Physical Chemical Waste Water Grade 1 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. Three separate methods of solids removal from a physical chemical industrial process are:

A. Screenings

B. Settling

C. Filtration

D. Screenings, Settling, and Filtration

2. An advantage of gravity settling over pressure flotation is that it requires less what?

A. Lower energy

B. Less equipment

C. Faster operation

D. Easier maintenance

3. Where should the smallest particles be expected to settle within the average detention time in a sedimentation tank?

A. Far end

B. Near end

C. Middle

D. Top

4. Which material is cited as a suitable medium for coalescing oil droplets?

A. Aluminum

B. Teflon

C. Glass

D. Wood

5. Total discharge head includes which type of head?

A. static discharge head

B. velocity head

C. suction head

D. atmospheric head

6. During regeneration, oxygen concentration is kept at what level to prevent burning?

A. 2% to 4%

B. 5% or more

C. 1% or less

D. 0%

7. If a pump's flexible coupling is very noisy at startup, which issue could be the cause?

A. Misalignment

B. Improper clearance

C. Improper adjustment

D. Damaged shaft

8. Which of the following is NOT considered a problem in the textile industry?

A. Color pollution

B. Cyanide

C. Biochemical Oxygen Demand (BOD)

D. Total Suspended Solids (TSS)

9. A ___ _____ _____ provides power with each revolution of the crankshaft.

A. Four stroke engine

B. Two cycle engine

C. Diesel engine

D. Gas turbine

10. Which item is listed as not part of a hazard communication program?

A. Lockout/tagout

B. PPE training

C. Hazard communication training

D. Written safety data sheets

Answers

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

Explanations

1. Three separate methods of solids removal from a physical chemical industrial process are:

A. Screenings

B. Settling

C. Filtration

D. Screenings, Settling, and Filtration

Solid removal in physical-chemical processes is best achieved with a staged approach that handles different particle sizes. Large solids are best removed first with screening, which protects pumps and downstream equipment from clogs and damage. After that, gravity-based settling (clarification) removes a substantial portion of the suspended solids by letting them settle to the bottom of a tank, reducing turbidity and the solid load. Finally, filtration acts as a polishing step, catching the finer particles that escape the screen and the settler to produce a clearer effluent and protect downstream processes. When a system uses all three steps—screening, settling, and filtration—it can effectively remove a broad range of solids, from large debris to very fine particles, which is why that combined approach is the best fit. Relying on any single method would miss solids outside that method's effective range, leaving potential problems downstream.

2. An advantage of gravity settling over pressure flotation is that it requires less what?

A. Lower energy

B. Less equipment

C. Faster operation

D. Easier maintenance

Gravity settling works by letting dense particles gradually fall out of suspension under the pull of gravity in a clarifier, so the system relies on relatively simple, stationary hardware. Because there's no need to generate air bubbles, mix vigorously, or circulate large volumes with specialized flotation equipment, the overall equipment footprint is smaller. In contrast, pressure flotation requires additional components such as an air supply system, diffusers or flotation cells, mixers, chemical dosing equipment, skimmers, and related controls. That combination adds to capital cost and maintenance needs. So the clear advantage is needing less equipment. Other aspects like energy use, speed, or maintenance aren't as universally simplified and depend on specific designs, making equipment count the strongest differentiator.

3. Where should the smallest particles be expected to settle within the average detention time in a sedimentation tank?

A. Far end

B. Near end

C. Middle

D. Top

In a sedimentation tank, how fast a particle settles depends on its size and density—its settling velocity. With a fixed average detention time, the larger, heavier particles have enough time to reach the bottom early in the flow path, while the smallest, slowest-settling particles need more time. As water moves toward the outlet, these tiny particles continue to settle only slowly, so within the given detention time they are most likely to settle toward the far end of the tank (the outlet side). In other words, the smallest particles are expected to be found settling at the far end because they require the extra time to overcome their low settling velocity.

4. Which material is cited as a suitable medium for coalescing oil droplets?

A. Aluminum

B. Teflon

C. Glass

D. Wood

Coalescing oil droplets work best on surfaces that don't wet easily and don't strongly hold onto the droplets. A low-energy, non-stick material like Teflon (PTFE) provides a very smooth, non-wetting surface, so oil droplets can move together, meet, and merge into larger droplets rather than sticking individually to the surface. This promotes efficient coalescence and separation. In contrast, materials with higher surface energy or rough textures—like aluminum, glass, or wood—tend to cause droplets to cling or pin, or trap oil within pores, which hinders the droplets from coming together and coalescing as readily.

5. Total discharge head includes which type of head?

A. static discharge head

B. velocity head

C. suction head

D. atmospheric head

Total discharge head represents the energy needed to raise the water to the discharge point, which is captured by the static discharge head. This is the elevation component of the head on the discharge side—the height the water must be lifted. The velocity of the water contributes a separate energy term (velocity head) used for calculating exit speed and flow rate, not part of the discharge head itself. Suction head relates to the suction side conditions, and atmospheric head is the ambient pressure, which is typically accounted for differently in gauge-head calculations. So, the discharge head is governed by the static discharge head.

6. During regeneration, oxygen concentration is kept at what level to prevent burning?

A. 2% to 4%

B. 5% or more

C. 1% or less

D. 0%

Keeping oxygen very low during regeneration is about preventing any ignition of combustible materials that may be released or exposed as the process heats or reactivates the material. Oxygen fuels combustion, so creating an inert-like environment by limiting O2 to about 1% or less minimizes the risk of burning. While zero percent O2 would be ideal, in practice small leaks keep a tiny amount present, and 1% or less is the practical, safe threshold used. Higher oxygen levels, even a few percent, can create a flammable or explosive mix depending on temperatures and vapors involved, so they're avoided during regeneration.

7. If a pump's flexible coupling is very noisy at startup, which issue could be the cause?

A. Misalignment

B. Improper clearance

C. Improper adjustment

D. Damaged shaft

Misalignment between the motor and pump shafts is what usually causes a loud startup in a pump with a flexible coupling. Flexible couplings are built to accommodate small deviations, but when shafts aren't in proper line, the coupling has to bend as torque is applied. That sudden bending and the resulting uneven loading on the shaft and bearings can cause the coupling elements to rub, bind, or strike as it engages, producing a noticeable clatter or squeal at start. Improper clearance would show up as too much or too little space in the connection, leading to either play or binding effects that aren't specifically tied to startup noise. Improper adjustment can create pre-load issues, but the characteristic startup noise tied to torque engagement is more a sign of misalignment. A damaged shaft would typically bring more obvious symptoms like excessive vibration, wobble, or failure signs beyond just noisy startup.

8. Which of the following is NOT considered a problem in the textile industry?

A. Color pollution

B. Cyanide

C. Biochemical Oxygen Demand (BOD)

D. Total Suspended Solids (TSS)

The main idea is recognizing which pollutants are typically associated with textile wastewater. In textile operations, color pollution from dyes is a major concern because dyed effluent can discolor water and affect aquatic life; Biochemical Oxygen Demand reflects the large amount of biodegradable organic matter from dyes, detergents, and finishing agents, signaling how much oxygen will be consumed as wastewater decomposes; Total Suspended Solids come from fibers, fillers, and other solids that remain suspended and can cause turbidity and sludge problems. Cyanide, on the other hand, is not a common constituent of textile effluent and is more characteristic of industries like metal finishing or mining, where cyanide-containing processes are used. Because of that, cyanide is not considered a typical textile industry problem, making it the best choice for what is NOT a standard issue in textile wastewater.

9. A ___ _____ _____ provides power with each revolution of the crankshaft.

A. Four stroke engine

B. Two cycle engine

C. Diesel engine

D. Gas turbine

The thing being tested is how often a power stroke occurs relative to crankshaft rotation. In a two-stroke engine, the full cycle—intake, compression, power, and exhaust—finishes in one revolution of the crankshaft, so a power stroke happens with every turn. That means power is produced on each revolution. In contrast, a four-stroke engine needs two crankshaft revolutions to complete the cycle, so the power stroke occurs only every other revolution. Diesel engines are usually four-stroke, and gas turbines don't use a crankshaft-based cycle in the same way. So the option that yields power with every crankshaft revolution is the two-stroke engine.

10. Which item is listed as not part of a hazard communication program?

A. Lockout/tagout

B. PPE training

C. Hazard communication training

D. Written safety data sheets

Hazard communication programs focus on conveying chemical hazards to workers—keeping a written plan, maintaining labels and warnings, providing safety data sheets, and training employees on chemical hazards and protective measures like the proper use of PPE. Lockout/tagout is about isolating energy sources to prevent equipment from starting during maintenance, which belongs to an energy-control program, not hazard communication. That's why lockout/tagout is the item not part of a hazard communication program. Written safety data sheets are a core element of hazard communication, and PPE training is typically included as part of hazard communication training to ensure workers know how to protect themselves when handling chemicals.

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://physicalchem1wastewater.examzify.com

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