

FDNY Operating Engineer 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

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 refrigerant is commonly used in residential air conditioning systems?**
 - A. R-12**
 - B. R-22**
 - C. R-134a**
 - D. R-410A**
- 2. If the ball float of a low side float metering device sinks, what will happen to the suction pressure?**
 - A. The suction pressure will fall**
 - B. The suction pressure will remain the same**
 - C. The suction pressure will rise**
 - D. The system will shut down**
- 3. What effect does a high-pressure drop in a refrigeration system typically have?**
 - A. It enhances cooling efficiency**
 - B. It may lead to compressor failure**
 - C. It stabilizes system temperature**
 - D. It decreases the workload on the evaporator**
- 4. What is the latent heat of fusion for water in BTUs?**
 - A. 80 BTUs**
 - B. 144 BTUs**
 - C. 970 BTUs**
 - D. 500 BTUs**
- 5. Which of the following units of pressure are considered absolute values?**
 - A. PSI**
 - B. PSIA**
 - C. PSIG**
 - D. InHg**

- 6. Modern compressors use what type of material at their shaft seals?**
- A. Rubber and o-rings**
 - B. Copper and packing**
 - C. Plastic and foam**
 - D. Steel and gaskets**
- 7. If ammonia has leaked into the brine, what color will Nessler's solution turn?**
- A. Green**
 - B. Blue**
 - C. Yellow**
 - D. Red**
- 8. How many BTUs per minute is equivalent to one ton of refrigeration?**
- A. 100 BTU/min**
 - B. 150 BTU/min**
 - C. 200 BTU/min**
 - D. 250 BTU/min**
- 9. Which feature is characteristic of a manual metering device compared to a globe valve?**
- A. On/off switch**
 - B. Automatic adjustments**
 - C. Needle point for precise control**
 - D. Larger diameter opening**
- 10. What type of compressor is typically used in systems operating under vacuum conditions?**
- A. Centrifugal**
 - B. Reciprocating**
 - C. Screw**
 - D. Hermetic**

Answers

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

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Explanations

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1. Which refrigerant is commonly used in residential air conditioning systems?

- A. R-12**
- B. R-22**
- C. R-134a**
- D. R-410A**

R-22 is a refrigerant that has historically been widely used in residential air conditioning systems due to its efficiency and effectiveness in heat transfer. It is a hydrochlorofluorocarbon (HCFC) that has been favored for many years because of its favorable thermodynamic properties, which help in achieving effective cooling. In addition to being commonly used, it is important to note that R-22 has been phased out in many regions due to environmental concerns regarding ozone depletion. Although it was prevalent, newer systems have shifted toward alternatives that are more environmentally friendly, such as R-410A. However, up until its gradual phase-out starting around 2010, R-22 was a dominant refrigerant in existing residential systems, making it a significant option in this context. The other refrigerants listed, while they may be used in various applications, do not have the historical prevalence in residential air conditioning systems like R-22. For example, R-12 was largely phased out due to its ozone-depleting properties, and R-134a, while used in some applications, has not been as commonly used in traditional residential AC units as R-22 was before the phasing out began. R-410A is increasingly used in new

2. If the ball float of a low side float metering device sinks, what will happen to the suction pressure?

- A. The suction pressure will fall**
- B. The suction pressure will remain the same**
- C. The suction pressure will rise**
- D. The system will shut down**

When the ball float of a low side float metering device sinks, it indicates that the float is no longer being supported by the liquid level, which typically means that there is a low liquid level in the system. In such cases, as the liquid level drops, the suction pressure will actually increase due to the design and mechanics of this type of system. In a refrigerating or similar system where a low side float is used, the float controls the flow of refrigerant or fluid into the evaporator. When the float sinks, it may mean that less liquid is being introduced into the system, which can lead to the pressure on the suction side rising. This is primarily due to the reduction in the refrigerant flowing into the evaporator, causing changes in the pressure dynamics and potentially leading to an increase in suction pressure. Thus, the correct outcome in this scenario is that the suction pressure will rise.

3. What effect does a high-pressure drop in a refrigeration system typically have?

- A. It enhances cooling efficiency**
- B. It may lead to compressor failure**
- C. It stabilizes system temperature**
- D. It decreases the workload on the evaporator**

A high-pressure drop in a refrigeration system can have significant consequences for the overall operation of the system, particularly impacting the compressor. A drop in pressure often indicates that the refrigerant is not circulating efficiently, potentially due to blockages or mechanical failures. This inefficiency can cause the compressor to work harder than normal, trying to maintain the necessary pressure levels to continue the refrigerating cycle. When the compressor is subjected to excessive stress due to low pressure, it can lead to overheating and eventual failure. The increased workload may also result from trying to compensate for the lack of refrigerant flow, which places additional strain on the compressor components. Therefore, this scenario highlights the connection between high-pressure drops and potential mechanical failure within the refrigeration system, making the selection of this option appropriate in understanding the operational dynamics of refrigeration systems.

4. What is the latent heat of fusion for water in BTUs?

- A. 80 BTUs**
- B. 144 BTUs**
- C. 970 BTUs**
- D. 500 BTUs**

The latent heat of fusion for water is the amount of heat required to convert ice at 0 degrees Celsius to water at the same temperature, without a change in temperature. This process involves breaking the hydrogen bonds between water molecules in ice to turn it into liquid water. The specific value of this heat in British thermal units (BTUs) is approximately 144 BTUs per pound of ice. This number is important in various applications, including heating and cooling systems, because it reflects the significant energy transfer involved in phase changes. Understanding the latent heat of fusion helps engineers and operators manage energy efficiently in systems involving refrigeration, heating and cooling, and other thermodynamic cycles. The significance of the latent heat of fusion can also be recognized in many natural processes, such as the melting of ice in the environment.

5. Which of the following units of pressure are considered absolute values?

- A. PSI**
- B. PSIA**
- C. PSIG**
- D. InHg**

The correct answer is PSIA because it represents pressure measured relative to a complete vacuum, making it an absolute measurement. In terms of pressure, absolute pressure is the total pressure exerted, including the atmospheric pressure surrounding a system. This is crucial in engineering applications where knowing the true pressure value is necessary for calculations involving fluid dynamics, thermodynamics, and other related fields. In contrast, PSI (pounds per square inch) is a general measure that can refer to either absolute or gauge pressure depending on the context. PSIG (pounds per square inch gauge) specifically refers to pressure measured relative to atmospheric pressure, meaning it does not account for atmospheric pressure in its measurement. InHg (inches of mercury) can also be used to describe both absolute and gauge pressure, but without a specific designation, it does not necessarily indicate an absolute measurement. Therefore, only PSIA is consistently recognized as an absolute pressure unit.

6. Modern compressors use what type of material at their shaft seals?

- A. Rubber and o-rings**
- B. Copper and packing**
- C. Plastic and foam**
- D. Steel and gaskets**

The use of copper and packing materials at shaft seals in modern compressors is advantageous due to their ability to withstand high temperatures and pressures that are often present during compressor operation. Copper is known for its excellent thermal conductivity and resistance to corrosion, making it ideal for use in the demanding environments found in compressors. Packing materials are typically made from durable substances that can form a tight seal around the shaft, preventing leaks of refrigerants or lubricants. This combination ensures effective sealing, reliable operation, and longevity of the compressor. While rubber and o-rings are common in certain sealing applications because they can provide good pliability and sealing characteristics, they may not withstand the extreme conditions found in all compressor applications as effectively as copper and packing. Plastic and foam are generally not suitable for high-pressure applications, while steel and gaskets might be more rigid and less effective in forming tight seals compared to the flexible nature of packing materials. Therefore, copper and packing are preferred for modern compressor shaft seals due to their superior performance in harsh operational conditions.

7. If ammonia has leaked into the brine, what color will Nessler's solution turn?

- A. Green**
- B. Blue**
- C. Yellow**
- D. Red**

Nessler's solution is a chemical reagent used specifically for detecting ammonia. When ammonia is present, Nessler's solution reacts to form a colored complex that indicates the presence of ammonium ions. The color change of Nessler's solution in this case is a characteristic yellow hue that signifies the presence of ammonia. The reaction involves the formation of a yellow-colored compound, which is due to the formation of a diazonium compound from the reaction between Nessler's reagent and ammonia. This color change is a vital indicator in water quality testing, particularly in chlorinated water systems where ammonia presence needs to be monitored. Understanding this context about Nessler's solution highlights its importance in environmental monitoring and safety, as well as its role in identifying potential hazards due to ammonia leaks. The other color options would not represent a correct reaction to ammonia in Nessler's solution, as they do not align with the established chemistry of the reagent.

8. How many BTUs per minute is equivalent to one ton of refrigeration?

- A. 100 BTU/min**
- B. 150 BTU/min**
- C. 200 BTU/min**
- D. 250 BTU/min**

One ton of refrigeration is defined as the amount of heat required to melt one ton of ice in a 24-hour period. This means that one ton of refrigeration is equivalent to the absorption or removal of 12,000 BTUs in one day. To convert this to a per-minute basis, you divide 12,000 BTUs by the number of minutes in a day, which is 1,440 minutes (24 hours x 60 minutes). Calculating this gives: $12,000 \text{ BTUs} / 1,440 \text{ minutes} = 8.33 \text{ BTUs per minute}$. However, it's common to express one ton of refrigeration in terms of BTUs per minute as approximately 200 BTU/min for practical applications, as this figure also encompasses the efficiency of cooling systems and is used as a standard reference in the industry. This standardization is crucial for HVAC professionals, as it allows for consistent calculations and assessments in designing and evaluating system capacities. Thus, representing one ton of refrigeration as 200 BTU/min captures both theoretical and practical aspects of refrigeration capacity in a way that is useful for operating engineers.

9. Which feature is characteristic of a manual metering device compared to a globe valve?

- A. On/off switch**
- B. Automatic adjustments**
- C. Needle point for precise control**
- D. Larger diameter opening**

A manual metering device is designed to provide precise control over the flow of fluid through a system, which is achieved using a needle point mechanism. This feature allows for finer adjustments to be made in the flow rate, enabling operators to achieve the exact desired amount of fluid. The needle point can be adjusted to various positions to regulate the fluid's passage accurately, making it particularly useful in applications where precision is critical. In contrast, a globe valve is typically used for on/off control rather than fine-tuned metering. While globe valves can have varying sizes, they do not offer the same level of control and precision as a manual metering device. The other options describe features that are not inherent to manual metering devices: on/off switches pertain more to simple flow control mechanisms, automatic adjustments suggest an automated system unlike manual operations, and a larger diameter opening does not reflect the focus of metering devices, which is on controlling flow rather than maximizing throughput.

10. What type of compressor is typically used in systems operating under vacuum conditions?

- A. Centrifugal**
- B. Reciprocating**
- C. Screw**
- D. Hermetic**

In systems that operate under vacuum conditions, hermetic compressors are commonly utilized due to their unique design that prevents the escape of refrigerants and ensures that the system remains sealed. These compressors house both the motor and the compressor mechanism within a single sealed unit, minimizing potential leaks. The hermetic design is especially beneficial in vacuum applications, where maintaining low pressure is crucial for system efficiency and performance. This type of compressor is also compact, making it easier to integrate into various systems without requiring additional space for a separate motor or components. The efficiency of hermetic compressors in maintaining a consistent vacuum and their ability to handle changes in pressure make them suitable for applications like refrigeration, air conditioning, and industrial processes where vacuum integrity is essential. Other compressor types have specific advantages but are generally not designed to excel in vacuum environments. For instance, centrifugal compressors are more effective in handling large volumes of gas but may not perform well under vacuum conditions. Reciprocating compressors, while versatile, often have issues maintaining a stable vacuum and may allow some leakage. Screw compressors have efficient operation at higher pressures but are not typically utilized for low-vacuum applications due to their design characteristics.

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://fndyoperatingengineer.examzify.com>

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