

STATIONARY GRADE 3 ENGINEERING LICENSE PRACTICE TEST (SAMPLE)

STUDY GUIDE



**SAMPLE STUDY GUIDE
WITH LIMITED QUESTIONS**

**VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE**

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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 is an Orsat Apparatus used for?

- A. A device for measuring the moisture content of fuel
- B. A device for measuring the combustion gas composition (CO, CO₂, O₂)
- C. A thermometer for high-temperature gases
- D. A device for sampling condensate in the steam line

2. Which statement about insulators is true?

- A. They conduct current easily
- B. They completely block all current
- C. They do not conduct electricity well under normal conditions but may conduct under high voltages
- D. They generate power

3. Which expression correctly represents Ohm's Law for current?

- A. $I = V / R$
- B. $V = I * R$
- C. $R = V / I$
- D. $I = R * V$

4. Where is an inverted bucket trap used most?

- A. Heat Exchanger
- B. Drip Legs
- C. Steam Radiators
- D. Before Pressure Reducing Valves

5. What is boiler heating surface?

- A. Any area that has hot gases on one side and boiler water on the other; measured from the fire side.
- B. The exterior surface area of the boiler.
- C. The interior volume of the combustion chamber.
- D. The cross-sectional area of the boiler tubes.

6. What is a gusset stay?

- A. A round rod.
- B. A boilerplate riveted to the shell and head or tube sheet by means of angle iron; more rigid.
- C. A through bolt used to brace flat surfaces.
- D. A diagonal stay.

7. In a three-pipe steam system, what are the three pipes used for?

- A. Steam supply, gravity condensate return, vacuum condensate return
- B. Steam supply, condensate line, feed water line
- C. Hot water line, return line, vent line
- D. Oxygen line, fuel line, air line

8. What is the purpose of doing rounds in boiler operation?

- A. To train new staff
- B. To find and correct problems to prevent breakdowns
- C. To improve boiler aesthetics
- D. To reduce downtime through scheduled maintenance

9. Which of the following is a common safeguard used with electrical equipment?

- A. Circuit breakers
- B. Scraping the insulation
- C. Using bare wires
- D. Leaving equipment unprotected

10. After cutting power to the area when a panel catches fire, what is the next action?

- A. Open doors
- B. Return to work
- C. Call 911
- D. Put water on it

Answers

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

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Explanations

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1. What is an Orsat Apparatus used for?

- A. A device for measuring the moisture content of fuel
- B. A device for measuring the combustion gas composition (CO, CO₂, O₂)**
- C. A thermometer for high-temperature gases
- D. A device for sampling condensate in the steam line

The main idea is analyzing the composition of combustion gases. An Orsat apparatus takes a sample of flue gas and runs it through a series of absorbers that selectively remove specific components. One absorber captures carbon dioxide, another captures oxygen, and a third captures carbon monoxide. By measuring how much gas is removed by each absorber, you determine the amounts of CO₂, O₂, and CO in the original gas sample. The remaining gas is mostly nitrogen, and from these absorbed volumes you can calculate the gas composition on a dry basis. This method is used to assess how completely and efficiently a furnace or boiler is burning fuel. It's not used for measuring moisture in fuel, acting as a high temp thermometer, or sampling condensates in steam lines.

2. Which statement about insulators is true?

- A. They conduct current easily
- B. They completely block all current
- C. They do not conduct electricity well under normal conditions but may conduct under high voltages**
- D. They generate power

Insulators resist electrical current. They have high resistance, so under normal operating voltages they block or greatly limit current flow. The important nuance is that this blocking isn't absolute—there can still be a small leakage current, and if the voltage becomes large enough, the material can break down and start conducting, sometimes violently (as in arcing). This is why insulators are rated for a specific working voltage and designed to withstand the expected electric field without failing. They also do not generate power; their role is to prevent current from flowing where it shouldn't. So the true statement is that insulators do not conduct electricity well under normal conditions but may conduct under high voltages.

3. Which expression correctly represents Ohm's Law for current?

- A. $I = V / R$**
- B. $V = I * R$
- C. $R = V / I$
- D. $I = R * V$

Current is how much charge passes through a conductor per second, and Ohm's Law relates this to voltage and resistance with $V = IR$. To isolate current, solve for I by dividing both sides by R , giving $I = V / R$. This form shows that doubling the voltage with the same resistance doubles the current, while doubling the resistance with the same voltage halves the current. For example, with 12 volts across a 4 ohm resistor, the current is $12 / 4 = 3$ amperes. The other forms, such as $V = IR$ or $R = V / I$, describe voltage or resistance rather than current, and $I = R * V$ isn't a valid rearrangement of the relationship.

4. Where is an inverted bucket trap used most?

- A. Heat Exchanger
- B. Drip Legs
- C. Steam Radiators**
- D. Before Pressure Reducing Valves

Removing condensate from steam heating circuits while keeping steam from escaping is the key idea here. An inverted bucket trap does this by using a simple float mechanism: the bucket sits inverted over the trap valve, and as condensate collects, the bucket rises with the water level and opens the discharge path to drain the condensate. When steam is present in the line, the steam pressure pushes the bucket down, closing the valve and preventing steam from escaping. This makes the trap perfectly suited to steam radiators, which operate at relatively low pressures and generate condensate intermittently. The design is robust, low-maintenance, and doesn't require power or extra controls, which is why it's commonly used on radiator circuits.

5. What is boiler heating surface?

- A. Any area that has hot gases on one side and boiler water on the other; measured from the fire side.**
- B. The exterior surface area of the boiler.
- C. The interior volume of the combustion chamber.
- D. The cross-sectional area of the boiler tubes.

Heating surface is the metal area in the boiler that is exposed to hot combustion gases and transfers heat to the boiler water or steam. It's measured from the fire side because that's where the heat actually enters the metal and must be quantified for heat transfer capacity. This includes the walls of the furnace and all wetted surfaces like tubes and other internal parts that are in contact with water while being heated by the flames. The exterior shell, if insulated, isn't part of the heating surface; the interior volume is just space, not a heat-transfer surface; and a single tube cross-section is only a small portion of the total area. So the best description is any area with hot gases on one side and boiler water on the other, measured from the fire side.

6. What is a gusset stay?

- A. A round rod.
- B. A boilerplate riveted to the shell and head or tube sheet by means of angle iron; more rigid.**
- C. A through bolt used to brace flat surfaces.
- D. A diagonal stay.

A gusset stay is a stiffening piece used in boiler construction to reinforce the connection between the shell and the end plates or tube sheet. It uses a gusset plate of boilerplate that is riveted to the shell and to the head or tube sheet, and the connection is made more rigid with angle iron. This setup distributes the load and resists bending, making the joint stronger than a simple stay. That's why the description emphasizing a riveted boilerplate plus angle iron to create rigidity matches a gusset stay. A round rod would provide only a basic bracing without the gusset reinforcement; a through bolt to brace flat surfaces is a different fastening method; and a diagonal stay is a different type of support without the gusset plate and riveted reinforcement.

7. In a three-pipe steam system, what are the three pipes used for?

- A. Steam supply, gravity condensate return, vacuum condensate return**
- B. Steam supply, condensate line, feed water line
- C. Hot water line, return line, vent line
- D. Oxygen line, fuel line, air line

Condensate management in a steam system is the key idea here. In a three-pipe setup you have three separate lines: one carries the live steam from the boiler to the radiators, and two handle the condensate that forms as steam gives up its heat. The gravity condensate return moves condensate back to the boiler by gravity, using the natural downward flow to reclaim heat and keep the steam lines clear. The vacuum condensate return provides another path that uses a controlled vacuum to pull condensate back toward the boiler, which helps when the run is long or elevated and gravity alone isn't enough. This arrangement keeps the system circulating efficiently, minimizes trapping of condensate, and maintains proper steam pressure.

8. What is the purpose of doing rounds in boiler operation?

- A. To train new staff
- B. To find and correct problems to prevent breakdowns**
- C. To improve boiler aesthetics
- D. To reduce downtime through scheduled maintenance

Rounds are a routine, proactive check of the boiler while it's in operation. The goal is to spot abnormal conditions—like changes in water level, pressure, flame quality, fuel supply, leaks, or faulty safety devices—before they become failures. By identifying and correcting these issues early, operators prevent unexpected breakdowns, keep the boiler running safely, and maintain efficient performance. While rounds can help with training or support maintenance planning, the main purpose is to find problems and fix them to avoid outages.

9. Which of the following is a common safeguard used with electrical equipment?

- A. Circuit breakers
- B. Scraping the insulation
- C. Using bare wires
- D. Leaving equipment unprotected**

A common safeguard is a circuit breaker, which works by automatically stopping the flow of electricity if something goes wrong. It keeps people safe and protects equipment by sensing an overload or a fault (like a short circuit) and quickly opening the circuit to prevent overheating and fires. Once the issue is fixed, the breaker can be reset and power restored. Other options are dangerous and do not provide automatic protection. Scraping insulation damages the protective layer, increasing the risk of shock or short circuits. Using bare wires leaves live conductors exposed, which is a direct shock and fire hazard. Leaving equipment unprotected offers no barrier or automatic shutoff, making accidents and damage more likely.

10. After cutting power to the area when a panel catches fire, what is the next action?

- A. Open doors
- B. Return to work
- C. Call 911**
- D. Put water on it

After turning off the power, the next action is to call emergency services right away. Electrical fires can be dangerous even when the power is cut because remaining energized equipment, hidden wiring, and heat buildup can cause the fire to spread or re-ignite. Trained firefighters have the gear and techniques to handle electrical fires safely and can coordinate shutting off any remaining power at the system, evacuate people, and control the scene. Opening doors or returning to work could feed the fire or expose others to danger, and using water on an electrical fire can cause electric shock. Calling 911 gets professionals on scene quickly to manage the hazard and protect everyone.

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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://stationarygr3engineering.examzify.com>

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

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