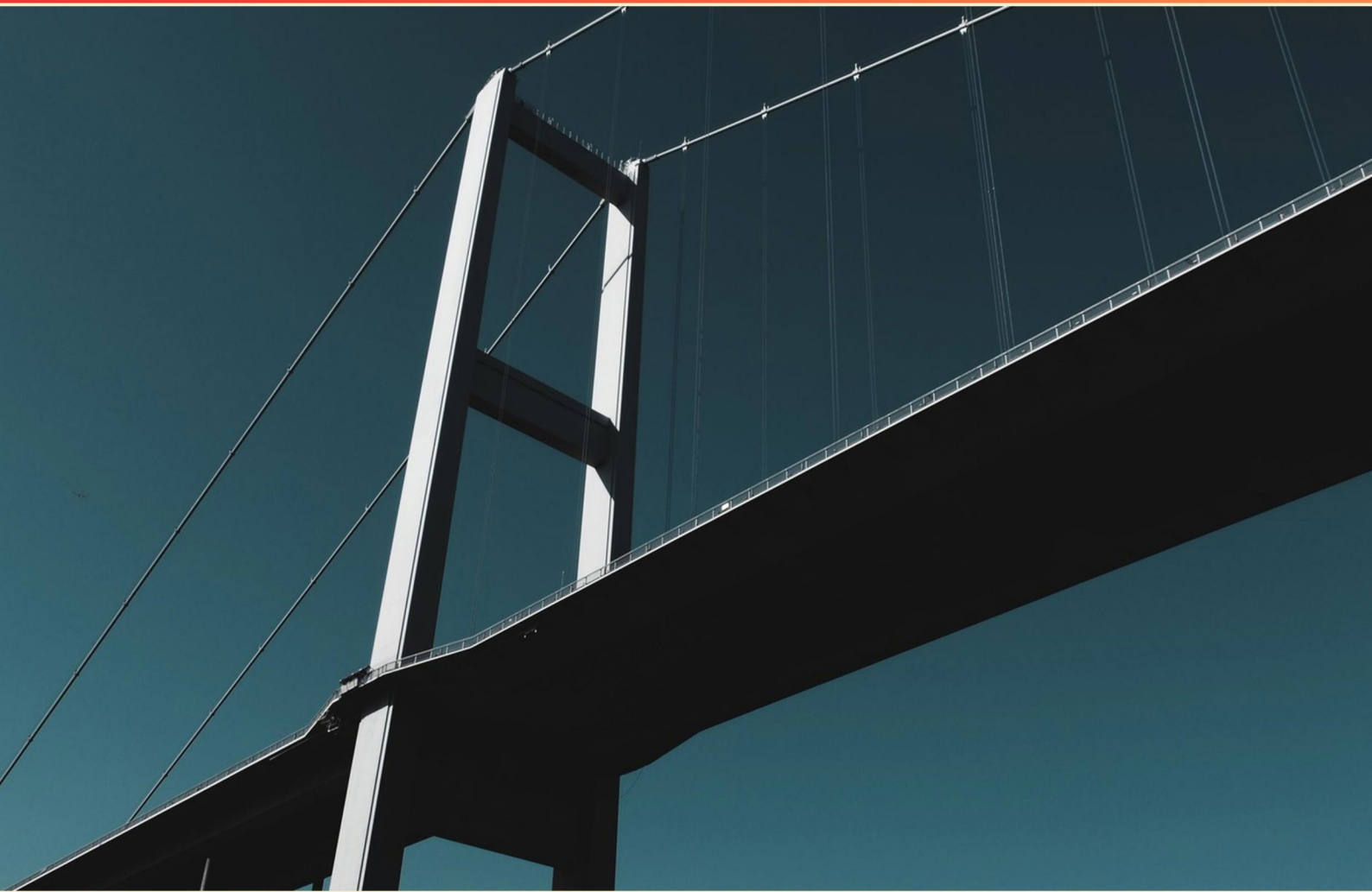


NATIONAL HIGHWAY INSTITUTE (NHI) SAFETY INSPECTION OF IN- SERVICE BRIDGES FINAL ASSESSMENT PRACTICE EXAM (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

**VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE**

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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. What is a common span range for steel frame bridges?**
 - A. Less than 25 feet
 - B. 25 to over 50 feet
 - C. 50 to over 200 feet
 - D. Over 300 feet
- 2. What is one advantage of using drainage troughs in bridge design?**
 - A. They maximize space underneath the bridge
 - B. They can divert excess water runoff
 - C. They are cheap to install
 - D. They enhance the aesthetic appeal of the bridge
- 3. What type of scour is primarily related to sediment transport in conjunction with local scour?**
 - A. Live-bed scour
 - B. Clear-water scour
 - C. General scour
 - D. Contraction scour
- 4. Among the top tests for small surface deficiencies in steel, which one is NOT included?**
 - A. Dye penetrant
 - B. Ultrasonic testing
 - C. Magnetic particle testing
 - D. Eddy current
- 5. What is the function of railing on a bridge?**
 - A. To support the bridge structure
 - B. To contain and redirect errant vehicles
 - C. To guide traffic flow
 - D. To serve as a decorative feature

- 6. Which of the following is NOT typically a sign of settlement?**
- A. Joint openings
 - B. Cracks in concrete
 - C. Plant growth
 - D. Buckling of steel members
- 7. Which test is considered most effective for detecting subsurface deficiencies?**
- A. Dye penetrant testing
 - B. Radiography
 - C. Magnetic particle testing
 - D. Acoustic emission
- 8. What type of bridge superstructure is composed of a reinforced concrete slab?**
- A. Beam bridge
 - B. Arch bridge
 - C. Slab bridge
 - D. Truss bridge
- 9. Which of the following methods is not effective for inspecting large areas of concrete?**
- A. Ground Penetrating Radar
 - B. Impact Echo Test
 - C. Acoustic Wave Testing
 - D. Vibration Testing
- 10. Where can you find the guidelines for railing design and testing?**
- A. ANSI Standards for Safety
 - B. Federal Highway Administration Manual
 - C. AASHTO Guide Specifications for Bridge Railings
 - D. American Concrete Institute Guidelines

Answers

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

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Explanations

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1. What is a common span range for steel frame bridges?

- A. Less than 25 feet
- B. 25 to over 50 feet
- C. 50 to over 200 feet**
- D. Over 300 feet

Steel frame bridges are designed for a significant range of spans, with a common span range being between 50 to over 200 feet. This span range allows for adequate structural support and versatility in various applications, from highways to railways. Bridges in this span category can efficiently handle traffic loads while providing stability and durability. Steel, as a material, is particularly well-suited for longer spans due to its high tensile strength, enabling the structure to carry substantial weight while minimizing material use. This characteristic leads to designs that can accommodate a variety of environmental conditions and loading scenarios, making steel frame bridges popular for medium to long spans. By contrast, shorter spans are typically associated with different types of bridge designs or materials better suited to those needs, and spans significantly longer than 200 feet often require specialized engineering solutions due to increasing complexity in load management, structural behavior, and construction techniques. Therefore, the specified span range for steel frame bridges accurately reflects the capabilities and typical applications of this type of bridge construction.

2. What is one advantage of using drainage troughs in bridge design?

- A. They maximize space underneath the bridge
- B. They can divert excess water runoff**
- C. They are cheap to install
- D. They enhance the aesthetic appeal of the bridge

One significant advantage of using drainage troughs in bridge design is their ability to divert excess water runoff. Proper drainage is crucial in bridge construction as it helps prevent water accumulation, which can lead to structural damage, erosion, and unsafe conditions for vehicles and pedestrians. By channeling the water away effectively, drainage troughs minimize the risk of hydrostatic pressure and potential flooding under the bridge, thereby enhancing the longevity and safety of the structure. This proactive approach in design helps maintain the integrity of the bridge over time and reduces maintenance costs associated with water-related damage.

3. What type of scour is primarily related to sediment transport in conjunction with local scour?

- A. Live-bed scour**
- B. Clear-water scour
- C. General scour
- D. Contraction scour

Live-bed scour is the correct answer because it refers to a condition where the flow of water carries sediment in suspension, resulting in a scouring effect around structural elements such as bridge piers or abutments. In live-bed conditions, sediment transport is actively occurring, which means that the moving water is not only removing material from the bed but also transporting it downstream. This interplay between sediment transport and local scour leads to significant erosion around structures. Understanding the nature of live-bed scour is critical for assessing the vulnerability of bridges to erosion processes, particularly in environments where sediment transport is continuous and dynamic. In contrast, other types of scour, like clear-water scour, occur when no sediment transport is happening; general scour refers to the overall lowering of the riverbed due to changes in flow patterns over a wider area, while contraction scour describes the scour that occurs when the width of the channel decreases, causing an increase in flow velocity. Each of these other types of scour has different implications for bridge safety and design, but live-bed scour uniquely highlights the relationship between sediment transport and local erosive forces around bridge elements.

4. Among the top tests for small surface deficiencies in steel, which one is NOT included?

- A. Dye penetrant
- B. Ultrasonic testing**
- C. Magnetic particle testing
- D. Eddy current

The answer points to ultrasonic testing as not being included among the top tests specifically aimed at small surface deficiencies in steel. This is because ultrasonic testing primarily focuses on detecting internal flaws such as cracks, voids, or inclusions within the material rather than surface-related defects. In contrast, the other methods listed—dye penetrant, magnetic particle testing, and eddy current testing—are indeed effective for identifying surface defects. Dye penetrant testing utilizes a dye that penetrates surface openings to reveal defects when viewed under ultraviolet light. Magnetic particle testing employs magnetic fields to detect surface and near-surface discontinuities in ferromagnetic materials. Eddy current testing uses electromagnetic induction to identify surface defects and changes in material properties. These methods are specifically designed for evaluating small surface imperfections, making ultrasonic testing less applicable in this context.

5. What is the function of railing on a bridge?

- A. To support the bridge structure
- B. To contain and redirect errant vehicles**
- C. To guide traffic flow
- D. To serve as a decorative feature

The function of railing on a bridge primarily involves containing and redirecting errant vehicles. This safety feature is critical in preventing vehicles from leaving the roadway, especially on elevated structures or bridges where falling off could lead to serious accidents. Railings are designed to absorb some of the impact if a vehicle collides with them, effectively acting as a barrier to enhance safety for both vehicle occupants and pedestrians. While railings may have some secondary roles, such as contributing to the aesthetics of the bridge or providing guidance for traffic flow, their primary and most important function is to ensure that vehicles remain on the bridge, thus preventing potential accidents that could occur if vehicles veer off the roadway. This design consideration is essential for maintaining highway safety standards.

6. Which of the following is NOT typically a sign of settlement?

- A. Joint openings
- B. Cracks in concrete
- C. Plant growth**
- D. Buckling of steel members

The correct answer identifies plant growth as not typically being a sign of settlement. Settlement generally refers to the vertical downward movement of a structure due to factors like soil compression, moisture changes, or insufficient foundational support. While various physical indicators can suggest that a structure is experiencing settlement, such as joint openings, cracks in concrete, and buckling of steel members, plant growth does not inherently indicate this issue. In fact, plant growth might occur in areas with sufficient moisture or nutrients, independent of the structural integrity of the nearby elements. Instead, the first three options—joint openings, cracks, and buckling—are direct manifestations of settlement or related structural problems. For example, joint openings can emerge as loads shift and the foundation settles, leading to misalignment. Similarly, cracks in concrete may develop as the materials flex or shift due to unequal settling, while buckling of steel members can occur when underlying support is compromised, causing excessive lateral forces. Hence, plant growth is not a direct sign of settlement, making it the correct choice in this context.

7. Which test is considered most effective for detecting subsurface deficiencies?

- A. Dye penetrant testing
- B. Radiography**
- C. Magnetic particle testing
- D. Acoustic emission

Radiography is considered the most effective test for detecting subsurface deficiencies in materials, particularly in welds and structural components. This method utilizes X-rays or gamma rays to penetrate the material being inspected, allowing for the visualization of internal structures and conditions. When the radiation passes through the material, it is absorbed by denser areas to varying degrees, producing an image that reveals any internal flaws such as cracks, voids, or inclusions that may not be visible on the surface. This capability to provide detailed images of subsurface conditions makes radiography an invaluable tool in bridge safety inspections. In contrast, dye penetrant testing is primarily a surface examination method that detects flaws open to the surface but does not provide insight into subsurface issues. Magnetic particle testing is effective for certain ferromagnetic materials and is also restricted to surface and near-surface defects. Acoustic emission techniques involve monitoring the sounds produced by released energy from defects but may not always reliably indicate the exact location or nature of subsurface flaws. Thus, while all these methods have their applications, radiography stands out for its comprehensive ability to reveal and assess subsurface deficiencies effectively.

8. What type of bridge superstructure is composed of a reinforced concrete slab?

- A. Beam bridge
- B. Arch bridge
- C. Slab bridge**
- D. Truss bridge

A slab bridge is characterized specifically by its construction using a reinforced concrete slab as the primary superstructure. This type of bridge relies on the strength and durability of the concrete slab to carry loads, often spanning shorter distances. The reinforced concrete provides the necessary structural integrity to support vehicular traffic or pedestrian use. In a slab bridge, the design is straightforward and offers an efficient way to create a robust surface without the need for additional structural elements such as beams or trusses. This makes slab bridges particularly suitable for applications where load requirements are moderate and spans are relatively short. The construction technique generally involves pouring concrete into a formwork that maintains the desired shape and dimensions of the slab, reinforcing it with steel bars or mesh to provide additional tensile strength. This contrasts with other types of bridges, which utilize different structural elements such as beams, arches, or trusses to distribute loads across greater spans or varying geometries.

9. Which of the following methods is not effective for inspecting large areas of concrete?

- A. Ground Penetrating Radar
- B. Impact Echo Test**
- C. Acoustic Wave Testing
- D. Vibration Testing

The impact echo test is a technique primarily used for evaluating the condition of concrete elements, particularly useful for detecting internal flaws such as delaminations, voids, or cracks. It involves imparting a mechanical impact to the concrete and measuring the resulting stress waves. While this method can provide valuable information about the condition of localized areas, it is less effective for inspecting large surfaces comprehensively. This is due to its reliance on point measurements at specific locations, which may miss issues that are spread across a broader area. On the other hand, methods like ground-penetrating radar, acoustic wave testing, and vibration testing are designed to cover larger areas more systematically. Ground-penetrating radar uses radar pulses to image the subsurface and can effectively scan extensive areas to detect anomalies beneath the concrete. Acoustic wave testing evaluates the propagation of sound waves through the concrete, which can cover larger regions and provide information about material integrity over a wider scope. Vibration testing can involve analyzing the vibrational characteristics of a structure, which can also reveal conditions across larger areas rather than being limited to point-specific insights. Therefore, while the impact echo test is useful for identifying specific problems in concrete, it is not as effective for a broad inspection of large concrete surfaces compared to the

10. Where can you find the guidelines for railing design and testing?

- A. ANSI Standards for Safety
- B. Federal Highway Administration Manual
- C. AASHTO Guide Specifications for Bridge Railings**
- D. American Concrete Institute Guidelines

The AASHTO Guide Specifications for Bridge Railings is the correct source for guidelines regarding railing design and testing. This document is specifically developed by the American Association of State Highway and Transportation Officials (AASHTO) to address the unique requirements related to bridge railings, including performance, testing, and design considerations. It establishes the necessary criteria and standards to ensure that railings are effective in providing safety for vehicles and pedestrians on bridges. In contrast, while the ANSI Standards for Safety, the Federal Highway Administration Manual, and the American Concrete Institute Guidelines may cover various aspects of safety and structural design, they do not focus exclusively on the specifics of bridge railing design and testing as the AASHTO guidelines do. Thus, for accurate and precise information related to bridge railings, the AASHTO Guide Specifications is the authoritative reference.

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://nhi-buildings.examzify.com>

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

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