

# **GERTC MASTER OF SCIENCE IN SANITARY ENGINEERING (MSTC) PRACTICE EXAM (SAMPLE) STUDY GUIDE**



## **SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS**

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THE FULL VERSION STUDY GUIDE**

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# Table of Contents

|                             |    |
|-----------------------------|----|
| Copyright .....             | 1  |
| Table of Contents .....     | 2  |
| Introduction .....          | 3  |
| How to Use This Guide ..... | 4  |
| Questions .....             | 5  |
| Answers .....               | 8  |
| Explanations .....          | 10 |
| Next Steps .....            | 16 |

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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. In excavation, what determines the difficulty of the loading process?**
  - A. The availability of machinery
  - B. The loadability of the soil
  - C. The type of construction project
  - D. The skill level of the workers
- 2. What is the term for the path through the network that establishes the minimum project duration?**
  - A. Critical chain
  - B. Critical path
  - C. Project timeline
  - D. Performance baseline
- 3. Which method is suitable for compacting medium- to high-slump concrete?**
  - A. Vibrating
  - B. Spading
  - C. Rolling
  - D. Sliding
- 4. What is the purpose of ground modification or soil stabilization?**
  - A. To build new structures from scratch
  - B. To improve soils in place
  - C. To add decorative elements to the soil
  - D. To support existing structures
- 5. What is the term used for a surface treatment involving a layer of asphalt and aggregate?**
  - A. Single-pass surface treatment
  - B. Cemented surface treatment
  - C. Double-pass surface treatment
  - D. Composite surface treatment

- 6. Which method involves dropping a heavy weight to densify soil?**
- A. Dynamic compaction
  - B. Static compaction
  - C. Vibratory compaction
  - D. Soil replacement
- 7. What foundation type is considered the simplest and most common among builders?**
- A. Spread footing
  - B. Mat foundation
  - C. Floating foundation
  - D. Basement foundation
- 8. What are admixtures used for in concrete?**
- A. To only enhance the color
  - B. To improve the properties of concrete in various ways
  - C. To reduce the initial cost of materials
  - D. To ensure concrete complies with building codes
- 9. What type of costs does total equipment owning cost include?**
- A. Only service costs and repair costs
  - B. Only depreciation and insurance costs
  - C. Investment, insurance, tax, storage, and repair costs
  - D. Maintenance and labor costs only
- 10. What is the finishing technique used on slabs to produce a smooth surface intended for thin finishes like tiles or paint?**
- A. Floating
  - B. Troweling
  - C. Broom finishing
  - D. Jointing

## **Answers**

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

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## **Explanations**

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## 1. In excavation, what determines the difficulty of the loading process?

- A. The availability of machinery
- B. The loadability of the soil**
- C. The type of construction project
- D. The skill level of the workers

*The loadability of the soil is a critical factor in determining the difficulty of the loading process during excavation. This term refers to how easily the soil can be loaded onto trucks or other transport vehicles. Soil characteristics such as moisture content, compaction, consistency, and type (e.g., clay, sand, silt) all play significant roles in this aspect. For example, looser, drier soils tend to load more easily compared to heavily compacted or wet soils, which can adhere to equipment and be difficult to manage. If the soil is too dense or cohesive, it may require additional effort or equipment for loading, which can increase the complexity and time required for excavation activities. Understanding the loadability allows project managers to plan appropriately for the equipment needed and the overall schedule for excavation work, thereby directly impacting the project's efficiency and cost. While factors like the availability of machinery, the type of construction project, and the skill level of workers are certainly influential in the overall excavation process, they do not primarily dictate the inherent difficulty of loading the material itself. Instead, these aspects may affect how effectively the excavation can be carried out, but they stem from the properties of the soil which fundamentally determine how the loading process will unfold.*

## 2. What is the term for the path through the network that establishes the minimum project duration?

- A. Critical chain
- B. Critical path**
- C. Project timeline
- D. Performance baseline

*The term that signifies the path through a project network which establishes the minimum duration required to complete a project is known as the critical path. This concept is essential in project management, particularly in scheduling, as it identifies the sequence of tasks that directly affects the project's finish time. Any delay in the tasks along the critical path will result in a corresponding delay in the entire project. The critical path is determined by calculating the longest stretch of dependent activities and measuring the time required to complete them from start to finish. This path helps project managers prioritize tasks that cannot be delayed without affecting the project's overall timeline. On the other hand, the critical chain refers to a method that takes into account resource availability while planning the project, which differs from the critical path method. The project timeline refers more generally to the schedule of the entire project, rather than focusing specifically on the duration of dependent tasks. The performance baseline is part of the project's performance measurement, typically established to compare actual project performance against planned performance, rather than determining the minimum duration of project tasks.*

### 3. Which method is suitable for compacting medium- to high-slump concrete?

- A. Vibrating
- B. Spading**
- C. Rolling
- D. Sliding

*The appropriate method for compacting medium- to high-slump concrete is spading. This technique is effective for this type of concrete because it involves using a tool to push or pull the concrete around, which allows for the removal of air bubbles and enhances the density of the concrete mix. Given that medium- to high-slump concrete tends to be more fluid, spading can help in ensuring that the material flows into the forms properly while still consolidating the concrete effectively to achieve a strong, durable finish. In contrast, while vibrating is commonly used for consolidating concrete, it may not be ideal for high-slump mixes because excessive vibration can lead to segregation of the aggregates. Rolling is generally more suited for thicker or denser materials and may not effectively compact high-slump concrete. Sliding lacks the specific action needed to facilitate proper consolidation in concrete work. Each method has its strengths, but for medium- to high-slump concrete, spading is the most suitable choice to achieve the desired compaction.*

### 4. What is the purpose of ground modification or soil stabilization?

- A. To build new structures from scratch
- B. To improve soils in place**
- C. To add decorative elements to the soil
- D. To support existing structures

*The purpose of ground modification or soil stabilization is primarily to improve soils in place. This technique aims to enhance the properties of the existing soil, making it more suitable for construction activities and ensuring it can bear the loads imposed by structures or heavy traffic. By altering the soil's physical and mechanical characteristics – such as increasing its strength, reducing its compressibility, or improving its drainage capacity – soil stabilization allows for safer and more effective foundations and infrastructure development. In contrast, building new structures from scratch typically relies on already stable soil conditions or the introduction of engineered fill, rather than modification of the existing soil. Adding decorative elements to the soil does not relate to the engineering principles behind soil stabilization, as it focuses on aesthetics rather than functionality or load-bearing capacity. Supporting existing structures may be a consequence of improved soils, but the direct objective of soil stabilization is to enhance the soil itself, rather than simply serving as a means to support structures that are already in place.*

**5. What is the term used for a surface treatment involving a layer of asphalt and aggregate?**

- A. Single-pass surface treatment**
- B. Cemented surface treatment
- C. Double-pass surface treatment
- D. Composite surface treatment

*The term "single-pass surface treatment" refers to a method in which a single application of asphalt and aggregate is spread over a prepared surface. This technique is commonly used to enhance the surface of roads, providing a smooth finish while sealing the underlying layers to protect against water infiltration and weathering. The appropriate combination of asphalt and aggregate helps to create a durable and skid-resistant surface, which is essential for maintaining road safety and longevity. In comparison, other treatments such as double-pass surface treatments would involve two separate applications, resulting in different maintenance and performance characteristics than a single application. Cemented surface treatments typically refer to those that use cementitious materials rather than asphalt, which is not the focus here. Composite surface treatment might imply a combination of different materials or methods, but it does not specifically relate to the single application technique that is described in this case. Thus, single-pass surface treatment accurately captures the process outlined in the question.*

**6. Which method involves dropping a heavy weight to densify soil?**

- A. Dynamic compaction**
- B. Static compaction
- C. Vibratory compaction
- D. Soil replacement

*The method of dynamic compaction involves dropping a heavy weight onto the soil surface, which imparts a significant amount of energy into the ground. This process increases the soil density by rearranging the soil particles closer together, effectively reducing void spaces and enhancing the load-bearing capacity of the soil. Dynamic compaction is typically used in areas where deep soil stabilization is necessary, such as under foundations for buildings or other structures. In contrast, static compaction involves applying a steady weight over the soil, which does not provide the sudden impact energy that dynamic compaction does. Vibratory compaction uses vibrational forces to induce rearrangement of soil particles, relying on oscillation rather than weight drop. Soil replacement involves excavating existing soil and replacing it with new, compacted material, which does not utilize the weight drop technique at all. Each of these alternative methods has its own specific applications, but they do not utilize the dynamic impact that characterizes dynamic compaction.*

## 7. What foundation type is considered the simplest and most common among builders?

- A. Spread footing**
- B. Mat foundation
- C. Floating foundation
- D. Basement foundation

*The spread footing foundation is recognized as the simplest and most common foundation type among builders for several reasons. Its primary function is to distribute the load of a structure over a large area of soil, which minimizes the pressure on any single point. This makes it particularly effective in providing stability for smaller buildings and is often used for residential construction. Spread footings consist of a thick concrete slab that is wider than the foundation wall it supports, allowing the weight to be evenly distributed. Their straightforward design and ease of construction contribute to their popularity, as they typically do not require specialized skills or equipment. Additionally, spread footings can be used on a variety of soil types, making them versatile for different building sites. In contrast, other foundation types like mat foundations, though advantageous in specific scenarios such as high load conditions or less stable soil, require more material and a greater investment in engineering design. Floating foundations are more specialized, used primarily in areas with poor soil conditions or where ground movement is a concern. Basement foundations involve additional complexity due to their depth and the need for waterproofing solutions. Thus, the widespread use and ease of implementation of spread footings solidify their status as the foundational choice for many builders.*

## 8. What are admixtures used for in concrete?

- A. To only enhance the color
- B. To improve the properties of concrete in various ways**
- C. To reduce the initial cost of materials
- D. To ensure concrete complies with building codes

*Admixtures are substances added to concrete during the mixing process to modify its properties, enhancing its performance and functionality for specific applications. These can include improving workability, increasing strength, reducing water demand, accelerating or retarding setting times, and providing resistance to harsh environmental conditions. By using admixtures, engineers can tailor the concrete mixture to meet the unique requirements of different construction projects, ensuring optimal performance and longevity. While enhancing color might be one potential use of certain admixtures, this is not their primary purpose. The reduction of initial material costs and compliance with building codes are not direct uses of admixtures either, as they primarily focus on altering the physical and chemical characteristics of the concrete rather than cost or regulatory compliance.*

**9. What type of costs does total equipment owning cost include?**

- A. Only service costs and repair costs
- B. Only depreciation and insurance costs
- C. Investment, insurance, tax, storage, and repair costs**
- D. Maintenance and labor costs only

*Total equipment owning cost encompasses a comprehensive range of expenses associated with possessing and maintaining equipment. This includes investment costs, which reflect the initial purchase price and any financing costs, along with the ongoing insurance costs required to protect the equipment against risks such as damage or loss. Additionally, taxes levied on the equipment (like property taxes) add to these costs, as well as storage expenses, which can arise if the equipment is not in constant use and needs to be stored properly. Lastly, repair costs are also included as they address the financial responsibilities related to keeping the equipment in operational condition. This combination of factors provides a complete view of the financial implications of owning equipment, making option C the correct answer, as it fully captures the various types of costs involved.*

**10. What is the finishing technique used on slabs to produce a smooth surface intended for thin finishes like tiles or paint?**

- A. Floating
- B. Troweling**
- C. Broom finishing
- D. Jointing

*Troweling is the finishing technique specifically designed to create a smooth surface on concrete slabs. This process involves using a trowel or a similar tool to refine the surface of freshly poured concrete. The objective is to eliminate any imperfections and achieve a level of smoothness that is ideal for thin finishes, such as tiles or paint. The smooth surface produced by troweling allows for better adhesion of these finishes, ensuring a sleek and professionally polished look once completed. In addition, this technique helps in achieving the necessary surface characteristics that thin finishes require for durability and aesthetics. A properly troweled surface will also aid in the prevention of moisture ingress and surface damage over time, making it a critical step in the construction process for areas that will receive additional flooring or paint. Other finishing techniques, while useful for different purposes, do not achieve the same level of smoothness or fineness as troweling. For instance, floating is typically used to initially smooth the surface – but it does not produce the fine finish required for thin coverings. Broom finishing creates texture, which is not appropriate when smoothness is the intended outcome. Jointing is mainly a method used for creating joints in concrete to control cracking, and does not influence the surface smoothness.*

## 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](mailto: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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