

ACI Concrete Field Testing Technician - Grade I Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

This is a sample study guide. To access the full version with hundreds of 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. 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

- 1. Is a composite sample of concrete needed if the only purpose is to determine temperature?**
 - A. True**
 - B. False**
 - C. Only in large volumes**
 - D. Only if specified by the engineer**
- 2. What is the standard size of concrete cylinders used for strength testing?**
 - A. 2 inches by 4 inches**
 - B. 6 inches by 12 inches**
 - C. 3 inches by 6 inches**
 - D. 5 inches by 10 inches**
- 3. What is the minimum thickness for a glass or acrylic strike-off plate in the slump test?**
 - A. 1/4 in. [6 mm]**
 - B. 1/2 in. [12 mm]**
 - C. 3/4 in. [19 mm]**
 - D. 1 in. [25 mm]**
- 4. The pressure method of determining air content can be used on concrete made with what type of aggregate?**
 - A. Lightweight aggregate**
 - B. Relatively dense aggregate**
 - C. High porosity aggregate**
 - D. Recycled aggregate**
- 5. The temperature of concrete is reported to the nearest ____ degrees F.**
 - A. 1 degree F**
 - B. 2 degrees F**
 - C. 5 degrees F**
 - D. 10 degrees F**

- 6. If portions of undisturbed concrete are found in the air meter at the end of the test, what is the outcome?**
- A. The test is valid**
 - B. The test is incomplete**
 - C. The test is invalid**
 - D. The test can be repeated**
- 7. What material can be used to make the tamping rod, according to the requirements?**
- A. Aluminum**
 - B. Steel**
 - C. High-density polyethylene or equal**
 - D. Both steel and high-density polyethylene**
- 8. What is the correct temperature range for storing concrete test specimens?**
- A. -5°C to 5°C**
 - B. 10°C to 20°C**
 - C. 20°C to 30°C**
 - D. 5°C to 35°C**
- 9. Where is the measurement for slump taken from?**
- A. The bottom of the mold**
 - B. The top of the mold to the original center of the specimen**
 - C. The base of the mold to the top of the slumped concrete**
 - D. The overflow area around the mold**
- 10. What is the specified number of strokes required when rodding each layer of a concrete sample?**
- A. 15**
 - B. 20**
 - C. 25**
 - D. 30**

Answers

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

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Explanations

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1. Is a composite sample of concrete needed if the only purpose is to determine temperature?

A. True

B. False

C. Only in large volumes

D. Only if specified by the engineer

The determination of the temperature of concrete does not necessitate the collection of a composite sample. A single temperature reading can adequately reflect the concrete's state at the time of testing, rendering the need for a composite sample unnecessary. Temperature is typically measured using a thermometer inserted into the fresh concrete, allowing for an immediate and accurate reading without the need to aggregate samples from various sections of the pour, as would be done for other tests like slump or compressive strength. In situations where the main focus is solely on temperature, composite sampling—where samples are taken from different locations and mixed together—is not relevant. This is because temperature fluctuations can be measured directly and do not require the averaging effect of multiple samples, as is necessary for more comprehensive assessments of the concrete's properties.

2. What is the standard size of concrete cylinders used for strength testing?

A. 2 inches by 4 inches

B. 6 inches by 12 inches

C. 3 inches by 6 inches

D. 5 inches by 10 inches

The standard size of concrete cylinders used for strength testing is 6 inches by 12 inches. This size is commonly used in the construction industry as it provides an adequate volume of concrete for compressive strength testing while being large enough to minimize variability in test results. The dimensions allow for a practical balance between workability during casting and the strength needed for accurate assessment. The use of 6-inch by 12-inch cylinders is also consistent with ASTM C39, the standard test method for compressive strength of cylindrical concrete specimens, which specifies this dimension for standard testing. The larger size provides a greater surface area for applying the load evenly, leading to more reliable results when the specimen is subjected to compression. Other sizes like 2 inches by 4 inches, 3 inches by 6 inches, and 5 inches by 10 inches may be used in specialized situations or for specific tests, but they are not the standard for strength testing as outlined by ASTM standards. Using the standard size helps ensure consistency across tests and facilitates comparison of results across different projects and conditions.

3. What is the minimum thickness for a glass or acrylic strike-off plate in the slump test?

- A. 1/4 in. [6 mm]**
- B. 1/2 in. [12 mm]**
- C. 3/4 in. [19 mm]**
- D. 1 in. [25 mm]**

The minimum thickness for a glass or acrylic strike-off plate in the slump test is specified to be 1/4 inch (6 mm). This thickness is essential to ensure the plate is sturdy enough to provide a flat, smooth surface for leveling the fresh concrete sample without the risk of bending or breaking during use. A thicker plate may add unnecessary weight and difficulty in handling, while a thinner plate could compromise the integrity and accuracy of the test, potentially leading to inconsistent results. Having the appropriate thickness helps maintain the smoothness and stability of the strike-off process, ensuring that the concrete is struck off accurately at the right elevation, which is critical for obtaining reliable slump measurements.

4. The pressure method of determining air content can be used on concrete made with what type of aggregate?

- A. Lightweight aggregate**
- B. Relatively dense aggregate**
- C. High porosity aggregate**
- D. Recycled aggregate**

The pressure method of determining air content in concrete is best suited for mixtures that utilize relatively dense aggregates. This method relies on the principle that changes in air volume can be measured by the pressure exerted by the trapped air in the concrete sample. Relatively dense aggregates provide a stable matrix that allows for accurate measurements, as the density supports the containment of air bubbles without excessive pressure changes that could skew results. While lightweight aggregates can create a different air content profile due to their inherent properties, they may not yield reliable results with the pressure method due to their lower density and different structural characteristics. High porosity aggregates, on the other hand, could introduce complexities in measurement because their porous nature can significantly affect the distribution and volume of air. Recycled aggregates, though potentially usable in other contexts, may also have variable densities and surface characteristics that could complicate a consistent and accurate application of the pressure method. Thus, utilizing relatively dense aggregates is essential for achieving reliable and repeatable measurements of air content through this method in concrete mixtures.

5. The temperature of concrete is reported to the nearest _____ degrees F.

A. 1 degree F

B. 2 degrees F

C. 5 degrees F

D. 10 degrees F

The temperature of concrete is typically reported to the nearest 1 degree Fahrenheit because precision is important in ensuring proper curing and hydration of the concrete mix. Concrete's temperature can significantly affect its workability, setting time, and overall strength. Recording the temperature to the nearest degree helps technicians monitor conditions closely during the placement and curing process. This level of accuracy is necessary to maintain consistent quality control, particularly in varying environmental conditions. Reporting to a broader range, such as 2, 5, or 10 degrees, may not provide sufficient specificity needed for effective quality management in concrete field testing.

6. If portions of undisturbed concrete are found in the air meter at the end of the test, what is the outcome?

A. The test is valid

B. The test is incomplete

C. The test is invalid

D. The test can be repeated

When portions of undisturbed concrete are found in the air meter at the conclusion of the test, it indicates that the sample did not undergo the proper mixing and agitation necessary for accurate air content measurement. The air meter relies on a homogeneously mixed sample to provide reliable readings, ensuring that all air voids can effectively interact with the testing mechanism. The presence of undisturbed concrete suggests that the sample may have segregated or that the mixing process was insufficient, leading to an inaccurate and misleading measurement of air content. Therefore, this scenario qualifies the results as invalid. An invalid test means that the data cannot be used for quality control or assurance, and it emphasizes the need for proper sampling and mixing techniques to achieve reliable results in future tests. In this case, it is crucial to restart the testing process with a properly prepared sample to obtain an accurate air content measurement. While options indicating the test might be valid, incomplete or repeatable might seem plausible, they do not account for the significant implication of the undisturbed concrete presence, which undermines the reliability of the test results entirely.

7. What material can be used to make the tamping rod, according to the requirements?

- A. Aluminum**
- B. Steel**
- C. High-density polyethylene or equal**
- D. Both steel and high-density polyethylene**

The requirements for the tamping rod used in concrete testing specify that it should be made from materials that are durable and capable of effectively compacting concrete without causing any contamination or alteration to the test results. Steel is a commonly used material due to its strength, durability, and resistance to wear. High-density polyethylene is also acceptable as it is non-reactive and will not affect the concrete mix. Using either of these materials fulfills the necessary criteria for a proper tamping rod, allowing for consistent results during testing. Therefore, the option that includes both steel and high-density polyethylene accurately reflects the acceptable materials for the tamping rod as outlined in industry standards.

8. What is the correct temperature range for storing concrete test specimens?

- A. -5°C to 5°C**
- B. 10°C to 20°C**
- C. 20°C to 30°C**
- D. 5°C to 35°C**

The proper temperature range for storing concrete test specimens is 5°C to 35°C. This range is crucial because it ensures that the specimens cure under conditions that closely mimic the intended environmental conditions of the concrete once placed in service. Storing specimens within this range helps to achieve accurate and reliable strength and durability results, as extreme variations in temperature can adversely affect the hydration process of the cement and the overall development of strength in the concrete. In colder temperatures (below 5°C), the hydration process slows significantly, which can lead to incomplete curing and ultimately weakened concrete. Conversely, at temperatures above 35°C, there is a risk of rapid evaporation of water from the surface of the concrete, which can result in superficial drying and the possibility of cracking or other forms of distress. Maintaining the specimens within the specified temperature range helps to create a controlled environment that supports uniform curing conditions, which is essential for ensuring that the test results accurately reflect the performance characteristics of the concrete mix under typical field conditions. This practice aligns with industry standards and recommendations by organizations such as ASTM and ACI, emphasizing the importance of temperature control in the curing of concrete specimens.

9. Where is the measurement for slump taken from?

- A. The bottom of the mold**
- B. The top of the mold to the original center of the specimen**
- C. The base of the mold to the top of the slumped concrete**
- D. The overflow area around the mold**

The measurement for slump is specifically taken from the top of the mold to the original center of the specimen. This method is crucial because it provides an accurate representation of the deformation of the concrete after the mold has been removed. The slump test is intended to measure the consistency and workability of fresh concrete, and the distance measured reflects how much the concrete has settled under its own weight. Using the original center of the specimen as a reference point ensures that variations in concrete placement or density do not skew the results, thus allowing for reliable comparisons across different tests. Each slump measurement is then standardized to this starting point to maintain consistency and accuracy in evaluating the concrete's properties.

10. What is the specified number of strokes required when rodding each layer of a concrete sample?

- A. 15**
- B. 20**
- C. 25**
- D. 30**

The specified number of strokes required when rodding each layer of a concrete sample is 25. This standard is established to ensure that the concrete is properly consolidated in the mold, which is critical for obtaining an accurate measurement of the mix's properties, such as its strength and workability. When performing this task, each layer of concrete is typically placed in the mold in increments, and rodding is used to eliminate air voids and ensure uniform compaction. The requirement of 25 strokes for each layer helps achieve a consistent and homogeneous sample, which ultimately leads to more reliable test results. This standardization is crucial in the field of concrete testing as it minimizes variability and enhances the reproducibility of test outcomes. Using fewer or excessive strokes can lead to either inadequate consolidation or over-compaction, both of which can significantly impact the test results and the quality assessment of the concrete mixture. Therefore, adhering to the established guideline of 25 strokes is essential for accurate and effective concrete field testing.

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://aci-i.examzify.com>

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