

Nondestructive Testing (NDT) UT Level II Practice Test (Sample)

Study Guide



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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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. When frequency is increased in a material with a given velocity, what happens to the wavelength?**
 - A. Increases**
 - B. Remains constant**
 - C. Decreases**
 - D. Varies unpredictably**

- 2. During testing by the surface wave method, what may patches of oil or dirt on the surface cause?**
 - A. Increase in signal amplitude**
 - B. Complete signal loss**
 - C. Reduced sound transmission**
 - D. Both attenuation of sound and indication on the screen**

- 3. Which term describes the ability of an ultrasonic testing system to differentiate between entry surface response and responses of nearby discontinuities?**
 - A. Resolution**
 - B. Clarity**
 - C. Definition**
 - D. Contrast**

- 4. What is the primary purpose of reference blocks in ultrasonic testing?**
 - A. To aid in obtaining maximum back reflections**
 - B. To obtain the greatest sensitivity possible**
 - C. To obtain a common reproducible signal**
 - D. To provide calibration for different materials**

- 5. When the incident angle is between the first and second critical angles, what ultrasonic wave mode will be observed?**
 - A. Longitudinal wave**
 - B. Shear wave**
 - C. Surface wave**
 - D. Compression wave**

- 6. What is defined as the number of complete waves passing a given point in a second?**
- A. Amplitude**
 - B. Wave velocity**
 - C. Frequency**
 - D. Wavelength**
- 7. In a test where the transducer is angled to the inspection surface, what equals the angle of incidence?**
- A. The angle of reflection**
 - B. The angle of refraction**
 - C. The angle of deviation**
 - D. The angle of diffraction**
- 8. The relationship of variables in ultrasonic testing can be summarized by which acronym?**
- A. FPADSCRAN**
 - B. FADSCPRN**
 - C. FRADSCPNA**
 - D. DCSFAPRA**
- 9. In immersion testing, maximum reflection from the entry surface indicates what?**
- A. Normalization of the search unit**
 - B. Elimination of water multiples**
 - C. Proper wavelength**
 - D. Max amplitude of the initial pulse**
- 10. What does the term "time-of-flight" refer to in ultrasonic testing?**
- A. The duration it takes for sound to travel to a flaw and back**
 - B. The time it takes to prepare the testing surface**
 - C. The speed at which the ultrasonic equipment operates**
 - D. The time delay between sending and receiving ultrasonic pulses**

Answers

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

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Explanations

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1. When frequency is increased in a material with a given velocity, what happens to the wavelength?

- A. Increases**
- B. Remains constant**
- C. Decreases**
- D. Varies unpredictably**

When the frequency of a wave is increased while the velocity of the wave in the material remains constant, the wavelength must decrease. This relationship is described by the fundamental wave equation: $\text{Wavelength } (\lambda) = \text{Velocity } (v) / \text{Frequency } (f)$. In this equation, if the velocity (v) does not change and the frequency (f) increases, the resulting wavelength (λ) must decrease to maintain the equality. This behavior underpins many applications in nondestructive testing (NDT) and ultrasonics, where adjustments to the frequency of the ultrasonic waves directly influence the wavelength, impacting resolution and penetration capabilities in material assessment. Therefore, when frequency increases in a material with constant velocity, the wavelength accordingly decreases, leading to the correct answer.

2. During testing by the surface wave method, what may patches of oil or dirt on the surface cause?

- A. Increase in signal amplitude**
- B. Complete signal loss**
- C. Reduced sound transmission**
- D. Both attenuation of sound and indication on the screen**

The surface wave method relies on effective sound transmission through the coupling medium, which is often the surface of the material being tested. When there are patches of oil or dirt on the surface, they interfere with this necessary coupling. Such contaminants can lead to two primary issues: attenuation of the sound waves and potential indications on the testing display. Attenuation occurs because oil or dirt can disrupt the mechanical coupling between the transducer and the test material, reducing the amount of sound energy that successfully travels into the material. This results in lower amplitude signals and potentially weaker returns. Additionally, depending on the distribution and nature of the contaminants, the display screen may show irregular signals. For example, the presence of patches may cause variability or noise in the signal, creating indications that do not truly represent the material's internal condition. Thus, the combination of these effects—sound attenuation and altered indications on the display—supports the correctness of the answer that identifies both attenuation of sound and its impact on the screen during testing.

3. Which term describes the ability of an ultrasonic testing system to differentiate between entry surface response and responses of nearby discontinuities?

A. Resolution

B. Clarity

C. Definition

D. Contrast

The term that accurately describes the ability of an ultrasonic testing system to differentiate between the entry surface response and the responses of nearby discontinuities is resolution. Resolution refers to the capacity of a testing system to distinguish between two closely spaced reflectors or features within the material being examined. In ultrasonic testing, high resolution is crucial for identifying and characterizing flaws, allowing the operator to discern the reflections from the entry surface and those from any imperfections within the material. In this context, while clarity, definition, and contrast might seem relevant, they do not specifically capture the technical aspect of distinguishing between signals generated by different sources within the material. Clarity often pertains to the overall visibility of the data on the display, definition might suggest the detail present, and contrast typically relates to the difference in signal amplitudes rather than the spatial differentiation required for resolving closely spaced returns. Thus, resolution is the precise term for this capability in ultrasonic testing.

4. What is the primary purpose of reference blocks in ultrasonic testing?

A. To aid in obtaining maximum back reflections

B. To obtain the greatest sensitivity possible

C. To obtain a common reproducible signal

D. To provide calibration for different materials

The primary purpose of reference blocks in ultrasonic testing is to obtain a common reproducible signal. Reference blocks are typically made from a known material and have specific geometries that allow testers to establish baseline data against which test results can be compared. By utilizing these reference blocks, technicians can ensure that the signals received during tests are consistent and comparable across different inspections and equipment setups. This reproducibility is crucial in maintaining the reliability and accuracy of the ultrasonic testing process, enabling the detection of flaws in a consistent manner. While back reflections, sensitivity, and calibration are all important aspects of ultrasonic testing, the reference block specifically serves as a yardstick for comparison, ensuring that all measurements taken are standardized. This helps in identifying anomalies and verifying the integrity of materials effectively.

5. When the incident angle is between the first and second critical angles, what ultrasonic wave mode will be observed?

- A. Longitudinal wave**
- B. Shear wave**
- C. Surface wave**
- D. Compression wave**

When the incident angle is between the first and second critical angles, the ultrasonic wave mode that is predominantly observed is a shear wave. In ultrasonic testing, critical angles play a significant role in determining the behavior of sound waves at interfaces. The first critical angle marks the transition point where longitudinal waves start to be refracted into the material, while the second critical angle is where shear waves can propagate through the material. When the incident angle is between these two critical angles, the conditions are met for the generation of shear waves. Shear waves are distinguished by their ability to move perpendicular to the direction of wave propagation and are sensitive to flaws such as cracks and lamination in the material. In contrast, longitudinal waves (which account for changes in density and are typically faster) cannot propagate in the region between these angles without significant refraction. Compression waves are essentially the same as longitudinal waves and therefore share similar propagation characteristics, thus not being applicable in this specific angular range. Surface waves, on the other hand, typically travel along the surface of the material and are not part of the interaction in question between these critical angles. This makes the observation of shear waves the correct response when the incident angle lies between the first and second critical angles.

6. What is defined as the number of complete waves passing a given point in a second?

- A. Amplitude**
- B. Wave velocity**
- C. Frequency**
- D. Wavelength**

The definition of the number of complete waves passing a given point in a second is indeed frequency. In wave mechanics, frequency is a fundamental property that quantifies how often a repetitive event occurs within a specific timeframe. It is typically measured in hertz (Hz), where one hertz corresponds to one complete wave cycle passing a point in one second. Understanding frequency is crucial in various applications, including ultrasonic testing, where the frequency of the sound waves can affect the resolution and penetration of the waves into the material being tested. Higher frequencies generally provide better resolution, while lower frequencies can penetrate thicker materials. The other terms relate to various aspects of waves but do not define the rate of wave cycles. Amplitude refers to the height of the wave from its mean position, indicating energy rather than the number of cycles. Wave velocity is the speed at which the wave travels through a medium, while wavelength is the distance between successive peaks of the wave. Each of these characteristics plays a significant role in the overall behavior of waves but does not describe the frequency of wave occurrences.

7. In a test where the transducer is angled to the inspection surface, what equals the angle of incidence?

- A. The angle of reflection**
- B. The angle of refraction**
- C. The angle of deviation**
- D. The angle of diffraction**

In the context of ultrasonic testing, when a transducer is angled relative to the inspection surface, the angle of incidence is defined as the angle at which the ultrasound beam strikes the surface. According to the laws of reflection, the angle of incidence is equal to the angle of reflection. This means that if a transducer sends an ultrasonic wave at a specific angle to an interface, the wave will reflect off that interface at the same angle, maintaining the principle that angles are measured from a straight line perpendicular to the surface (normal line). Understanding this relationship is crucial in NDT because it helps in interpreting the results when analyzing reflected waves, especially when dealing with flaws or interfaces. The angles involved play a significant role in determining how sound waves propagate through materials and how they are reflected, which directly influences the accuracy and reliability of test results. In contrast, the angle of refraction pertains to the bending of the wave as it passes into another medium, which is governed by Snell's Law, while the angle of deviation does not directly relate to reflection or refraction in this context. Angle of diffraction involves the spreading of waves when they encounter an obstacle or slit, which is also not related to incidence or reflection at an interface in standard ultrasonic testing scenarios.

8. The relationship of variables in ultrasonic testing can be summarized by which acronym?

- A. FPADSCRAN**
- B. FADSCPRN**
- C. FRADSCPNA**
- D. DCSFAPRA**

In ultrasonic testing, the acronym that summarizes the relationship of variables is FPADSCRAN. Each letter represents a key component or factor that influences the outcomes of ultrasonic testing. Understanding the components of FPADSCRAN is crucial for technicians as it encapsulates various aspects such as frequency, amplitude, distance, sound speed, and other relevant parameters that need to be considered for effective testing and interpretation of results. Choosing the correct acronym is essential for mastering the principles of ultrasonic testing as it provides a framework for remembering the critical relationships between different variables affecting test results. This foundational knowledge is key when applying ultrasonic testing in practical scenarios, ensuring that technicians can accurately assess materials and detect potential flaws.

9. In immersion testing, maximum reflection from the entry surface indicates what?

- A. Normalization of the search unit**
- B. Elimination of water multiples**
- C. Proper wavelength**
- D. Max amplitude of the initial pulse**

In immersion testing, maximum reflection from the entry surface typically indicates the optimization of the search unit's alignment with the test material. This optimal alignment facilitates the most efficient transmission of ultrasonic waves into the material, resulting in a strong return signal from the entry surface. When the search unit is properly normalized, it means that it has been calibrated to work effectively with the characteristics of the material being tested and the medium, in this case, water. A strong reflection not only confirms that the sound waves are passing into the material but also that there are minimal losses or distortions occurring at the entry interface. In contrast, the other options do not directly relate to the concept of achieving maximum reflection from the entry surface. Eliminating water multiples pertains to mitigating unwanted echoes in the water, while ensuring proper wavelength relates to factors such as frequency and material characteristics, but not directly to surface reflection. The max amplitude of the initial pulse is more about the intensity of the wave being generated rather than the conditions that affect surface reflection in immersion testing.

10. What does the term "time-of-flight" refer to in ultrasonic testing?

- A. The duration it takes for sound to travel to a flaw and back**
- B. The time it takes to prepare the testing surface**
- C. The speed at which the ultrasonic equipment operates**
- D. The time delay between sending and receiving ultrasonic pulses**

The term "time-of-flight" in ultrasonic testing specifically refers to the duration it takes for ultrasonic sound waves to travel from the transducer to a flaw within the material and then return to the transducer. This measurement is crucial because it helps determine the distance to the flaw based on the speed of sound in the material being tested. By analyzing the time taken for this round trip, technicians can calculate the depth of the flaw and assess the integrity of the material. The other options describe unrelated aspects of the ultrasonic testing process or equipment. The preparation of the testing surface, the operational speed of the equipment, and the general concept of time delays do not specifically capture the essence of what "time-of-flight" entails. Understanding the time-of-flight measurement is essential for accurate flaw detection and assessment in ultrasonic testing applications.

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://ndtutlevel2.examzify.com>

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