

FDNY COF – SUPERVISION OF FIRE ALARM SYSTEMS (Q-01) PRACTICE TEST (SAMPLE) STUDY GUIDE



Prepare with structure. Pass with confidence



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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. If brine becomes saturated with ammonia in a small compression plant, what should you do?**
 - A. Run the brine through the cooling tower and treat it with lime.
 - B. Treat the brine with lime.
 - C. Run it to the sewer and make a new batch.
 - D. Pay no attention to the problem since it will correct itself.
- 2. Freon-12 has similar high and low pressures to which other refrigerant?**
 - A. R-22
 - B. R-40, Methyl Chloride
 - C. R-134a
 - D. R-404A
- 3. What is the conversion of one ton of refrigeration in BTUs per minute?**
 - A. 100 BTU/minute
 - B. 200 BTU/minute
 - C. 300 BTU/minute
 - D. 400 BTU/minute
- 4. Which factor affects the heat exchange efficiency in refrigeration systems?**
 - A. Temperature difference
 - B. Refrigerant type
 - C. System size
 - D. Condensing pressure
- 5. Which type of tachometer utilizes reflecting tape to measure the rotation of an object?**
 - A. The electronic tachometer (stroboscope)
 - B. The digital photo tachometer
 - C. The centrifugal-type tachometer
 - D. The chronometric tachometer

- 6. What is the formula for piston speed?**
- A. $PS = (2 \times \text{Stroke} \times \text{RPM})/12$
 - B. $PS = (\text{Stroke} \times \text{RPM})/6$
 - C. $PS = (\text{Stroke} \times \text{RPM})/12$
 - D. $PS = (2 \times \text{Stroke})/\text{RPM}$
- 7. What aspect is critical in maintaining the performance of a refrigerant-containing vessel?**
- A. Regular visual inspections
 - B. Pressure-limiting devices
 - C. Hydrostatic retesting
 - D. Proper sealing techniques
- 8. What is the effect of increasing the pH of brine to 8?**
- A. Reduces carbonate deposits
 - B. Increases solubility of refrigerant oil
 - C. Prevents ammonia leakage
 - D. Enhances oil cooling capacity
- 9. What does a pressure-relief valve primarily prevent?**
- A. Excessive cooling
 - B. Excess pressure
 - C. Frozen valves
 - D. System leakage
- 10. How much water can an 8" diameter cylinder with a 10" stroke hold?**
- A. 251.2 cubic inches
 - B. 502.4 cubic inches
 - C. 314.0 cubic inches
 - D. 628.0 cubic inches

Answers

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

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Explanations

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1. If brine becomes saturated with ammonia in a small compression plant, what should you do?

- A. Run the brine through the cooling tower and treat it with lime.
- B. Treat the brine with lime.
- C. Run it to the sewer and make a new batch.**
- D. Pay no attention to the problem since it will correct itself.

If brine becomes saturated with ammonia in a small compression plant, the appropriate course of action is to run it to the sewer and make a new batch. This choice is correct because allowing the brine to remain saturated with ammonia can lead to a range of operational and environmental issues. Saturation indicates that the brine has reached its maximum capacity for ammonia, which could result in reduced performance in the cooling process or may potentially overheat equipment and cause corrosion. By diverting the brine to the sewer, you effectively eliminate the concentration of ammonia that could hinder operational efficiency and compliance with environmental regulations. Making a new batch allows you to maintain the proper chemical balance necessary for optimal functioning of the system. The other options, while they may offer some treatment alternatives, do not effectively address the immediate saturation problem. Running brine through a cooling tower or treating it with lime can manage ammonia levels, but such methods may not be sufficient to resolve the saturation issue thoroughly. In the case of ensuring the integrity and safety of the system, making a fresh batch is the most reliable solution.

2. Freon-12 has similar high and low pressures to which other refrigerant?

- A. R-22
- B. R-40, Methyl Chloride**
- C. R-134a
- D. R-404A

Freon-12, also known as dichlorodifluoromethane (CCl₂F₂), shares similar high and low pressures with methyl chloride (R-40). Both refrigerants function effectively in similar temperature and pressure ranges, which makes them comparable in certain applications. R-22, R-134a, and R-404A are all different chemical compounds with distinct physical properties, including pressure ranges. R-22 is a hydrochlorofluorocarbon (HCFC), which is gradually being phased out due to environmental concerns. R-134a, a hydrofluorocarbon (HFC), has different thermodynamic properties, and its pressure characteristics do not align closely with those of Freon-12. R-404A is a blend of different refrigerants and is designed for very different applications than Freon-12, resulting in varying pressure metrics. Understanding these relationships is crucial for selecting the correct refrigerant for specific HVAC systems while maintaining efficiency and compliance with environmental regulations.

3. What is the conversion of one ton of refrigeration in BTUs per minute?

- A. 100 BTU/minute
- B. 200 BTU/minute**
- C. 300 BTU/minute
- D. 400 BTU/minute

One ton of refrigeration is defined as the amount of heat that must be removed to freeze one ton of water at 0 degrees Celsius in a 24-hour period. This unit of measure is pivotal in understanding refrigeration and air conditioning processes. The correct conversion for one ton of refrigeration is 12,000 BTUs per hour. Since we are interested in the rate per minute, we divide this number by 60 (the number of minutes in an hour). Therefore, when you divide 12,000 BTUs by 60 minutes, you arrive at a result of 200 BTU per minute. This conversion is crucial for professionals in HVAC and fire alarm systems, as it allows for proper calculations when determining the capacity of refrigeration systems and ensuring they meet safety and operational standards. Understanding this conversion helps in designing and implementing systems that efficiently handle temperature control and contribute to overall safety against fire hazards caused by improper refrigeration systems.

4. Which factor affects the heat exchange efficiency in refrigeration systems?

- A. Temperature difference**
- B. Refrigerant type
- C. System size
- D. Condensing pressure

The temperature difference is a critical factor in determining the heat exchange efficiency in refrigeration systems. The efficiency of heat exchangers is largely dependent on the temperature gradient between the refrigerant and the environment in which it is operating. A greater temperature difference enhances the driving force for heat transfer, which improves the overall performance of the refrigeration system. When there is a significant disparity in temperature, heat moves more readily from one medium to another, allowing for more efficient cooling or heating within the system. If the temperature difference is small, the heat exchange process becomes less efficient, leading to reduced performance and potentially higher energy costs. Other factors, while they play roles in overall system operation efficiency or capacity, are not as directly linked to the process of heat exchange as the temperature difference. For instance, the refrigerant type can affect the thermodynamic properties of the system, but it does not inherently dictate how well heat can be transferred. Similarly, system size and condensing pressure have their respective impacts on system performance, but the fundamental principle of efficient heat exchange remains tied closely to the temperature differential.

5. Which type of tachometer utilizes reflecting tape to measure the rotation of an object?

- A. The electronic tachometer (stroboscope)
- B. The digital photo tachometer**
- C. The centrifugal-type tachometer
- D. The chronometric tachometer

The digital photo tachometer is the correct answer because it uses a beam of light and a photo sensor to detect the reflections from a surface, such as reflecting tape, attached to a rotating object. When the rotating object moves, the tape reflects light back to the sensor, allowing the tachometer to calculate the speed of rotation based on the frequency of the reflections it receives. This method provides an accurate and non-contact means of measuring rotational speed. In contrast, other types of tachometers operate differently. For example, the electronic tachometer (often referred to as a stroboscope) typically utilizes a strobe light to visually freeze the motion of a surface, allowing the observer to count rotations per minute indirectly, rather than using reflected light to measure speed. The centrifugal-type tachometer works based on the centrifugal force generated by a rotating mechanism, which is not reliant on reflective surfaces. The chronometric tachometer, on the other hand, uses mechanical principles to measure time and speed, usually through an analog mechanism, rather than a photo sensor and reflecting tape. Therefore, the digital photo tachometer is uniquely suited for the purpose of utilizing reflecting tape for its measurements.

6. What is the formula for piston speed?

- A. $PS = (2 \times \text{Stroke} \times \text{RPM})/12$**
- B. $PS = (\text{Stroke} \times \text{RPM})/6$
- C. $PS = (\text{Stroke} \times \text{RPM})/12$
- D. $PS = (2 \times \text{Stroke})/\text{RPM}$

The formula for piston speed is derived from the relationship between the stroke length of the piston, its rotation speed in RPM (revolutions per minute), and the geometry of the engine. The correct formula, which is represented as $PS = (2 \times \text{Stroke} \times \text{RPM})/12$, accurately captures this relationship by incorporating several key components. The term "Stroke" refers to the distance the piston travels from its top position to its bottom position within the cylinder. When considering RPM, which describes how many times the crankshaft completes a full revolution per minute, it is essential to take into account the movement of the piston during each complete revolution. Since the piston moves up and down twice in each full revolution (once in each direction), the stroke length is doubled, giving rise to the "2 x Stroke" factor in the formula. The division by 12 converts the speed into feet per minute, presuming the stroke length is input in inches. This conversion is necessary for the appropriate units to match when calculating piston speed. Understanding the derivation and components of this formula is critical for calculations involving engine mechanics, particularly when determining the speed at which a piston operates within an internal combustion engine. This knowledge can assist in optimizing performance and assessing engine specifications.

7. What aspect is critical in maintaining the performance of a refrigerant-containing vessel?

- A. Regular visual inspections
- B. Pressure-limiting devices
- C. Hydrostatic retesting**
- D. Proper sealing techniques

Maintaining the performance of a refrigerant-containing vessel is essential for ensuring safety and operational efficacy. Hydrostatic retesting plays a critical role in this process. This testing involves filling the vessel with water and then applying pressure to it. This method allows for the detection of leaks and weaknesses in the vessel's structure that may not be visible during a routine inspection. Regularly conducting hydrostatic retesting helps to verify that the material has not degraded and that it can safely contain the refrigerant under pressure. This is particularly important as refrigerants can involve high-pressure environments, and even small leaks can lead to significant safety issues, including potential environmental hazards due to refrigerant release. While other options have their importance—such as visual inspections for immediate issues, pressure-limiting devices for operational safety, and proper sealing techniques for efficient performance—the systematic assurance offered by hydrostatic retesting stands out as critical for the long-term integrity and safety of refrigerant vessels.

8. What is the effect of increasing the pH of brine to 8?

- A. Reduces carbonate deposits**
- B. Increases solubility of refrigerant oil
- C. Prevents ammonia leakage
- D. Enhances oil cooling capacity

Increasing the pH of brine to 8 has a significant effect on the precipitation of certain salts, particularly carbonate compounds. When the pH rises, it tends to reduce the solubility of calcium carbonate and other carbonates, which can lead to a decrease in carbonate deposits forming in the brine system. This is important in applications such as cooling systems or refrigeration where the buildup of such deposits can impair efficiency and lead to operational issues. By controlling the pH and keeping it in the range of 8, the risks associated with carbonate scaling are minimized, which helps maintain the efficiency of the overall system. While the other options might relate to various aspects of refrigeration or brine systems, they do not specifically address the direct impact of pH adjustments on carbonate deposits formed within the brine fluid. Understanding this relationship is critical for optimizing system performance and preventing maintenance issues.

9. What does a pressure-relief valve primarily prevent?

- A. Excessive cooling
- B. Excess pressure**
- C. Frozen valves
- D. System leakage

A pressure-relief valve is a crucial component in a system designed to manage pressure levels. Its primary function is to prevent excessive pressure from building up within piping or equipment. When the pressure exceeds a predetermined threshold, the valve opens to release some of the pressure safely, thus protecting the system from potential damage or failure that could arise from over-pressurization. This preventive measure is essential in ensuring the safe operation of systems, particularly those related to fire alarms and suppression systems, where maintaining a proper pressure balance is vital for functionality and safety. Options such as excessive cooling, frozen valves, and system leakage pertain to different aspects of system operation and maintenance. Excessive cooling involves temperature management, while frozen valves are related to temperature issues affecting valve performance. System leakage refers to loss of fluid or gas from joints or connections, which is not the primary function addressed by a pressure-relief valve. The focus of the valve's design and application is firmly on managing pressure, making the prevention of excessive pressure its key role.

10. How much water can an 8" diameter cylinder with a 10" stroke hold?

- A. 251.2 cubic inches
- B. 502.4 cubic inches**
- C. 314.0 cubic inches
- D. 628.0 cubic inches

To determine the volume of water the cylinder can hold, we need to calculate the volume of a cylinder using the formula: $\text{Volume} = \pi r^2 h$. In this case, the diameter of the cylinder is 8 inches. The radius is half of the diameter, so: $r = \frac{8}{2} = 4$ inches. The stroke (height) of the cylinder is given as 10 inches. Now, substituting the radius and height into the volume formula: $\text{Volume} = \pi (4)^2 (10)$. Calculating the radius squared: $(4)^2 = 16$ square inches. Now, substituting this back into the volume formula: $\text{Volume} = \pi (16)(10) = 160\pi$ cubic inches. Using the approximation of π

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://fdnyq01.examzify.com>

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

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