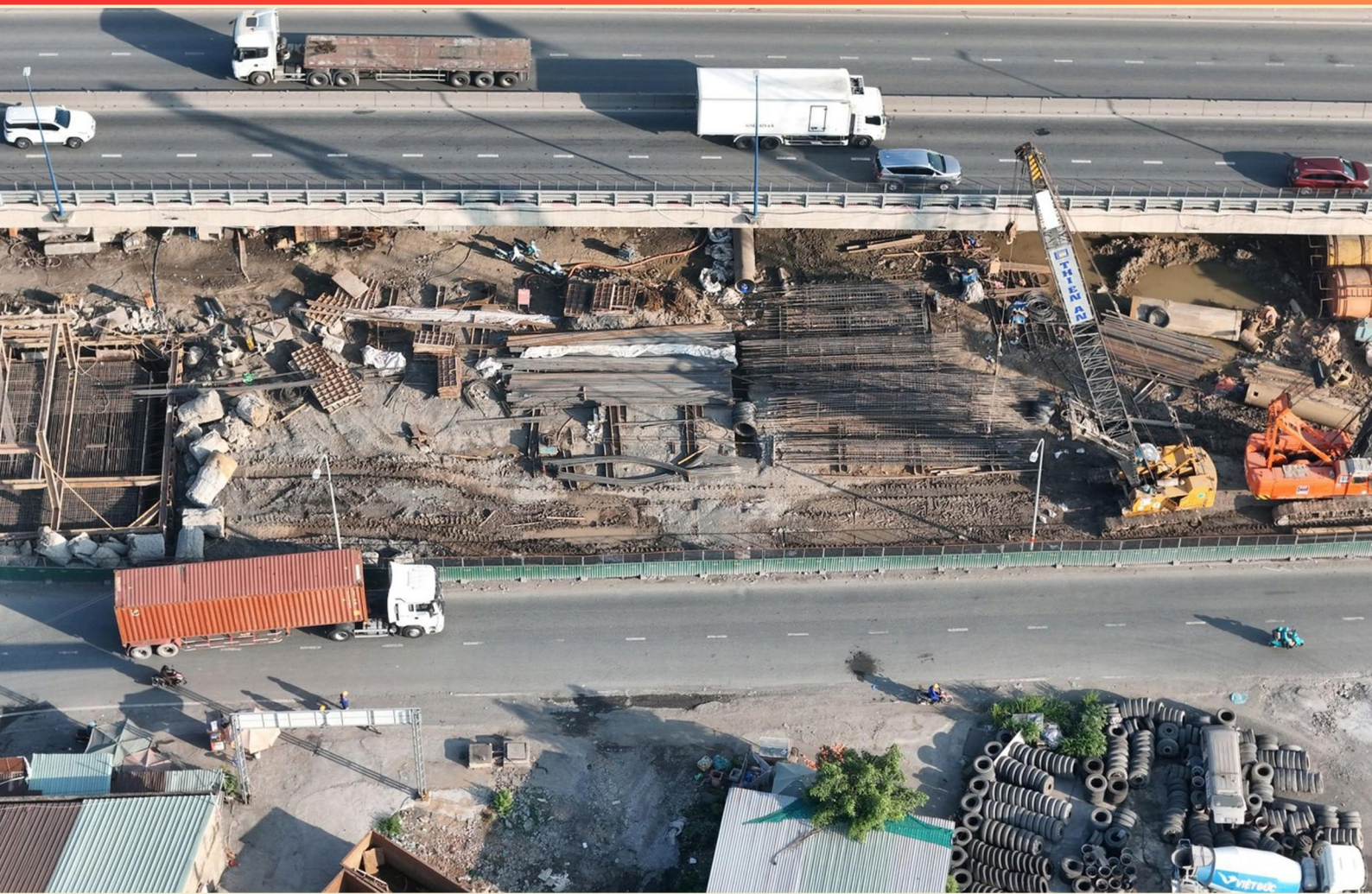


NATIONAL COUNCIL OF EXAMINERS FOR ENGINEERING AND SURVEYING (NCEES) FUNDAMENTALS OF ENGINEERING (FE) CIVIL PRACTICE EXAM (SAMPLE)

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.

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 does the term "cut" refer to in earthwork?**
 - A. Soil being added to an embankment
 - B. Soil being compacted
 - C. Earth that is to be excavated
 - D. The final grading of the site
- 2. Cost per unit of production (CPP) is affected by which of the following?**
 - A. The volume of materials used
 - B. The amount of time required to complete the work relative to equipment costs
 - C. The type of labor used on site
 - D. Weather conditions during construction
- 3. What is the standard length of the tapes used for cut chains in surveying?**
 - A. 50' long tapes
 - B. 100' long tapes
 - C. 150' long tapes
 - D. 200' long tapes
- 4. Which of the following factors primarily contributes to queueing delay?**
 - A. Signal timing adjustments
 - B. Control delays
 - C. Negotiation of turns at intersections
 - D. Presence of vehicles already waiting
- 5. Which disinfectant is most commonly used in water treatment?**
 - A. Chlorine
 - B. Bromine
 - C. Ozone
 - D. UV light
- 6. What is the ultimate goal of effective project management in civil engineering?**
 - A. To minimize costs at all stages
 - B. To ensure the successful completion of projects
 - C. To accelerate the construction phase
 - D. To optimize material usage

7. Which footing primarily supports load from a single vertical column?

- A. Strip footing
- B. Cantilever footing
- C. Spread footing
- D. Combined footing

8. What is the first step in the cost estimating process?

- A. Preparing the bid proposal
- B. Determining the quantity of materials and labor
- C. Submitting a project bid
- D. Preparing a cost summary

9. What type of loading is evaluated in a direct shear test?

- A. Axial loading
- B. Hydrostatic loading
- C. Shear loading
- D. Bending moments

10. When considering equipment for construction, which factor is most critical?

- A. Color and appearance
- B. Capability to perform work
- C. Brand reputation
- D. Availability of spare parts

Answers

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

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Explanations

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1. What does the term "cut" refer to in earthwork?

- A. Soil being added to an embankment
- B. Soil being compacted
- C. Earth that is to be excavated**
- D. The final grading of the site

The term "cut" in earthwork refers specifically to the process of excavating or removing soil from a site, typically to create a level base for construction or to lower the elevation of the ground. In construction and civil engineering contexts, cuts are often made in preparation for roads, buildings, or other structures. When a project requires a change in elevation, such as lowering the grade to facilitate drainage or foundation work, "cut" denotes the volume of earth that needs to be dug up. This is crucial for determining the quantity of material that will either be removed from the project site or moved to other areas, such as leveling or filling elsewhere. Other options do not accurately represent the concept of cut. Adding soil to an embankment is known as filling, while compacting soil refers to the process of increasing soil density through mechanical means, and final grading pertains to the smoothing and leveling of the surface after earthwork has been completed. Understanding these definitions helps clarify the critical distinction between cut and other phases of earthwork operations.

2. Cost per unit of production (CPP) is affected by which of the following?

- A. The volume of materials used
- B. The amount of time required to complete the work relative to equipment costs**
- C. The type of labor used on site
- D. Weather conditions during construction

Cost per unit of production (CPP) is indeed influenced significantly by the amount of time required to complete the work relative to equipment costs. This relationship arises because equipment typically incurs fixed costs that must be allocated over the units of production. If a project takes longer than anticipated, these costs are spread over fewer units, thus increasing the cost per unit. Time also directly correlates with labor costs, as extended durations may require additional labor hours, further contributing to the total cost. Consequently, the efficiency and time management of a project are pivotal elements in determining CPP. Adjustments in scheduling, resource allocation, and equipment utilization can therefore lead to substantial impacts on the overall cost efficiency of production. The other factors mentioned do contribute to overall project costs, but they do not have as immediate an impact on CPP. For example, while the volume of materials used can affect total expenses, it doesn't directly change the per unit cost unless it leads to significant wastage or inefficiencies. Similarly, the type of labor used may influence productivity and costs, yet it is the time taken that typically creates the most considerable variation in CPP. Weather conditions can indeed affect productivity and project timelines but are generally considered external variables that impact overall project schedules rather than a direct adjustment in CPP calculation.

3. What is the standard length of the tapes used for cut chains in surveying?

- A. 50' long tapes
- B. 100' long tapes**
- C. 150' long tapes
- D. 200' long tapes

The standard length of tapes used for cut chains in surveying is typically 100 feet. This choice is prevalent due to its practicality in various surveying applications, which often require distances that are manageable to handle while still covering substantial areas. A 100-foot tape is convenient because it allows for easy measurement in both small and medium-scale surveying tasks. When performing measurements, using a tape of this length enables surveyors to efficiently gauge distances without needing to constantly reposition the tape or fuse smaller increments together. Tapes longer than 100 feet, such as 150-foot or 200-foot options, may be less common for standard measurements in everyday surveying as they can become cumbersome. They are often reserved for specific applications where longer stretches need to be covered in a single measurement, but for the majority of routine surveying tasks, the 100-foot tape strikes an ideal balance between usability and length. 50-foot tapes, while useful in certain contexts, are not commonly referred to as standard for chains due to their shorter reach, which limits their versatility in larger surveying projects. This explains why the 100-foot tape is recognized as the standard length in the surveying profession.

4. Which of the following factors primarily contributes to queueing delay?

- A. Signal timing adjustments
- B. Control delays
- C. Negotiation of turns at intersections
- D. Presence of vehicles already waiting**

The primary factor that contributes to queueing delay is the presence of vehicles already waiting. Queueing delay occurs when vehicles are placed in a line, typically at intersections or traffic signals, due to demand exceeding the available capacity. When there are vehicles already waiting, it leads to an increased queue length and consequently prolongs the time any new vehicles must wait to clear that intersection or reach their destination. The accumulation of vehicles creates a situation where the flow of traffic is impeded, and new arrivals must wait until those already in the queue can move forward. This delay is inherently tied to the existing traffic conditions, particularly the volume of traffic and the rate at which it can move through the intersection or road segment. In contrast, while signal timing adjustments and control delays can influence overall traffic flow, they are not the primary cause of queueing delay. These factors may help optimize traffic movement but do not create the queue itself. Similarly, the negotiation of turns at intersections can lead to delays, but again, the actual queueing delay is fundamentally tied to the presence of vehicles already waiting in that queue.

5. Which disinfectant is most commonly used in water treatment?

A. Chlorine

B. Bromine

C. Ozone

D. UV light

Chlorine is the most commonly used disinfectant in water treatment due to its effectiveness, longevity, and cost-efficiency. It is a powerful biocide that can eliminate a wide range of pathogens, including bacteria and viruses, thus ensuring the safety of drinking water. One of its key advantages is its ability to form chloramines when it reacts with ammonia in water, which helps maintain residual disinfection throughout the distribution system, providing ongoing protection against microbial regrowth. Chlorine is also readily available and can be applied easily, either in gas form or as liquid compounds such as sodium hypochlorite. Its use has been established for more than a century, allowing for extensive research on its effectiveness and safety, which further solidifies its position as the primary method of disinfection in municipal water systems. While other disinfectants like ozone and UV light provide effective disinfection as well, they often lack the residual effect that chlorine offers, making them less practical for long-term water treatment solutions. Ozone, for instance, is an excellent oxidant that can effectively kill microorganisms, but it does not provide lasting disinfection in the water distribution system. Furthermore, UV light requires careful handling and monitoring, as it does not leave any residual chemical in the water.

6. What is the ultimate goal of effective project management in civil engineering?

A. To minimize costs at all stages

B. To ensure the successful completion of projects

C. To accelerate the construction phase

D. To optimize material usage

The ultimate goal of effective project management in civil engineering is to ensure the successful completion of projects. This encompasses a wide range of objectives, including meeting project requirements, adhering to timelines, staying within budget, and ensuring quality outcomes. Successful project management involves careful planning, coordination of resources, and effective communication among all stakeholders involved in the project, such as engineers, contractors, and clients. By focusing on successful completion, project managers can align various project constraints—such as scope, schedule, and cost—while also addressing risks and establishing performance metrics. This holistic approach not only leads to the completion of the project but also enhances client satisfaction and establishes a foundation for future projects by building a reputation for reliability and efficiency. While minimizing costs, accelerating construction phases, and optimizing material usage are important considerations in project management, these aspects serve as tools to achieve the primary goal of successful project completion. They enhance the overall project success but do not encompass the full scope of what effective project management aims to accomplish.

7. Which footing primarily supports load from a single vertical column?

- A. Strip footing
- B. Cantilever footing
- C. Spread footing**
- D. Combined footing

The spread footing is designed specifically to support vertical loads from a single column. It provides a larger base area that helps to distribute the load over a wider area of soil, reducing the pressure exerted on the ground and minimizing the risk of settlement or failure. Spread footings are commonly used in situations where a single concentrated load needs to be transmitted efficiently to the underlying soil, allowing for adequate load bearing while ensuring structural integrity. In contrast, a strip footing is intended for continuous loads, such as those from walls, and is not suitable for supporting individual columns. Cantilever footings are used in scenarios where one side is free and are typically employed in retaining walls or overhanging structures, rather than for supporting single columns. Combined footings serve to distribute loads from two or more columns, effectively allowing them to share the footing; therefore, they are not specifically meant for just one column. Each of these alternatives has distinct applications, making the spread footing the most appropriate choice for supporting loads from a single vertical column.

8. What is the first step in the cost estimating process?

- A. Preparing the bid proposal
- B. Determining the quantity of materials and labor
- C. Submitting a project bid**
- D. Preparing a cost summary

The first step in the cost estimating process is determining the quantity of materials and labor. This critical initial phase involves quantifying exactly what resources will be needed for a project, which directly influences the overall cost estimation. Before any bid proposal can be prepared or submitted, a clear understanding of the project requirements is essential. This includes identifying the types and amounts of materials required, as well as the labor hours needed to execute the tasks. Accurate quantity takeoffs ensure that the subsequent cost estimation reflects realistic expenses. Only after this quantity determination can the estimator prepare a cost summary, develop a bid proposal, or submit a project bid. Each of these subsequent steps relies on the foundational information established during the quantity determination phase, making it the logical starting point for the entire cost estimating process.

9. What type of loading is evaluated in a direct shear test?

- A. Axial loading
- B. Hydrostatic loading
- C. Shear loading**
- D. Bending moments

In a direct shear test, the primary focus is on evaluating shear loading directly applied to a material, typically soil or other geotechnical materials. This test is designed to measure the shear strength of the material as it is subjected to this specific type of load. The setup involves placing a specimen within a shear box and applying a horizontal force until the specimen fails in shear along a defined plane. Understanding shear loading is crucial in geotechnical engineering because it helps assess the stability of slopes, foundations, and any structure that relies on soil or other materials to maintain its integrity under various load conditions. By determining the shear strength in a controlled manner, engineers can predict how materials will behave under different loading scenarios, ensuring the safety and reliability of structures. The other types of loading mentioned are distinct and do not pertain to the direct shear test. Axial loading involves forces applied parallel to an object's axis, hydrostatic loading pertains to pressures exerted by fluids at rest, and bending moments relate to the bending effects on beams and structures subjected to lateral forces. Therefore, they are not relevant to the context of the direct shear test.

10. When considering equipment for construction, which factor is most critical?

- A. Color and appearance
- B. Capability to perform work**
- C. Brand reputation
- D. Availability of spare parts

The capability to perform work is the most critical factor when selecting equipment for construction because the primary purpose of any equipment is to efficiently and effectively carry out the specific tasks required for a project. The equipment must meet the performance requirements needed for the job, such as load capacity, speed, accuracy, and suitability for the specific type of work being conducted. Choosing equipment based solely on color and appearance does not contribute to its functionality or efficiency on the construction site. Similarly, while brand reputation can provide insight into the manufacturer's quality and reliability, it does not guarantee that the equipment will meet the specific operational needs of the project. Availability of spare parts is important for maintenance and minimizing downtime, but if the equipment cannot perform the necessary tasks effectively, spare parts won't help achieve project goals. Therefore, the ability of the equipment to meet the demands of the job at hand is paramount in construction planning and execution.

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://ncees-fundamentalsofengineeringcivil.examzify.com>

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

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