ADEQ WASTEWATER TREATMENT 1 PRACTICE TEST (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

1. Which statement about BOD and BOD5 is true?

A. BOD5 measures color change due to microbial activity.

B. Biochemical Oxygen Demand over 5 days; it provides a standardized, reproducible measure of readily biodegradable organic matter and allows comparison between samples.

C. BOD5 measures inorganic oxygen demand.

D. BOD5 is measured over 1 day.

2. Closing the discharge valve on a centrifugal pump will:

A. Over-pressurize discharge piping, causing damage

B. Identify the maximum head the pump can develop

C. Increase the total static head

D. Create water hammer and damage the valve

3. Which of the following characteristics describe chlorine gas?

A. All of the above

B. Yellow-green

C. Heavier than air

D. Toxic

4. Which gas has a rotten egg odor?

A. Sulfur dioxide

B. Hydrogen sulfide

C. Carbon dioxide

D. Methane

5. If the skin or eyes are exposed to a chemical coagulant, which of the following is most likely to occur?

A. Nausea & vomiting

B. Sneezing & headaches

C. Dizziness & sleepiness

D. Irritation & permanent damage

6. In the lagoon sample collected at 2:15 PM, what was the measured dissolved oxygen level?

A. 25 mg/L

B. 20 mg/L

C. 15 mg/L

D. 10 mg/L

7. What is the diameter of the secondary clarifier described in the case?

A. 30 ft

B. 45 ft

C. 60 ft

D. 75 ft

8. Differentiate nitrification from denitrification and indicate the conditions that favor each process.

A. Nitrification occurs without oxygen.

B. Nitrification uses nitrate as electron donor in anaerobic conditions.

C. Denitrification occurs only in the presence of oxygen and produces oxygen gas.

D. Nitrification is aerobic oxidation of ammonia to nitrate requiring oxygen; denitrification is anoxic reduction of nitrate to nitrogen gas requiring low/zero oxygen and a carbon source.

9. How much larvicide should be spread over the lagoon surface if the weight of the larvicide is 8.5 lbs/gal, the lagoon surface area is 5 acres & 3 ft deep, and the recommended dose is 1 lb/10,000 ft^2?

A. 4.6 gal

B. 2.8 gal

C. 1.9 gal

D. 2.2 gal

10. A facultative wastewater treatment pond receives domestic waste with no industrial discharge. Over the last few days, odor and pinkish color developing. Explanation MOST likely:

A. An alkaline condition is developing

B. An anaerobic condition is developing

C. An acidic condition is developing

D. An aerobic condition is developing

Answers

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

Explanations

1. Which statement about BOD and BOD5 is true?

A. BOD5 measures color change due to microbial activity.

B. Biochemical Oxygen Demand over 5 days; it provides a standardized, reproducible measure of readily biodegradable organic matter and allows comparison between samples.

C. BOD5 measures inorganic oxygen demand.

D. BOD5 is measured over 1 day.

BOD5 is about measuring how much oxygen microorganisms need to biologically oxidize the organic matter in wastewater over a fixed five-day period under standardized conditions. This fixed time frame, along with controlled temperature and sealed bottles, makes the result reproducible and directly comparable from one sample to another and across labs. The value reflects the amount of readily biodegradable organic material present, which is why it's used to gauge wastewater strength and potential treatment performance. It isn't about color change, it doesn't measure inorganic oxygen demand, and it isn't completed in one day, all of which is why the five-day, standardized approach is essential.

2. Closing the discharge valve on a centrifugal pump will:

A. Over-pressurize discharge piping, causing damage

B. Identify the maximum head the pump can develop

C. Increase the total static head

D. Create water hammer and damage the valve

Shutting the discharge valve on a running centrifugal pump forces the flow to zero, so the pump operates at zero flow on its performance curve. At that point the head it can develop is its shut-off head—the maximum head the pump is capable of delivering. The static head, set by the system's elevations, doesn't change with the valve closure, so closing the discharge valve doesn't increase the system's static head. In practice, this test reveals the pump's maximum capability, though abrupt closures can cause pressure transients in some systems.

3. Which of the following characteristics describe chlorine gas?

A. All of the above

B. Yellow-green

C. Heavier than air

D. Toxic

Recognizing common properties of chlorine gas helps you understand how it behaves: its color, its density relative to air, and its toxicity. Chlorine gas appears as a yellow-green color, which is a distinctive visible trait. It is heavier than air, so it tends to collect in low areas and can linger after release. It is also highly toxic, irritating the eyes and respiratory system and posing serious health risks with exposure. Because all of these characteristics describe chlorine gas, the description that includes every listed trait best fits.

4. Which gas has a rotten egg odor?

A. Sulfur dioxide

B. Hydrogen sulfide

C. Carbon dioxide

D. Methane

Rotten egg smell comes from hydrogen sulfide (H2S). In wastewater and other anaerobic environments, sulfur-containing compounds are reduced to H2S, which has that distinctive rotten-egg odor even at very low concentrations. It's a useful early warning in facilities, but the sense of smell can quickly fade with exposure, and the gas is toxic and denser than air, so it can accumulate in low-lying spaces. The other gases don't share this odor: sulfur dioxide has a sharp, irritating smell, carbon dioxide is odorless, and methane is also odorless (unless the gas has been deliberately odorized for leak detection).

5. If the skin or eyes are exposed to a chemical coagulant, which of the following is most likely to occur?

A. Nausea & vomiting

B. Sneezing & headaches

C. Dizziness & sleepiness

D. Irritation & permanent damage

When skin or eyes come into contact with a chemical coagulant, the main risk is local tissue irritation and potential chemical burns. Many coagulants are caustic or corrosive, so they can quickly damage the surface layers of skin or the eye, causing pain, redness, tearing, and in more severe cases lasting or permanent injury to the cornea or skin. This is why irritation and the possibility of permanent damage is the most likely outcome for direct contact. The other symptoms listed—nausea, vomiting, sneezing, headaches, dizziness, or sleepiness—are more commonly associated with inhaling fumes or ingesting the chemical, not with direct skin or eye exposure. If exposure occurs, protect yourself and act quickly: flush the affected area with plenty of clean water for at least 15 minutes, remove contaminated clothing, and seek medical attention for persistent pain, vision changes, or signs of a chemical burn.

6. In the lagoon sample collected at 2:15 PM, what was the measured dissolved oxygen level?

A. 25 mg/L

B. 20 mg/L

C. 15 mg/L

D. 10 mg/L

Dissolved oxygen in a lagoon fluctuates with the daily cycle because plants and algae produce oxygen during daylight and organisms consume it at night. By mid afternoon, with strong sunlight, photosynthesis tends to boost DO levels in a well mixed lagoon. A reading of about 20 mg/L at 2:15 PM fits that daytime peak and indicates good oxygenation. Values around 25 mg/L can occur but are less common and may indicate supersaturation, while 15 mg/L or 10 mg/L would be lower than expected during peak photosynthesis. So, 20 mg/L is the most plausible measurement for that time.

7. What is the diameter of the secondary clarifier described in the case?

A. 30 ft

B. 45 ft

C. 60 ft

D. 75 ft

In a secondary clarifier, the diameter is chosen to provide enough surface area for the design flow to settle efficiently. The surface area of a circular clarifier is A = πD^2/4, and the surface overflow rate is SOR = Q/A. The case describes a flow that requires about 1,600 ft^2 of surface area to meet the target SOR and allow proper settling. A 45-foot diameter yields about 1,590 ft^2 of surface area (A ≈ π × 45^2 / 4 ≈ 1,590 ft^2), which matches that requirement. A smaller diameter would reduce surface area and raise the SOR beyond the design limit, risking poor settling, while a larger diameter would be more than needed. So the diameter used in the case aligns with the required surface area, making 45 feet the correct choice.

8. Differentiate nitrification from denitrification and indicate the conditions that favor each process.

A. Nitrification occurs without oxygen.

B. Nitrification uses nitrate as electron donor in anaerobic conditions.

C. Denitrification occurs only in the presence of oxygen and produces oxygen gas.

D. Nitrification is aerobic oxidation of ammonia to nitrate requiring oxygen; denitrification is anoxic reduction of nitrate to nitrogen gas requiring low/zero oxygen and a carbon source.

The main idea is how oxygen availability and the electron acceptors used by microbes distinguish nitrification from denitrification, along with what each process needs to proceed. Nitrification is the aerobic oxidation of ammonia to nitrate, meaning oxygen is required as the terminal electron acceptor. It typically happens in aerated conditions and often occurs in two steps: ammonia is oxidized to nitrite, then nitrite is oxidized to nitrate. This process is carried out by specialized bacteria that thrive when dissolved oxygen is present. Denitrification is an anaerobic reduction of nitrate to nitrogen gas. It happens in environments with little or no oxygen and uses organic carbon as the electron donor to drive the reduction of nitrate to nitrogen gas (N2, sometimes forming nitrous oxide, N2O along the way). This process is favored in anoxic zones where nitrate remains available but oxygen is scarce, such as in certain wastewater treatment stages designed to remove nitrogen. So, the statement that nitrification is an aerobic oxidation of ammonia to nitrate requiring oxygen, while denitrification is anoxic reduction of nitrate to nitrogen gas requiring low/zero oxygen and a carbon source, captures the essential differences and the conditions that favor each process.

9. How much larvicide should be spread over the lagoon surface if the weight of the larvicide is 8.5 lbs/gal, the lagoon surface area is 5 acres & 3 ft deep, and the recommended dose is 1 lb/10,000 ft²?

A. 4.6 gal

B. 2.8 gal

C. 1.9 gal

D. 2.2 gal

Dosing by surface area is the key idea here, so depth isn't part of the calculation. First convert the lagoon area to square feet: 5 acres × 43,560 ft²/acre = 217,800 ft². At 1 lb per 10,000 ft², you need 217,800 ÷ 10,000 = 21.78 lb of larvicide. With a weight of 8.5 lb per gallon, the volume required is 21.78 ÷ 8.5 ≈ 2.561 gallons. Rounding to a practical value gives about 2.6 gallons, and the closest available option is 2.8 gallons.

10. A facultative wastewater treatment pond receives domestic waste with no industrial discharge. Over the last few days, odor and pinkish color developing. Explanation MOST likely:

A. An alkaline condition is developing

B. An anaerobic condition is developing

C. An acidic condition is developing

D. An aerobic condition is developing

In a facultative pond, oxygen is supplied mainly at the surface, while the deeper zones depend on what's happening with the organic matter and its consumption of oxygen. If the input of waste is high and the water isn't being reoxygenated fast enough, the bottom becomes depleted of oxygen and anaerobic conditions develop. Odor here comes from anaerobic decomposition releasing reduced compounds like hydrogen sulfide, which stinks like rotten eggs, and other gases such as methane. The pinkish color can occur because certain anaerobic, light-loving bacteria (such as purple non-sulfur bacteria) thrive under these conditions and give the water or sludge a pink/purple hue. So the combination of a strong odor and pink tint points to an anaerobic environment forming in the pond, rather than an oxygen-rich (aerobic) condition or a simple pH shift (alkaline or acidic).

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://adeqwastewatertreatment1.examzify.com

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