother

C. a nurse

D. a sibling

The main idea is that a trusted caregiver helps a child stay still and feel safe during the exam, which improves image quality and reduces the need for repeated exposures. A parent who the child knows and trusts is typically the best choice to provide comfort and gentle restraint without increasing anxiety. Among the options, the father is the best fit because he is a parent and can offer reassuring, familiar support that helps the child stay calm and still. A nurse, while skilled, is a medical professional and may not provide the same level of comforting presence for immobilization. A sibling might be anxious or excited and could unintentionally move the child. While a mother is also a guardian and could perform this role well, the scenario presented selects the father as the most suitable helper in this context. In practice, always follow safety protocols: use the parent or guardian if allowed, keep shielding to minimize exposure, and employ immobilization devices or fast technique to reduce motion and radiation dose.

2. Compute grid ratio: a grid with height 8 mm and interspace 0.8 mm

A. 6:1

B. 10:1

C. 8:1

D. 12:1

Grid ratio is determined by comparing the height of the lead strips to the width of the interspace between them. It's calculated as height divided by interspace. Here, the strips are 8 mm tall and the interspace is 0.8 mm, so 8 ÷ 0.8 = 10. The grid ratio is 10:1. A higher grid ratio means more of the primary beam is absorbed by the grid, which improves scatter removal and image contrast, but it also usually requires increasing exposure to maintain the same image density. This pair of dimensions corresponds to a 10:1 grid, a common high-contrast option. If you check the other possibilities, they would require different interspace widths for an 8 mm strip height (for example, 6:1 would need about 1.33 mm interspace, 8:1 about 1.0 mm, 12:1 about 0.67 mm), which isn't what's given here.

3. Which factor most directly contributes to geometric unsharpness in radiography?

A. Focal spot size

B. Exposure time

C. Grid frequency

D. Film speed

Geometric unsharpness comes from the focal spot not being a true point. Because the X-ray source has a finite size, rays originate from different parts of the focal spot and project to slightly different positions on the image receptor. That creates a blurred boundary around structures, called penumbra, so sharp edges become smeared. The size of this blur increases as the focal spot gets bigger, so a larger focal spot produces more geometric unsharpness and lower spatial resolution. Other factors in the list affect different aspects of image quality: exposure time mainly governs motion blur from patient movement, grid frequency mostly influences scatter and contrast, and film speed affects exposure sensitivity, not the sharpness of edges. To reduce geometric unsharpness, use a smaller focal spot and optimize geometry (larger SID, smaller OID).

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4. An image of the wrist is made using 400 mA, 25 ms, 70 kV, a focal spot of 0.4 mm, minimum OID, in a 30 inch SID. Which of the following changes will result in the largest increase in magnification?

A. increase the OID to 3 inches

B. increase the SID

C. increase mA

D. increase kVp

Magnification in radiography comes from geometry: how far the object is from the image receptor (OID) and how far the x-ray tube is from the object (SID). The magnification factor can be described as M = SID / (SID − OID). If you increase OID while keeping SID the same, the denominator (SID − OID) gets smaller, so M increases and the image appears larger. If you increase SID with OID fixed, the ratio tends toward 1, so magnification decreases. The exposure factors (mA, kVp) and focal spot size mainly affect exposure and sharpness, not the size of the image. In this scenario, increasing the OID to 3 inches directly increases magnification, while increasing SID would reduce magnification. Therefore, the change that yields the largest magnification is increasing the OID.

5. The best way to minimize magnification is to use a _____.

A. a long SID

B. both A and B

C. a large OID

D. a short SID

Magnification is all about distances: the source, the patient (object), and the image receptor. The larger the distance from the source to the receptor (SID), the less the beam diverges before it hits the receptor, so the image appears closer to true size. The distance from the object to the receptor (OID) also matters—the bigger that gap, the larger the image on the receptor. The magnification factor is essentially SID divided by SOD (source-to-object distance). If you increase SID, SOD increases too, making the ratio closer to 1, which means less magnification. If you increase OID, SOD decreases relative to SID, increasing magnification. So to minimize magnification, you want a long SID and a small OID. Among the options, using a long SID aligns with reducing magnification; a large OID would increase magnification, and a short SID would also increase magnification. The best practical approach to minimize magnification is to use a long SID and keep the OID as small as possible.

6. The quantity of bremsstrahlung radiation increases proportionately with increased _____ .

A. Filtration

B. mAs

C. kVp

D. SID

The amount of bremsstrahlung produced in the tube (the beam's quantity) depends on how many electrons strike the target each second. That is controlled by the tube current and exposure time, collectively known as mAs. Increasing mAs means more electrons reach the target per unit time, more interactions occur, and more photons are produced. Filtration and SID affect the beam after it's produced (filtration absorbs some photons; SID changes the dose at the image receptor via distance), while kVp changes the energy of the photons (beam quality) rather than how many are produced. So the quantity increases with higher mAs.

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7. Which type of radiation is the dominant output from the X-ray tube in diagnostic imaging?

A. Characteristic radiation

B. Compton scattering

C. Bremsstrahlung

D. Auger electrons

In the X-ray tube, electrons are accelerated toward the heavy target (like tungsten) and are rapidly decelerated as they pass near the nuclei. This braking interaction produces photons across a continuous spectrum, known as Bremsstrahlung (braking radiation). It is the dominant form of X-ray production because it occurs with essentially every high-energy electron–nucleus encounter and yields a large number of photons over a range of energies up to the tube's maximum kVp. Characteristic radiation does occur when inner-shell electrons are ejected and outer shells fill the vacancies, giving photons with specific energies, but this process has lower probability and contributes less to the overall output than Bremsstrahlung. Auger electrons arise from inner-shell relaxation after ionization and are not the primary photons produced. Compton scattering describes photon interactions in matter after emission, not the primary generation mechanism inside the tube.

8. How many pixels are present on a 5 megapixel display?

A. 3,000,000

B. 10,000,000

C. 5,000,000

D. 1,500,000

Megapixel means one million pixels. So a five-megapixel display has five million total pixels. The term refers to the total pixel count, not per color channel. Five million equals 5,000,000, which matches the option.

9. In the wrist radiograph example, the focal spot size was

A. 0.3 mm

B. 0.4 mm

C. 0.5 mm

D. 0.6 mm

Focal spot size determines how much geometric blur appears in the image. A smaller focal spot reduces that blur, so tiny structures—like the carpal bones and joint spaces in the wrist—come out with crisper detail. That's why wrist and other small extremity radiographs are often taken with a small focal spot to maximize sharpness. In the wrist radiograph example, the focal spot size used was 0.4 mm. This size provides good resolution for fine wrist details while keeping the tube's heat load within safe limits. A larger focal spot would blur small structures and reduce detail, whereas an even smaller spot could marginally improve sharpness but at the cost of higher heat and possible technique limitations.

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10. On what date was the x-ray discovered?

A. November 8th, 1895

B. November 8, 1896

C. December 28th, 1895

D. October 2nd, 1895

Röntgen's breakthrough occurred while he was experimenting with cathode-ray tubes and noticing a new kind of penetrating radiation that could pass through tissues and expose photographic plates. He named these rays X-rays and announced the discovery to the world on November 8, 1895, marking the date scientists refer to as the discovery of X-rays. This moment is the turning point that started radiology as a field. The famous first radiograph of a living person—the hand with its wedding ring—came a few weeks later, illustrating the practical imaging potential of the new rays. The other dates don't align with the initial discovery event, either occurring before his work or after the public announcement.

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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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