

Tennessee Wastewater Operator Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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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

- 1. Where are digested solids typically removed from an aerobic digester?**
 - A. From the top**
 - B. Near the bottom**
 - C. From the sides**
 - D. From the inlet**
- 2. Which type of gas released at treatment plants can lead to respiratory issues?**
 - A. Carbon dioxide**
 - B. Nitrogen dioxide**
 - C. Mercaptan**
 - D. Ozone**
- 3. What could cause settled sludge to rise back to the top of the settleometer?**
 - A. Poor sampling technique**
 - B. Denitrifying and production of nitrogen gas**
 - C. Heavy rainfall**
 - D. Excessive aeration during testing**
- 4. Which microbiological characteristic is vital for Phosphorous Accumulation during wastewater treatment?**
 - A. Ability to reduce sulfate**
 - B. Capability to denitrify**
 - C. Fermentation and luxury uptake of phosphorous**
 - D. Capacity to degrade organic matter**
- 5. What type of problem may be indicated by excessive build-up of solids in the chlorine contact chamber?**
 - A. Insufficient disinfection**
 - B. Increased pressure**
 - C. Improved filtration**
 - D. Increased flow rate**

- 6. What forms of solids are commonly removed by wastewater treatment plants?**
- A. Only organic solids**
 - B. Only inorganic solids**
 - C. Total, dissolved, suspended, organic, and inorganic**
 - D. Only total solids**
- 7. In jet aeration systems, why are no moving parts located inside the process tanks beneficial?**
- A. They allow for more efficient chemical mixing**
 - B. They lessen the risk of mechanical failure**
 - C. They improve aeration effectiveness**
 - D. They reduce energy requirements**
- 8. What is one of the primary functions of a wastewater treatment plant?**
- A. Conversion of organic materials into energy**
 - B. Enhancement of water temperature**
 - C. Removal of solids from the wastewater**
 - D. Recycling of water for agricultural use**
- 9. What is the outcome if the organic loading rate to the first stage of treatment in an RBC is excessively high?**
- A. Oxygen contraction will increase**
 - B. Oxygen contraction will decrease**
 - C. Effluent quality will improve**
 - D. Sludge production will drop**
- 10. Which filtration technique is specifically used for very small particulate removal?**
- A. Reverse osmosis**
 - B. Microfiltration**
 - C. Ultrafiltration**
 - D. Air filtration**

Answers

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

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Explanations

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1. Where are digested solids typically removed from an aerobic digester?

- A. From the top**
- B. Near the bottom**
- C. From the sides**
- D. From the inlet**

Digested solids are typically removed from near the bottom of an aerobic digester. This is because during the digestion process, the solids settle at the bottom of the digester due to gravity. The digestion process reduces organic matter and stabilizes the solids, resulting in sludge accumulation primarily at the bottom. By removing the solids from near the bottom, operators can efficiently manage the accumulation and maintain proper function within the digester. It's important to note that other removal locations, such as the top or sides, would be inefficient for this purpose since the denser, digested materials naturally settle down. Removing solids from the inlet would also not be effective, as the materials there have not yet undergone digestion. Therefore, opting to remove solids from the bottom ensures that the operation remains optimized and that the sludge is adequately processed.

2. Which type of gas released at treatment plants can lead to respiratory issues?

- A. Carbon dioxide**
- B. Nitrogen dioxide**
- C. Mercaptan**
- D. Ozone**

Mercaptan is indeed a gas that can be emitted at wastewater treatment facilities and is known for its strong odor, typically associated with rotten eggs. The presence of mercaptans in the air can lead to respiratory issues and other health problems. Exposure to mercaptans can irritate the respiratory system, causing symptoms such as coughing, difficulty breathing, and throat irritation. While carbon dioxide is a byproduct of respiration and is generally present in lower concentrations without causing immediate respiratory distress, nitrogen dioxide is a harmful gas but is more commonly associated with vehicle emissions and combustion processes rather than wastewater treatment. Ozone, although unhealthy in higher concentrations and a concern in pollution discussions, is not typically produced during wastewater treatment processes. Thus, mercaptan is the gas specifically related to treatment plants that poses a direct risk for causing respiratory issues.

3. What could cause settled sludge to rise back to the top of the settleometer?

- A. Poor sampling technique**
- B. Denitrifying and production of nitrogen gas**
- C. Heavy rainfall**
- D. Excessive aeration during testing**

The phenomenon of settled sludge rising back to the top of the settleometer can indeed be attributed to the denitrification process and the production of nitrogen gas. During denitrification, certain bacteria convert nitrates into nitrogen gas as part of their metabolism. This gas can accumulate in the sludge and create buoyancy, causing the settled particles to rise. As the gas bubbles form within the floc or mass of sludge, they can lift the solids back into suspension, counteracting the effects of gravity that would typically keep them at the bottom of the settleometer. This behavior is critical in wastewater treatment processes since it indicates the presence of biological activity and potential issues with sludge blanket stability. Poor sampling technique, heavy rainfall, and excessive aeration might impact the testing process or conditions but are less directly related to the specific phenomenon of gas production impacting the settled sludge within the context of a settleometer. Understanding the role of denitrification helps clarify the interactions occurring in wastewater systems.

4. Which microbiological characteristic is vital for Phosphorous Accumulation during wastewater treatment?

- A. Ability to reduce sulfate**
- B. Capability to denitrify**
- C. Fermentation and luxury uptake of phosphorous**
- D. Capacity to degrade organic matter**

The vital microbiological characteristic for phosphorous accumulation during wastewater treatment is the fermentation and luxury uptake of phosphorous. This process involves specific microorganisms that can take up phosphorous beyond their immediate needs—this is often termed "luxury uptake." In environments where phosphorous is intermittently available, certain bacteria have the capability to store excess phosphorous within their cells during periods of high availability. This not only allows them to thrive when conditions are favorable but also helps in the overall removal of phosphorous from the wastewater. The stored phosphorous can later be released back into the environment under conditions that favor their reproduction and function, thus lowering the phosphorous concentration in the effluent. In contrast, the other characteristics listed do play roles in wastewater treatment, such as sulfate reduction and denitrification, but they are not directly involved in the accumulation of phosphorous in the same way. The degradation of organic matter is essential for overall treatment processes, yet it does not specifically target phosphorous uptake or accumulation. Effective management of phosphorous in wastewater treatment systems hinges on the ability of microorganisms to perform fermentation processes and luxury uptake, making this characteristic crucial for achieving the desired treatment outcomes.

5. What type of problem may be indicated by excessive build-up of solids in the chlorine contact chamber?

A. Insufficient disinfection

B. Increased pressure

C. Improved filtration

D. Increased flow rate

Excessive build-up of solids in the chlorine contact chamber is a significant indicator of insufficient disinfection. The chlorine contact chamber is designed to allow proper contact time between chlorine and the wastewater in order for disinfection to take place effectively. When there is an accumulation of solids, it can hinder the chlorine's ability to effectively interact with and eliminate pathogens within the wastewater. This reduced interaction time can lead to inadequate disinfection levels and potentially allow harmful microorganisms to pass through the treatment process. The presence of excess solids could also indicate underlying issues with upstream processes, such as sedimentation or solids removal, leading to a higher concentration of particulates that affect the chamber's function. Ultimately, the primary concern is ensuring that the environment allows for sufficient contact between the chlorine and the pathogens to ensure effective disinfection — excessive solids directly compromise this essential function.

6. What forms of solids are commonly removed by wastewater treatment plants?

A. Only organic solids

B. Only inorganic solids

C. Total, dissolved, suspended, organic, and inorganic

D. Only total solids

Wastewater treatment plants are designed to effectively remove a variety of solids from wastewater to ensure that the treated effluent is safe for discharge or reuse. The correct choice encompasses all forms of solids present in wastewater, recognizing their classification into total, dissolved, suspended, organic, and inorganic phases. Total solids represent all solid materials found in wastewater, including both suspended and dissolved forms. Suspended solids are those that do not dissolve in water and can be physically removed through processes such as sedimentation or filtration. Dissolved solids, on the other hand, are microscopic and cannot be removed by simple physical methods, requiring chemical treatment or biological processes for their removal. Organic solids typically refer to materials derived from living organisms, such as plant and animal matter, while inorganic solids consist of minerals and chemicals not derived from living organisms. Both of these categories are important to address in the treatment process because they can impact water quality and aquatic life if released untreated. Effective wastewater treatment systems incorporate various processes to target all these forms of solids, thus improving effluent quality and protecting environmental health. This comprehensive approach is why the answer that includes total, dissolved, suspended, organic, and inorganic solids is the most accurate. Other options limit the scope of solids considered, neglecting the full range

7. In jet aeration systems, why are no moving parts located inside the process tanks beneficial?

- A. They allow for more efficient chemical mixing**
- B. They lessen the risk of mechanical failure**
- C. They improve aeration effectiveness**
- D. They reduce energy requirements**

The benefit of having no moving parts inside the process tanks of jet aeration systems primarily lies in the reduction of mechanical failure risks. When there are no moving components, the chances of wear and tear, breakdowns, and the need for maintenance are significantly decreased. This reliability is crucial in wastewater treatment processes, where consistent operation is necessary to ensure effective treatment and compliance with regulations. Additionally, the absence of moving parts means there are fewer mechanical parts that can become clogged or require lubrication, further enhancing the system's overall reliability. This lack of mechanical complexity simplifies operation and reduces downtime, which is vital for maintaining the efficiency of wastewater treatment systems. In contrast, while the other options may have some relevance, they do not directly relate to the primary advantage of avoiding mechanical failure, which is the key reason for favoring such designs in jet aeration systems.

8. What is one of the primary functions of a wastewater treatment plant?

- A. Conversion of organic materials into energy**
- B. Enhancement of water temperature**
- C. Removal of solids from the wastewater**
- D. Recycling of water for agricultural use**

One of the primary functions of a wastewater treatment plant is the removal of solids from the wastewater. This process is crucial because untreated wastewater contains a variety of suspended and dissolved solids, which can cause pollution and harm aquatic life if discharged into the environment. During the treatment process, large debris and solids are removed first through screening processes, followed by sedimentation, where heavier particles settle to the bottom of settling tanks. This significantly reduces the solid content in the wastewater before it undergoes further treatment, such as biological treatment, to remove dissolved organic matter and pathogens. This multi-step approach ensures that the water is treated effectively, making it suitable for discharge or potential reuse. While the conversion of organic materials into energy, enhancement of water temperature, and recycling of water for agricultural use may occur in conjunction with certain wastewater treatment processes, they are not considered primary functions of a wastewater treatment plant. The main goal consistently focuses on producing clean water by efficiently removing contaminants from wastewater.

9. What is the outcome if the organic loading rate to the first stage of treatment in an RBC is excessively high?

- A. Oxygen contraction will increase**
- B. Oxygen contraction will decrease**
- C. Effluent quality will improve**
- D. Sludge production will drop**

When the organic loading rate to the first stage of treatment in a Rotating Biological Contactor (RBC) is excessively high, the system can become overloaded with organic material. This can lead to a situation where the microorganisms present in the system are unable to adequately process the organic matter due to the sheer volume. As a result, the respiration rate of the bacteria may increase, consuming more oxygen than what is available in the system to maintain efficient biological treatment. Consequently, this can lead to a decrease in the overall oxygen concentration within the RBC because the aeration might not be sufficient to support the heightened demand for oxygen from the microorganisms. A decrease in oxygen levels can impair the aerobic treatment process, leading to suboptimal degradation of organic materials and potentially resulting in increased concentrations of pollutants in the effluent. Maintaining an appropriate organic loading rate is critical for the effective functioning of the RBC, as it ensures that microorganisms have enough oxygen to efficiently break down organic substances without overwhelming the system. In contrast, a controlled and balanced loading rate allows for optimal oxygen levels, enhancing treatment efficacy and improving the quality of the effluent produced.

10. Which filtration technique is specifically used for very small particulate removal?

- A. Reverse osmosis**
- B. Microfiltration**
- C. Ultrafiltration**
- D. Air filtration**

Reverse osmosis is specifically used for very small particulate removal, including dissolved salts and other impurities. This technique employs a semi-permeable membrane that allows water molecules to pass through while rejecting a wide range of contaminants. The high pressure applied to the feed water facilitates the movement of water through the membrane, effectively removing particles, bacteria, sugars, and ions, yielding high-quality effluent. The other filtration techniques, while effective in their respective applications, do not target particulates at the same microscopic level as reverse osmosis. Microfiltration targets larger particles and bacteria, usually in the range of 0.1 to 10 micrometers, while ultrafiltration fills the gap between microfiltration and reverse osmosis, dealing with particles in the range of 1 to 100 nanometers but not effectively removing dissolved solids. Air filtration is focused on removing particulate air contaminants and is not applicable in this context. Thus, reverse osmosis stands out as the technique specifically aimed at very small particulate removal.

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://tennessee-wastewateroperator.examzify.com>

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