

New York City Refrigeration License Exam I Practice (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

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- 1. In a multi-stage centrifugal compressor, the volumes of the stages are typically which of the following?**
 - A. The stages increase in volume with each stage**
 - B. The stages decrease in volume with each stage**
 - C. The stages are identical in volume**
 - D. The stages vary widely and unpredictably**

- 2. An engineer suspects a short in the motor windings has caused the motor to trip on overload. What instrument should be used to check the motor?**
 - A. Ammeter**
 - B. Voltmeter**
 - C. Ohmmeter**
 - D. Multimeter**

- 3. When a steam turbine reaches critical speed, the immediate mechanical response is typically?**
 - A. Turbine will vibrate violently**
 - B. Turbine will stall**
 - C. Turbine will overheat**
 - D. Turbine will accelerate uncontrollably**

- 4. Which instrument is specifically used to measure electrical resistance to diagnose winding faults in motors?**
 - A. Ohmmeter**
 - B. Ammeter**
 - C. Voltmeter**
 - D. Multimeter**

- 5. Under NYC fire code, refrigerant storage containers must be approved by which organization?**
 - A. US Department of Transportation**
 - B. EPA**
 - C. OSHA**
 - D. NFPA**

- 6. If a condenser water pump shows noise, fluctuating gauge readings, and the motor runs hot, the recommended action is:**
- A. Turn on Pump #2, Shut off Pump #1, and Troubleshoot Pump #1**
 - B. Replace the Pump Completely**
 - C. Increase the Motor Voltage**
 - D. Ignore It**
- 7. A BTU is a unit of heat. If 10 BTU are transferred to 10 pounds of water, the water temperature rise will be closest to:**
- A. 0.1°F**
 - B. 1°F**
 - C. 10°F**
 - D. 100°F**
- 8. A refrigeration engineer notes excessive cycling of the temperature control on a reciprocating compressor unit. The crankcase temperature is high, the discharge temperature is low, and the suction line temperature is high. Which fault is most likely causing these conditions?**
- A. Faulty compressor valves**
 - B. Low oil level**
 - C. Overcharged refrigerant**
 - D. Faulty thermostat switch**
- 9. A condenser pump circulates water at 85F in, 88F out. If the condenser pressure is high while tubes are clean, which is a likely cause?**
- A. Low ambient temperature**
 - B. Over charge of refrigerant**
 - C. Insufficient water flow**
 - D. Faulty thermostat**

10. To isolate a dual pressure relief valve while the system remains in service, which valve type should be used?

- A. Gate valve**
- B. Three way valve**
- C. Ball valve**
- D. Check valve**

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Answers

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

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Explanations

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1. In a multi-stage centrifugal compressor, the volumes of the stages are typically which of the following?

- A. The stages increase in volume with each stage**
- B. The stages decrease in volume with each stage**
- C. The stages are identical in volume**
- D. The stages vary widely and unpredictably**

In a multi-stage centrifugal compressor, the same mass of gas passes through every stage in sequence, so making each stage the same size and volume helps ensure each stage contributes a similar amount of work and a similar pressure rise. Identical stage volumes mean the flow area, diffuser geometry, and velocity are matched across stages, giving a predictable, uniform head per stage and a clean overall pressure increase when the stage heads multiply. If stages varied in volume, some stages would take more or less energy, creating uneven loading, reduced efficiency, and control challenges as the gas wouldn't raise pressure evenly through the stack. Extreme variation or unpredictable stage sizes would disrupt flow matching and could lead to instability or surge. Therefore, identical stage volumes are the standard design approach.

2. An engineer suspects a short in the motor windings has caused the motor to trip on overload. What instrument should be used to check the motor?

- A. Ammeter**
- B. Voltmeter**
- C. Ohmmeter**
- D. Multimeter**

To check for a short in motor windings, you measure the winding resistance with an ohmmeter. An ohmmeter passes a small current through a winding and reports its resistance, so you can spot a short by seeing abnormally low resistance or a mismatch between windings. If windings are healthy, the resistance will be within the expected range; a short between turns or to another winding will pull that value down, often significantly, and can explain an overload trip. While a voltmeter or ammeter can tell you about supply voltage or current, they don't reveal the internal resistance of the windings. A multimeter can measure resistance too, but the specialized tool for assessing winding continuity and faults is the ohmmeter.

3. When a steam turbine reaches critical speed, the immediate mechanical response is typically?

- A. Turbine will vibrate violently**
- B. Turbine will stall**
- C. Turbine will overheat**
- D. Turbine will accelerate uncontrollably**

When a steam turbine reaches a speed that matches a natural vibration mode of the rotor and its supports, the system goes into resonance. At that critical speed, the unbalance forces and steam excitations are applied in sync with the rotor's natural frequency, so the energy of the motion is transferred efficiently into that vibrational mode. The result is a large, rapid oscillation of the rotor relative to its supports, i.e., a violent vibration. This immediate response happens because damping isn't enough to quickly dissipate the absorbed energy once resonance occurs, so the vibration amplitude rises sharply. Stalling, overheating, or runaway acceleration aren't the immediate mechanical consequence of hitting a critical speed. Stalling is unrelated to rotor resonance, overheating is a thermal issue from sustained operation, and uncontrollable acceleration isn't the typical immediate reaction of the rotor to resonance, which is dominated by the sudden, large vibration of the rotating assembly.

4. Which instrument is specifically used to measure electrical resistance to diagnose winding faults in motors?

- A. Ohmmeter**
- B. Ammeter**
- C. Voltmeter**
- D. Multimeter**

Measuring the resistance of motor windings is best done with an instrument that directly reads electrical resistance. An ohmmeter does just that: it applies a small test current and measures the resulting voltage drop to calculate resistance. This direct reading lets you see if a winding is open (very high or infinite resistance), has degraded insulation or contact (abnormally high resistance), or may have a shorted turn or parallel path (abnormally low resistance). By comparing the measured resistance to the motor's specified winding values, you can diagnose winding faults effectively. Ammeters gauge current, not resistance, so they won't reveal winding integrity. Voltmeters measure voltage, not resistance. A multimeter can measure resistance as one of its functions, but a dedicated ohmmeter provides a more straightforward, focused resistance test for winding faults and is the standard tool for this purpose. Always power off and isolate the winding before testing.

5. Under NYC fire code, refrigerant storage containers must be approved by which organization?

- A. US Department of Transportation**
- B. EPA**
- C. OSHA**
- D. NFPA**

Storage of refrigerants involves handling pressurized hazardous materials, so the containment must have official certification to ensure safety under both storage and potential transport conditions. Under NYC fire code, the organization responsible for approving refrigerant storage containers is the U.S. Department of Transportation. This means the containers are designed, tested, and marked to meet federal requirements for pressure resistance, containment, venting, and labeling, helping prevent leaks or ruptures in a storage area. The EPA regulates environmental aspects of refrigerants themselves, OSHA covers worker safety practices, and NFPA provides standards that the code may reference, but actual container approval comes from DOT. Look for DOT-approved markings on the cylinders and storage vessels as the sign of compliance.

6. If a condenser water pump shows noise, fluctuating gauge readings, and the motor runs hot, the recommended action is:

- A. Turn on Pump #2, Shut off Pump #1, and Troubleshoot Pump #1**
- B. Replace the Pump Completely**
- C. Increase the Motor Voltage**
- D. Ignore It**

When a condenser water pump shows distress signals like noise, fluctuating gauge readings, and a hot-running motor, the priority is to keep the system cooling with the available standby pump while isolating and inspecting the faulty unit. In a dual-pump setup, you don't press on with the problematic pump because the symptoms point to a developing issue—mechanical wear, cavitation, air entrainment, a clogged impeller, or bearing problems—that can worsen if operated. By turning on the second pump to maintain flow, shutting off the first pump to stop the worsening condition, and then troubleshooting the first pump, you preserve system performance and prevent further damage. Replacing the pump completely isn't the immediate move when a backup is available and you can diagnose the issue first. Increasing the motor voltage would risk overloading and further damage, and ignoring the problem could lead to a pump failure and potential condenser inefficiency.

7. A BTU is a unit of heat. If 10 BTU are transferred to 10 pounds of water, the water temperature rise will be closest to:
- A. 0.1°F
 - B. 1°F**
 - C. 10°F
 - D. 100°F

The main idea is how heat changes temperature when you know the mass and the substance's specific heat. For water, the specific heat is 1 BTU per pound per degree Fahrenheit. That means to raise 1 pound of water by 1°F you need 1 BTU. Here, you're applying 10 BTU to 10 pounds of water. Use the formula $\Delta T = Q / (m \times c)$. With $Q = 10$ BTU, $m = 10$ lb, and $c = 1$ BTU/(lb·°F), you get $\Delta T = 10 / (10 \times 1) = 1^\circ\text{F}$. So the water temperature rises about 1°F. The other options would require different amounts of energy for the given mass (0.1°F would need 1 BTU total for 10 lb, 10°F would need 100 BTU, and 100°F would need 1000 BTU).

8. A refrigeration engineer notes excessive cycling of the temperature control on a reciprocating compressor unit. The crankcase temperature is high, the discharge temperature is low, and the suction line temperature is high. Which fault is most likely causing these conditions?
- A. Faulty compressor valves
 - B. Low oil level**
 - C. Overcharged refrigerant
 - D. Faulty thermostat switch

The key idea is that oil level in a reciprocating compressor isn't just about lubrication—it also governs heat removal from the machine. When oil is low, the moving parts don't get enough lubrication and the oil film that carries heat away from the compression process is diminished. That leads to overheating of the compressor's crankcase because more friction and less heat transfer are happening inside. With excessive temperature cycling, the control system is trying to protect the unit from this overheating, so it short-cycles as the crankcase overheats and then cools. The crankcase getting hot is the most direct clue that lubrication and heat management are failing. The suction line temperature rising can be explained by heat being conducted from the overheated crankcase toward the suction side, or by the compressor operating under poor lubrication and inefficiency, which allows more heat to be transferred into the refrigerant as it returns to the evaporator. The discharge gas temperature being lower than expected fits with reduced lubrication and poorer heat transfer in the compression chamber, so the gas doesn't heat up as much on discharge as it would with proper lubrication and cooling. Other faults would typically show different patterns—for example, valve problems or an overcharged refrigerant usually push discharge temperature higher rather than lower, and a faulty thermostat switch would alter cycling behavior without the same crankcase overheating pattern.

9. A condenser pump circulates water at 85F in, 88F out. If the condenser pressure is high while tubes are clean, which is a likely cause?

- A. Low ambient temperature**
- B. Over charge of refrigerant**
- C. Insufficient water flow**
- D. Faulty thermostat**

Condenser head pressure is largely controlled by how much refrigerant is circulating and how effectively the condenser can reject heat. If the condenser tubes are clean and the water flow is adequate (as shown by only a small rise from 85°F to 88°F), a high condenser pressure points to too much refrigerant in the system. An overcharged refrigerant charge means more vapor or liquid must be condensed at the same condenser temperature, which raises the pressure on the high side. The other options don't fit as well: low ambient temperature would tend to reduce head pressure, insufficient water flow would typically show a larger rise in the cooling water temperature and can raise pressure too—but the clean tubes and only a small water rise argue against that, and a faulty thermostat wouldn't directly cause high condenser pressure.

10. To isolate a dual pressure relief valve while the system remains in service, which valve type should be used?

- A. Gate valve**
- B. Three way valve**
- C. Ball valve**
- D. Check valve**

To isolate a dual pressure relief valve without taking the system offline, you need a valve that can redirect the flow around the valve while keeping the process running. A three-way valve can do this by providing a bypass path. In one position it routes flow through the normal line around the relief valve, and in another position it connects the supply to a bypass so the relief valve can be isolated and serviced without interrupting service to the rest of the system. Gate valves or ball valves can shut off flow, but using them alone would interrupt the process and don't provide a built-in bypass path. A check valve prevents reverse flow but does not offer a way to bypass or isolate the relief valve while keeping the system in operation.

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://newyorkrefrigeration1.examzify.com>

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

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