

CITY OF CHICAGO BOILER PRACTICE EXAM (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

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- 1. An economizer is used in large boiler plants to heat which part of the feedwater?**
 - A. Feedwater Using Gases of Combustion
 - B. Feedwater Using Steam
 - C. Combustion Air
 - D. Condensate Return Water
- 2. If the water temperature in the open feedwater heater is too high, what condition could develop?**
 - A. The feedwater pump to become steambound
 - B. The heater overheats and protection triggers
 - C. The feedwater has reduced cavitation risk
 - D. The heater efficiency improves
- 3. A safety valve will ____.**
 - A. Prevent the boiler from exceeding its MAWP
 - B. Regulate boiler temperature
 - C. Increase pressure
 - D. Pop open
- 4. Why is proper venting important in combustion systems?**
 - A. It has no impact on efficiency.
 - B. It prevents water leaks.
 - C. It controls electrical supply.
 - D. It helps achieve balanced air supply and safe operation, contributing to combustion efficiency.
- 5. Which fuel oil grade must be heated before pumping?**
 - A. No. 6
 - B. No. 2
 - C. No. 4
 - D. No. 1

- 6. Define feedwater flash steam and its effect on energy balance.**
- A. It increases energy efficiency
 - B. It has no effect on energy balance
 - C. When hot feedwater enters under pressure, some water flashes to steam, causing energy loss unless captured or recovered
 - D. It reduces energy loss
- 7. Why is soot removal important for boiler efficiency?**
- A. To reduce emissions
 - B. To prevent corrosion
 - C. To improve heat transfer
 - D. To increase fuel efficiency
- 8. What is the purpose of a gauge glass and water column?**
- A. Provide a visible water level indication for safe boiler operation.
 - B. Measure steam temperature.
 - C. Regulate fuel pressure.
 - D. Display boiler efficiency.
- 9. Which of the following is true when the open feedwater heater temperature is too low?**
- A. Oxygen pitting in the boiler
 - B. The feedwater pump to become steambound
 - C. The discharge valve seals fail
 - D. There is no impact on boiler safety
- 10. Which factor is commonly monitored to control cycles of concentration in boiler water management?**
- A. Boiler pressure
 - B. Conductivity
 - C. Oxygen content
 - D. Temperature

Answers

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

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Explanations

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1. An economizer is used in large boiler plants to heat which part of the feedwater?

A. Feedwater Using Gases of Combustion

B. Feedwater Using Steam

C. Combustion Air

D. Condensate Return Water

An economizer uses the heat in hot exhaust (combustion) gases to preheat the feedwater before it enters the boiler. This recovered heat boosts overall plant efficiency by reducing the energy the boiler must supply to turn water into steam, and it also lowers fuel consumption and thermal stress on the boiler. Heating feedwater with steam would require a separate steam-driven feedwater heater, not an economizer. Combustion air is heated in an air preheater, not in the economizer. The role of the economizer is specifically to transfer heat from the exhaust gases to the feedwater.

2. If the water temperature in the open feedwater heater is too high, what condition could develop?

A. The feedwater pump to become steambound

B. The heater overheats and protection triggers

C. The feedwater has reduced cavitation risk

D. The heater efficiency improves

Open feedwater heaters rely on heated water to preheat the feedwater before it enters the boiler. If the water coming from the heater is too hot, its vapor pressure is high enough that, once the water is drawn into the feedwater pump, any pressure drop on the suction side can cause some of the water to flash into steam. That steam forms a pocket in the pump suction, filling it with vapor and preventing the pump from lifting liquid – a condition known as steambound. When the pump is steambound, it loses prime and can't deliver the required feedwater to the boiler, risking boiler operation. Note that higher temperature does not reduce cavitation risk; it typically increases it because vapor pressure is higher. Also, while overheating protection may trip, the immediate pump-related effect of water being too hot is steambound, not an improvement in efficiency.

3. A safety valve will ____.

A. Prevent the boiler from exceeding its MAWP

B. Regulate boiler temperature

C. Increase pressure

D. Pop open

The essential idea is that a safety valve relieves pressure by opening to vent steam. It is designed to lift at a set pressure so that steam can escape and prevent the boiler from going over its maximum allowable working pressure. The immediate action you observe is the valve popping open, releasing steam, and then reseating once pressure drops. It isn't meant to regulate temperature or to increase pressure, and while it prevents reaching the MAWP, the specific, observable function is to pop open.

4. Why is proper venting important in combustion systems?

- A. It has no impact on efficiency.
- B. It prevents water leaks.
- C. It controls electrical supply.
- D. It helps achieve balanced air supply and safe operation, contributing to combustion efficiency.**

Proper venting provides the path for both bringing in the right amount of air and removing combustion exhaust safely. When venting is correct, the system draws balanced air for efficient, complete combustion and channels away hot gases and potential pollutants. This balance helps maximize fuel use, reduce wasted fuel, and prevent dangerous backdrafts or the buildup of CO inside the space. If venting is inadequate, exhaust can reflux into the building, combustion can become incomplete, and harmful gases can accumulate, threatening safety and efficiency. Water leaks, on the other hand, aren't caused by venting, and venting doesn't control electrical supply, so those points don't apply.

5. Which fuel oil grade must be heated before pumping?

- A. No. 6**
- B. No. 2
- C. No. 4
- D. No. 1

Heavy fuel oils are very viscous, especially in cold conditions. The heaviest grade contains more waxy content and higher molecular weight, so at room temperature it can be thick enough to resist being pushed through pumps, lines, and filters. Heating is used to lower that viscosity so the fuel can flow smoothly and be delivered to the burner with reliable atomization. If it isn't heated, the pump can struggle, filters can clog, and combustion may become unstable. Lighter fuel oils flow much more readily at normal temperatures, so they typically don't require heating just to pump. Heating them is not usually necessary unless the temperature is so low that they begin to thicken, which is less common for these grades. So, the essential idea is that the heaviest grade must be heated before pumping to ensure it can be pumped, filtered, and atomized properly for reliable boiler operation.

6. Define feedwater flash steam and its effect on energy balance.

- A. It increases energy efficiency
- B. It has no effect on energy balance
- C. When hot feedwater enters under pressure, some water flashes to steam, causing energy loss unless captured or recovered**
- D. It reduces energy loss

When hot feedwater at high pressure is introduced into a boiler that's at a lower pressure, some of the water cannot remain liquid and flashes to steam. This happens because the saturation temperature corresponding to the boiler pressure is lower than the incoming water's temperature, so part of it vaporizes to reach equilibrium. The latent heat carried away by that flash steam reduces the energy content of the feedwater entering the boiler, effectively wasting energy in the energy balance unless the flash steam is captured or recovered. If the plant captures it—such as in a flash tank or by using it to preheat other streams or drive a small turbine—that energy is reused, improving the overall energy balance and efficiency.

7. Why is soot removal important for boiler efficiency?

- A. To reduce emissions
- B. To prevent corrosion
- C. To improve heat transfer**
- D. To increase fuel efficiency

Soot removal matters because soot on heat transfer surfaces acts as insulation, slowing the transfer of heat from the hot combustion gases to the boiler water. When that heat transfer is hindered, you must burn more fuel to meet the same steam output, so boiler efficiency drops. Keeping the surfaces clean restores efficient heat transfer, which means you use less fuel to achieve the desired steam conditions and overall efficiency improves. While cleaner operation can have secondary benefits, like reducing the tendency for wall overheating or drift in combustion, the primary reason soot removal boosts efficiency is the direct improvement in heat transfer.

8. What is the purpose of a gauge glass and water column?

- A. Provide a visible water level indication for safe boiler operation.**
- B. Measure steam temperature.
- C. Regulate fuel pressure.
- D. Display boiler efficiency.

Gauge glass and water column are used to provide a direct, visible indication of the boiler's water level. Keeping the water level within safe bounds is crucial because too little water allows the heating surfaces to overheat and can lead to tube failure or a dangerous boiler upset, while too much water can cause carryover and inefficiency. The gauge glass is a transparent tube connected to the boiler that shows the actual water level, and the water column serves as a vertical sight tube with a scale so the operator can read the level clearly. By showing the exact level, they help the operator maintain the water within the marked high and low limits during operation. They aren't used to measure steam temperature, regulate fuel pressure, or display boiler efficiency; those functions are served by other instruments and controls.

9. Which of the following is true when the open feedwater heater temperature is too low?

- A. Oxygen pitting in the boiler**
- B. The feedwater pump to become steambound
- C. The discharge valve seals fail
- D. There is no impact on boiler safety

When the open feedwater heater outlet is too cool, the feedwater entering the boiler still carries dissolved gases, especially oxygen, because heating and deaeration are not sufficient to drive them off. Oxygen in boiler water promotes corrosion, and at this condition it tends to cause oxygen pitting—a localized, aggressive form of corrosion that can initiate leaks in boiler metal. So the key effect is oxygen pitting in the boiler. The other options don't follow from a too-low OFWH temperature: a feedwater pump becoming steambound isn't a direct consequence of insufficiently heated feedwater, discharge valve seals aren't primarily affected by this temperature issue, and saying there's no impact on boiler safety ignores the corrosion risk posed by dissolved oxygen.

10. Which factor is commonly monitored to control cycles of concentration in boiler water management?

- A. Boiler pressure
- B. Conductivity**
- C. Oxygen content
- D. Temperature

Monitoring cycles of concentration is all about tracking how much dissolved solids are in the boiler water. As boiler water is boiled off and only the water vapor leaves, minerals stay behind and become more concentrated. To keep this from causing scale and corrosion, operators blow down a portion of the concentrated water to reduce solids. Conductivity is the best way to control this because it directly reflects the total ionic content of the water. When dissolved solids rise, conductivity rises; when you blow down to remove concentrated water, conductivity falls. By keeping conductivity at a target range, you effectively control the cycles of concentration. The other factors—boiler pressure, oxygen content, and temperature—are important for other reasons (like corrosion control, heat transfer, and steam conditions), but they don't provide a reliable, direct measure of how concentrated the dissolved solids are in the boiler water.

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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://chicagoboiler.examzify.com>

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

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