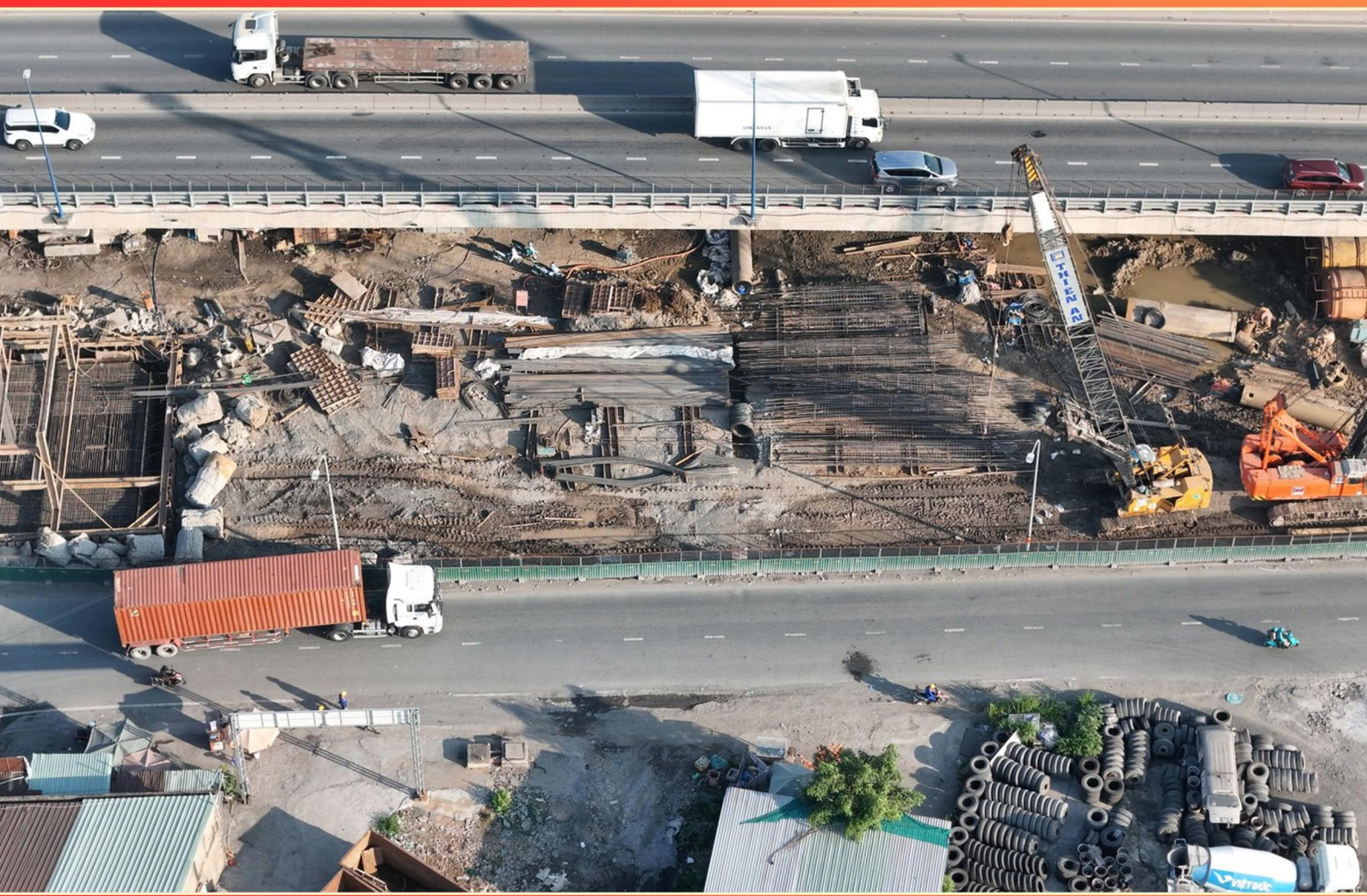
NATIONAL COUNCIL OF EXAMINERS FOR ENGINEERING AND SURVEYING (NCEES) FUNDAMENTALS OF ENGINEERING (FE) CIVIL PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://ncees-fundamentalsofengineeringcivil.examzify.com

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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. What characterizes Turbid Waters?

A. Waters with low concentrations of dissolved solids

B. Waters that have undergone disinfection

C. Waters with high concentrations of suspended solids

D. Waters that are free of contaminants

2. Which surveying method integrates theodolites with electronic distancing measurement?

A. Total Station Surveys

B. Plane Surveys

C. Stadia Survey

D. Photogrammetric Surveys

3. What is the maximum value for azimuth angles?

A. 180 degrees

B. 90 degrees

C. 360 degrees

D. 270 degrees

4. What do Free Chlorine Residuals refer to?

A. Only the chlorine that evaporates during treatment

B. The amount of chlorine remaining after water treatment

C. The complete removal of chlorine from water

D. Chlorine compounds added during initial disinfection

5. What component comprises the Total Nitrogen (TN) calculation?

A. Nitrates + nitrites

B. Nitrates + nitrites + ammonia

C. Nitrates + phosphates

D. Nitrates + ammonia + phosphates

6. When soil is said to be in "bank-measure," what state is it in?

A. In its compacted and usable state

B. In its natural and undisturbed state

C. In a loose and disturbed state

D. In a transported and relocated state

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7. What is liquefaction in soil mechanics?

A. A gradual increase in soil strength

B. A sudden drop in shear strength of saturated soils

C. A phenomenon of soil drying out

D. A condition leading to soil erosion

8. 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

9. What does 'passing sight distance' describe?

A. The distance required to safely pass another vehicle

B. The distance available for pedestrians to cross

C. The gap in traffic allowing safe merging

D. The view distance available on straight roads

10. What does the term "excavation" refer to in civil engineering?

A. A reinforced concrete structure

B. The bottom of a water body

C. A place where soil has been removed from its original location

D. The angle of soil inclination

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Answers

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

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Explanations

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1. What characterizes Turbid Waters?

A. Waters with low concentrations of dissolved solids

B. Waters that have undergone disinfection

C. Waters with high concentrations of suspended solids

D. Waters that are free of contaminants

Turbid waters are characterized by having high concentrations of suspended solids. This turbidity is often due to particulate matter such as silt, clay, organic matter, or microorganisms that are present in the water, which scatter and absorb light, leading to reduced clarity. High suspended solids can indicate various conditions such as erosion in surrounding environments, runoff from land, or disturbances in the water body, and it can also impact aquatic life by reducing light penetration and affecting photosynthesis. The presence of these suspended solids can be crucial in understanding water quality, as high turbidity can obstruct feeding and breeding processes for aquatic organisms, contribute to changes in temperature, and affect the overall health of the ecosystem. Thus, recognizing that turbid waters have a high concentration of suspended solids is essential for managing water resources and maintaining environmental quality.

2. Which surveying method integrates theodolites with electronic distancing measurement?

A. Total Station Surveys

B. Plane Surveys

C. Stadia Survey

D. Photogrammetric Surveys

The method that integrates theodolites with electronic distance measurement is Total Station Surveys. A Total Station is an advanced surveying instrument that combines a theodolite for measuring angles and an electronic distance measuring device (EDM) for determining distances, allowing for precise measurements of both horizontal and vertical angles, as well as distance in a single, efficient process. This integration enhances the speed and accuracy of surveying tasks, making it a common choice for land surveying, construction, and civil engineering projects. In contrast, the other methods mentioned do not utilize this combination. Plane surveys focus solely on two-dimensional mapping or layout without the electronic components. Stadia surveys use a different technique based on the principle of a level staff and a telescope but do not incorporate electronic measurement technology. Photogrammetric surveys are based on taking photographs and extracting measurements from them rather than using a theodolite or EDM. Therefore, the unique functionalities of Total Station Surveys make them the correct answer in this context.

3. What is the maximum value for azimuth angles?

A. 180 degrees

B. 90 degrees

C. 360 degrees

D. 270 degrees

Azimuth angles are used to indicate direction in a horizontal plane and are an essential concept in fields such as surveying, navigation, and engineering. The azimuth is measured in degrees from a reference direction, typically true north, moving clockwise around a complete circle. The full circle is divided into 360 degrees, which allows for a complete representation of all possible directions. Therefore, the maximum value for an azimuth angle is 360 degrees, which corresponds to a full rotation back to the reference direction of true north. This 360-degree measurement ensures that all angles from 0 degrees (north) to 359 degrees (just before returning to north) are accounted for and provide a comprehensive method to describe any direction in two-dimensional space.

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4. What do Free Chlorine Residuals refer to?

A. Only the chlorine that evaporates during treatment

B. The amount of chlorine remaining after water treatment

C. The complete removal of chlorine from water

D. Chlorine compounds added during initial disinfection

Free Chlorine Residuals refer specifically to the amount of chlorine that remains in the water after the disinfection process has been completed but prior to the water being released for use. This measurement is crucial as it indicates the effectiveness of the chlorination process in eliminating pathogens and serves as a safeguard against future contamination. In the context of water treatment, maintaining an appropriate level of free chlorine residual is essential for ensuring the safety of drinking water and preventing microbial growth in the distribution system. This residual is typically the form of chlorine that is available for disinfection, distinguishing it from chlorine that has reacted with contaminants in the water or combined chlorine compounds, which are not as effective in killing bacteria and other pathogens. The focus on the residual chlorine supports the importance of continuous monitoring of water quality, making option B the correct understanding of Free Chlorine Residuals.

5. What component comprises the Total Nitrogen (TN) calculation?

A. Nitrates + nitrites

B. Nitrates + nitrites + ammonia

C. Nitrates + phosphates

D. Nitrates + ammonia + phosphates

Total Nitrogen (TN) is a key parameter in water quality analysis, especially when assessing the health of aquatic systems or the effectiveness of wastewater treatment processes. TN encompasses all forms of nitrogen present in a water sample. This includes nitrates, nitrites, and ammonia. Nitrates and nitrites are both inorganic forms of nitrogen that can be found in various concentrations due to runoff, wastewater effluents, or biological activities in water bodies. Ammonia, which can be present in both ionized (ammonium form) and un-ionized forms, is another significant component as it often originates from organic matter decomposition, fertilizers, and sewage. To accurately reflect the total nitrogen content in a water body, the summation of these three nitrogen forms—nitrates, nitrites, and ammonia—must be included. This collective measurement is essential for evaluating pollution load and ensuring that water quality standards are met. Thus, the calculation involves the addition of all three components, making the choice that includes nitrates, nitrites, and ammonia the correct one for TN calculation. The other combinations do not account for all components of total nitrogen, omitting either ammonia or phosphates, which are irrelevant to nitrogen calculations. Therefore, the correct understanding

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6. When soil is said to be in "bank-measure," what state is it in?

A. In its compacted and usable state

B. In its natural and undisturbed state

C. In a loose and disturbed state

D. In a transported and relocated state

When soil is described as being in "bank-measure," it refers to the condition where the soil is in its natural, undisturbed state, as it exists in the ground before any excavation or disturbance occurs. This means that the soil hasn't been compacted or loosened through human activity, nor has it been transported from its original location. In bank-measure, the volume of soil is considered in the state it occupies naturally, which is important in engineering and construction because it serves as a basis for volume calculations, material estimations, and understanding the soil's characteristics for projects. This natural condition contrasts with the other states mentioned: compacted and usable state would imply alterations and modifications to the soil; loose and disturbed state indicates that the soil has been excavated or manipulated; and transported and relocated state suggests that the soil has been moved from its original location, which would change both its volume and properties. Understanding soil in its bank-measure state helps professionals in civil engineering and surveying accurately assess the material they are working with.

7. What is liquefaction in soil mechanics?

A. A gradual increase in soil strength

B. A sudden drop in shear strength of saturated soils

C. A phenomenon of soil drying out

D. A condition leading to soil erosion

Liquefaction in soil mechanics refers to the phenomenon where saturated soil substantially loses strength and stiffness in response to applied stress, often during an earthquake or other rapid loading conditions. This loss of strength occurs due to the buildup of pore water pressure within the soil, which reduces the effective stress and leads the soil to behave more like a liquid than a solid. In cases where the saturated granular soil experiences cyclic loading, such as during seismic events, the grain-to-grain contact forces can be disrupted, resulting in a sudden and significant reduction in shear strength. The soil can then flow under its own weight, potentially leading to severe ground deformation, loss of bearing capacity for structures, and even completion of landslides. The other choices do not accurately describe liquefaction. A gradual increase in soil strength would refer to processes such as consolidation or compaction, which are opposite to what occurs during liquefaction. The idea of soil drying out relates to desiccation or shrinkage, which is also not directly related to the loss of strength under saturation. Lastly, while liquefaction can contribute to erosion in some cases, it primarily describes the dramatic and sudden drop in shear strength attributed to pore pressure changes rather than the erosion itself.

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8. 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.

9. What does 'passing sight distance' describe?

A. The distance required to safely pass another vehicle

B. The distance available for pedestrians to cross

C. The gap in traffic allowing safe merging

D. The view distance available on straight roads

'Passing sight distance' refers specifically to the distance needed for a vehicle to safely complete a passing maneuver on a two-lane road. This measurement includes the distance that the driver needs to see ahead to ensure that there is enough visibility to overtake a slower vehicle without encountering oncoming traffic. This concept is crucial for roadway design and safety, as it allows road engineers to determine the necessary sightlines and road characteristics needed to facilitate safe passing. The criteria for calculating passing sight distance incorporate factors such as vehicle speed, acceleration, and the driver's perception-reaction time. A road lacking adequate passing sight distance may contribute to dangerous situations where drivers misjudge the safety of passing maneuvers. The other choices address different aspects of traffic and pedestrian management. The distance available for pedestrians to cross pertains to crosswalk design and safety measures, while the gap in traffic concerns merging scenarios, and the view distance available on straight roads relates to overall visibility but not specifically to passing maneuvers. These distinctions highlight why the concept of passing sight distance is uniquely focused on the safe overtaking of vehicles.

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10. What does the term "excavation" refer to in civil engineering?

A. A reinforced concrete structure

B. The bottom of a water body

C. A place where soil has been removed from its original location

D. The angle of soil inclination

The term "excavation" in civil engineering refers to a process where soil or rock is removed from its original location to create a cavity, trench, or hole. This activity is essential for various construction projects, as it prepares the site for foundations, basements, underground utilities, and other structures. Excavation can involve different techniques and equipment, depending on the depth and volume of material being removed, as well as the site's geological conditions. For example, when preparing a site for a building, excavation is critical to ensure that the foundation can be laid on stable ground. The removed material is often referred to as "excavated material," which can then be transported or used elsewhere, depending on project requirements. The other provided options do not accurately capture the meaning of "excavation." A reinforced concrete structure is a type of construction technique unrelated to the removal of soil. The bottom of a water body does not pertain to the concept of excavation, which is focused on soil removal. Finally, the angle of soil inclination does not represent excavation itself but is more related to slope stability and the behavior of soil in geotechnical engineering contexts. This understanding of excavation is critical for ensuring proper construction and safety practices in civil engineering projects.

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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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