

American Water College Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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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. What can occur if ammonia levels increase in the primary clarifier?**
 - A. Primary sludge can become septic**
 - B. Primary sludge will dissolve**
 - C. A swimming pool effect occurs**
 - D. Primary sludge remains stable**

- 2. What is the primary function of a trickling filter?**
 - A. Removal of suspended solids**
 - B. Removal of soluble BOD and CBOD**
 - C. Separation of heavy metals**
 - D. Clarification of wastewater**

- 3. What is formed when water combines with chlorine in the chlorine feed system?**
 - A. Hydrochloric acid**
 - B. Sodium chloride**
 - C. Chlorine dioxide**
 - D. Chlorinated water**

- 4. For what reasons is wastewater typically sampled?**
 - A. Only for research purposes**
 - B. For process control and regulatory compliance**
 - C. To assess staff performance**
 - D. For public awareness campaigns**

- 5. What is a key characteristic of the drive unit in a mechanical RBC?**
 - A. Higher torque**
 - B. Lower speed**
 - C. Consistent speed**
 - D. Higher maintenance**

- 6. What byproduct can indicate a severe imbalance in an anaerobic digester?**
- A. Excessive methane**
 - B. Souring of the digestate**
 - C. High levels of nitrogen**
 - D. Reduced sludge thickness**
- 7. Why are BOD samples generally not used for process control?**
- A. The samples require too much water**
 - B. The test takes a long time to complete**
 - C. They are not accurate**
 - D. They are too expensive**
- 8. How much time is typically required for a BOD test to complete?**
- A. 2 days**
 - B. 5 days**
 - C. 1 day**
 - D. 3 days**
- 9. What is the role of coagulants in wastewater treatment?**
- A. To promote bacterial growth**
 - B. To neutralize electrical charges of colloidal particles**
 - C. To enhance odor control**
 - D. To reduce temperature**
- 10. What does an increase in secondary nitrate and nitrite concentrations indicate?**
- A. Decomposition**
 - B. Nitrification**
 - C. Denitrification**
 - D. Reduction of ammonia**

Answers

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

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Explanations

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1. What can occur if ammonia levels increase in the primary clarifier?

- A. Primary sludge can become septic**
- B. Primary sludge will dissolve**
- C. A swimming pool effect occurs**
- D. Primary sludge remains stable**

When ammonia levels increase in the primary clarifier, the primary sludge can become septic. This is due to the fact that elevated ammonia can alter the biological processes occurring within the sludge. If conditions in the clarifier become anaerobic or if there is an excessive buildup of ammonia, the bacteria that would typically promote healthy microbial activity may die off or become inhibited. This results in a breakdown of organic matter under anaerobic conditions, leading to the production of gases such as hydrogen sulfide and ultimately causing the sludge to become septic, which is characterized by foul odors and reduced settleability. In contrast, the other outcomes mentioned do not accurately reflect the consequences of increased ammonia levels. For example, primary sludge does not dissolve in these conditions; instead, it becomes destabilized. The concept of a "swimming pool effect" does not apply in this context, as it is more related to physical mixing rather than biological conditions. Lastly, stable primary sludge would be indicative of healthy microbial activity, which would not be the case with rising ammonia levels leading to septic conditions. Thus, the correct choice relates directly to the biological impact of ammonia on the clarifier and its sludge.

2. What is the primary function of a trickling filter?

- A. Removal of suspended solids**
- B. Removal of soluble BOD and CBOD**
- C. Separation of heavy metals**
- D. Clarification of wastewater**

The primary function of a trickling filter is the removal of soluble biochemical oxygen demand (BOD) and carbonaceous biochemical oxygen demand (CBOD). Trickling filters serve as a type of biological treatment where wastewater is distributed over a bed of media (such as rocks or plastic) that supports microbial growth. This biofilm of microorganisms adheres to the media and metabolizes organic matter present in the wastewater. As the wastewater trickles down through the media, the microorganisms consume the organic material, leading to a reduction in BOD and CBOD levels. Efficient removal of these pollutants is crucial, as it helps prevent environmental degradation and ensures that discharged water meets regulatory standards for water quality. In contrast, other options focus on different processes not primarily associated with trickling filters. The removal of suspended solids, while sometimes aided by trickling filters, is generally more effectively accomplished by sedimentation processes. Separation of heavy metals might be more relevant to specialized treatments such as chemical precipitation or ion exchange rather than a trickling filter's biological focus. Clarification of wastewater is a separate treatment step often handled in settling tanks or clarifiers, which sediment suspended solids rather than biological breakdown.

3. What is formed when water combines with chlorine in the chlorine feed system?

- A. Hydrochloric acid**
- B. Sodium chloride**
- C. Chlorine dioxide**
- D. Chlorinated water**

When water combines with chlorine in the chlorine feed system, hydrochloric acid is formed. This reaction occurs when chlorine gas is introduced to water, resulting in a dissociation that produces both hydrochloric acid and hypochlorous acid. The overall reaction can be summarized as chlorination leading to the formation of hypochlorous acid (which is effective for disinfection) and hydrochloric acid, which can influence pH levels in the water. The other options refer to different chemical processes or reactions that do not directly relate to the scenario presented. Sodium chloride is typically produced when chlorine reacts with sodium, not just with water. Chlorine dioxide is a specific compound that can be generated through different chemical reactions involving chlorine but doesn't occur directly from chlorine and water. Chlorinated water refers to water that has been treated with chlorine for disinfection purposes, but it is not a specific product of the reaction taking place. In this context, hydrochloric acid is the accurate chemical product formed from the direct combination of water and chlorine in the feed system.

4. For what reasons is wastewater typically sampled?

- A. Only for research purposes**
- B. For process control and regulatory compliance**
- C. To assess staff performance**
- D. For public awareness campaigns**

Wastewater is typically sampled for process control and regulatory compliance because it is essential for maintaining the safety and effectiveness of wastewater treatment operations. Process control involves sampling to monitor the efficiency of treatment processes, ensuring that they are operating as intended and making adjustments as necessary. This helps in optimizing performance, reducing operational costs, and preventing environmental contamination. Regulatory compliance is another critical reason for sampling wastewater. Regulatory agencies establish strict guidelines and standards for the discharge of treated wastewater into the environment. Sampling allows facilities to demonstrate adherence to these regulations, ensuring that the treated water meets safety and quality standards. Failing to comply can lead to legal penalties and damage to public health and the environment. While other options suggest valid actions or considerations, they do not encompass the fundamental reasons for routine wastewater sampling as comprehensively as process control and regulatory compliance do. Research purposes, assessing staff performance, or public awareness campaigns may involve some sampling but are not the primary reasons that drive the core operational practices in wastewater management.

5. What is a key characteristic of the drive unit in a mechanical RBC?

- A. Higher torque**
- B. Lower speed**
- C. Consistent speed**
- D. Higher maintenance**

The key characteristic of the drive unit in a mechanical Rotating Biological Contactor (RBC) is consistent speed. This consistency in speed is crucial because it ensures that the media, where microorganisms facilitate the treatment process, rotate uniformly. When the speed is consistent, it allows for optimal contact between the wastewater and the biofilm on the media surface, enhancing the system's efficiency in biological treatment. Maintaining a steady speed is essential for ensuring that the treatment process is reliable and effective. Variations in speed could lead to uneven distribution of the biofilm, potential shear stress on the microorganisms, and ultimately, a decreased level of treatment. Consistent operation also aids in the predictable maintenance of the RBC system, making management and troubleshooting more straightforward. While factors such as maintenance and torque are relevant to the overall functionality of a RBC, the primary focus on consistent speed highlights the importance of operational stability for achieving successful wastewater treatment through biological processes.

6. What byproduct can indicate a severe imbalance in an anaerobic digester?

- A. Excessive methane**
- B. Souring of the digestate**
- C. High levels of nitrogen**
- D. Reduced sludge thickness**

Souring of the digestate is an important indicator of a severe imbalance within an anaerobic digester. This condition typically occurs when there is an overproduction of volatile fatty acids (VFAs) relative to their consumption by methanogenic microorganisms. In a well-balanced anaerobic digestion process, the production and consumption of VFAs should be closely aligned, resulting in a stable pH level and optimal conditions for methane production. When souring occurs, the pH of the digestate decreases significantly, often falling below the ideal range for microbial activity. This acidification can inhibit the activity of methanogens, which are crucial for converting organic materials into methane, thus leading to less efficient digestion and potentially even process failure. The presence of excessive methane, high levels of nitrogen, or reduced sludge thickness could be indicators of other issues but do not specifically point to the same severe imbalance associated with souring. Souring specifically highlights a disruption in the natural balance of the microbial community, which is essential for the effective functioning of an anaerobic digester.

7. Why are BOD samples generally not used for process control?

- A. The samples require too much water**
- B. The test takes a long time to complete**
- C. They are not accurate**
- D. They are too expensive**

BOD, or Biochemical Oxygen Demand, measures the amount of oxygen that microorganisms will consume while decomposing organic matter in water. One of the key reasons BOD samples are generally not used for process control in treatment plants is that the test takes a long time to complete, typically five days. This delay in obtaining results makes it impractical for real-time adjustments in the treatment processes, which require immediate feedback to effectively manage operations. In contrast, other methods for monitoring water quality or organic load, such as COD (Chemical Oxygen Demand) or online sensors, can provide quicker results, allowing for timely process adjustments. The lengthy BOD testing period limits its application in scenarios where rapid intervention is crucial for maintaining optimal operational conditions.

8. How much time is typically required for a BOD test to complete?

- A. 2 days**
- B. 5 days**
- C. 1 day**
- D. 3 days**

The typical duration required for a Biochemical Oxygen Demand (BOD) test to complete is five days. This standard time frame is established to allow for the accurate measurement of the oxygen consumed by microorganisms as they decompose organic material in a water sample. During this period, the sample is incubated at a controlled temperature of 20°C (68°F), which is the ideal condition for microbial activity. The five-day requirement ensures that the data reflects the oxygen demand over a period that accurately represents the organic load, which is critical for assessing water quality and the impact on aquatic life. A shorter time frame, such as one or two days, would not provide a thorough understanding of the oxygen demand, as the microbial breakdown of organic matter would not have had adequate time to occur. In summary, five days is essential for obtaining reliable and meaningful results in BOD testing.

9. What is the role of coagulants in wastewater treatment?

- A. To promote bacterial growth
- B. To neutralize electrical charges of colloidal particles**
- C. To enhance odor control
- D. To reduce temperature

Coagulants play a crucial role in the wastewater treatment process by neutralizing the electrical charges of colloidal particles present in the water. These colloidal particles are typically small and negatively charged, which prevents them from aggregating and settling out of the water. When coagulants, such as aluminum sulfate or ferric chloride, are added to the wastewater, they interact with these negatively charged particles. The coagulants neutralize their charges, allowing the particles to come together and form larger aggregates or flocs. This process enhances the efficiency of subsequent treatment steps, such as sedimentation and filtration, as the larger flocs can be more easily removed from the water, leading to clearer effluent. The use of coagulants is fundamental in ensuring that harmful pollutants and suspended solids are effectively extracted from wastewater before it is released into the environment or further processed.

10. What does an increase in secondary nitrate and nitrite concentrations indicate?

- A. Decomposition
- B. Nitrification**
- C. Denitrification
- D. Reduction of ammonia

An increase in secondary nitrate and nitrite concentrations indicates nitrification, which is a crucial process in the nitrogen cycle. Nitrification is the biological oxidation of ammonia into nitrite followed by the oxidation of nitrite into nitrate, typically carried out by specific bacteria in aerobic conditions. During this process, ammonia is converted to nitrite (NO_2^-) and subsequently to nitrate (NO_3^-), resulting in higher concentrations of these intermediary compounds when nitrification is active. This not only influences nitrogen availability in ecosystems but also is critical for managing water quality in treatment plants, where monitoring these levels helps in understanding the efficiency of the nitrification process. In contrast, while decomposition involves the breakdown of organic matter and can produce ammonia, it does not directly lead to increased nitrate and nitrite levels. Denitrification, on the other hand, is a different process that reduces nitrate and nitrite to nitrogen gas, thus decreasing their concentrations rather than increasing them. The reduction of ammonia primarily refers to its conversion to other nitrogenous compounds but does not specifically indicate an accumulation of nitrate and nitrite. Therefore, the presence of increased secondary nitrate and nitrite concentrations is a clear signal of active nitrification.

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://americanwatercollege.examzify.com>

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

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