

# CDC 3E151 Volume 5 HVAC/R Fundamentals Practice Test (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. What should be verified before adjusting a TXV superheat?**
  - A. The pressure readings are accurate**
  - B. The rest of the system is functioning properly**
  - C. The refrigerant levels are adequate**
  - D. The ambient temperature is stable**
  
- 2. Why is enthalpy significant in HVAC calculations?**
  - A. It measures environmental temperature**
  - B. It represents the total heat content of a system**
  - C. It indicates air pressure levels**
  - D. It calculates air flow rates**
  
- 3. What happens to the exhaust valve of a compressor during the intake stroke?**
  - A. It remains open**
  - B. It closes due to backpressure from the high side**
  - C. It opens to release pressure**
  - D. It is immaterial during this phase**
  
- 4. What does the term "specific heat" refer to?**
  - A. The proportion of heat used in home heating systems**
  - B. The amount of heat required to raise the temperature of a unit mass of a substance by one degree Celsius**
  - C. The total heat produced by an HVAC system**
  - D. The heat loss in a building**
  
- 5. What is the effect of counter flow in a double-tube condenser?**
  - A. Decreases the system pressure**
  - B. Increases the refrigerant charge**
  - C. Reduces energy consumption**
  - D. Improves condenser efficiency**

- 6. Which of the following is NOT a main component of an HVAC system?**
- A. Heating equipment**
  - B. Cooling equipment**
  - C. Filtration systems**
  - D. Ventilation systems**
- 7. On a condenser splitting capacity control system, a three-way solenoid valve sends refrigerant to both condensers during warmer weather conditions because the refrigerant needs:**
- A. Less space to reduce pressure**
  - B. More space to sustain proper head pressures and reject heat**
  - C. Constant flow to both condensers**
  - D. Higher temperatures for efficiency**
- 8. What step follows adding refrigerant to decrease subcooling?**
- A. Wait for the system to cool down**
  - B. Read the new superheat**
  - C. Adjust the TXV setting**
  - D. Disconnect the gauges**
- 9. What is the main purpose of a filter-drier in a refrigeration system?**
- A. To raise refrigerant pressure**
  - B. To remove moisture and contaminants**
  - C. To enhance cooling efficiency**
  - D. To reduce system noise**
- 10. What does HVAC stand for?**
- A. Heating, Ventilation, and Air Cooling**
  - B. Heating, Ventilation, and Air Conditioning**
  - C. Heating, Ventilating, and Air Control**
  - D. Heating and Ventilation of Air Conditioning**

## Answers

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

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## **Explanations**

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## 1. What should be verified before adjusting a TXV superheat?

- A. The pressure readings are accurate
- B. The rest of the system is functioning properly**
- C. The refrigerant levels are adequate
- D. The ambient temperature is stable

Before adjusting a TXV (Thermal Expansion Valve) superheat, it is crucial to verify that the rest of the system is functioning properly. This is because any issues in other components of the HVAC/R system can significantly affect the performance and efficiency of the TXV. If the system has problems such as restricted airflow, inconsistent refrigerant flow, or issues with the compressor, the superheat adjustment may not yield the desired results or could lead to further inefficiencies. Ensuring proper system operation creates a reliable baseline for any adjustments made to the TXV superheat. This allows the technician to accurately assess how the TXV adjusts under normal operating conditions, which is essential for achieving optimal cooling performance and preventing compressor damage or other operational issues. While accurate pressure readings, adequate refrigerant levels, and stable ambient temperatures are important considerations in the overall system performance, they primarily inform the technician about the current system status. However, without confirming that the system is operational and free from faults, any adjustments made to the TXV may not resolve the underlying issues. Thus, verifying the proper functioning of the entire system is foundational for successful adjustment.

## 2. Why is enthalpy significant in HVAC calculations?

- A. It measures environmental temperature
- B. It represents the total heat content of a system**
- C. It indicates air pressure levels
- D. It calculates air flow rates

Enthalpy is significant in HVAC calculations because it represents the total heat content of a system, which is vital for understanding the energy dynamics involved in heating and cooling processes. This measure includes not just the internal energy of the fluid but also the energy associated with the pressure and volume of the substance. In HVAC applications, knowing the enthalpy of the air or refrigerant allows engineers and technicians to determine how much heat is required to heat or cool a space, facilitating accurate design and control of climate systems. By using enthalpy, HVAC professionals can also evaluate the efficiency of different systems and predict the amount of energy needed for certain conditions. This understanding is crucial for ensuring comfortable indoor environments while optimizing energy usage. Therefore, recognizing the total heat content, which enthalpy provides, is essential in the design, control, and efficiency analysis of HVAC systems.

**3. What happens to the exhaust valve of a compressor during the intake stroke?**

- A. It remains open**
- B. It closes due to backpressure from the high side**
- C. It opens to release pressure**
- D. It is immaterial during this phase**

During the intake stroke of a compressor, the exhaust valve closes due to backpressure from the high side of the system. This backpressure prevents refrigerant from flowing back into the compressor during the intake phase. As the piston moves down during the intake stroke, it creates a vacuum in the compressor's cylinder, allowing the refrigerant to enter through the intake valve. The exhaust valve, which is connected to the high-pressure side of the system, must remain closed to ensure that the higher pressure does not push refrigerant back into the cylinder. This action is vital to maintain the efficiency and effectiveness of the compressor in moving the refrigerant through the system, as any backflow would disrupt the refrigeration cycle.

**4. What does the term "specific heat" refer to?**

- A. The proportion of heat used in home heating systems**
- B. The amount of heat required to raise the temperature of a unit mass of a substance by one degree Celsius**
- C. The total heat produced by an HVAC system**
- D. The heat loss in a building**

The term "specific heat" refers to the amount of heat required to raise the temperature of a unit mass of a substance by one degree Celsius. This property is important in thermodynamics because it determines how much energy is needed to change the temperature of a material. Different substances have varying specific heat capacities, which affects their thermal behavior under heating or cooling conditions. Understanding specific heat is crucial for HVAC/R professionals, as it helps in designing systems that can efficiently regulate temperature and manage heat transfer in various applications.

**5. What is the effect of counter flow in a double-tube condenser?**

- A. Decreases the system pressure**
- B. Increases the refrigerant charge**
- C. Reduces energy consumption**
- D. Improves condenser efficiency**

In a double-tube condenser, counter flow refers to the direction of the coolant flow adjacent to the refrigerant flow. This configuration is significant because it creates a larger temperature differential between the refrigerant and the cooling fluid. As the hot refrigerant moves in the opposite direction to the cooler fluid, it enables more effective heat transfer. The primary benefit of this arrangement is that it improves the overall efficiency of the condenser. By maintaining a higher temperature difference along the length of the tubes, more heat can be continuously absorbed from the refrigerant. This enhanced heat exchange results in better condensation at lower temperatures, ultimately leading to a more efficient cooling process. Therefore, a counter flow configuration significantly contributes to the condenser's performance, resulting in improved efficiency.

**6. Which of the following is NOT a main component of an HVAC system?**

- A. Heating equipment**
- B. Cooling equipment**
- C. Filtration systems**
- D. Ventilation systems**

The correct choice identifies filtration systems as not being a main component of an HVAC system in the context of the fundamental components that typically encompass the heating, cooling, and ventilation functions of the system. HVAC systems are generally composed of three primary components: heating equipment, cooling equipment, and ventilation systems. Heating equipment is responsible for generating warmth during colder months, cooling equipment provides relief from heat during warmer months, and ventilation systems ensure a continuous supply of fresh air and proper airflow throughout a building. While filtration systems play a crucial role in ensuring air quality by removing dust, allergens, and other particulates from the air, they are typically considered auxiliary to the main functional components of the HVAC system. Their primary purpose is not to control temperature or humidity directly, but rather to improve indoor air quality. Thus, while necessary for optimal performance, filtration systems do not represent a fundamental component that defines the HVAC system as heating, cooling, and ventilation do.

**7. On a condenser splitting capacity control system, a three-way solenoid valve sends refrigerant to both condensers during warmer weather conditions because the refrigerant needs:**

- A. Less space to reduce pressure**
- B. More space to sustain proper head pressures and reject heat**
- C. Constant flow to both condensers**
- D. Higher temperatures for efficiency**

The correct answer emphasizes the need for more space within the system to sustain proper head pressures and effectively reject heat. In warmer weather conditions, the heat load on the condensers increases; therefore, the refrigerant must have adequate capacity to handle the additional thermal energy and maintain proper operation. When the refrigerant flows to both condensers, it effectively increases the surface area available for heat exchange, allowing for more efficient heat rejection. This ensures that the system can maintain the necessary head pressure, which is crucial for the proper cycling and functionality of the entire refrigeration system. Proper head pressures are important because they ensure the refrigerant remains in a gaseous state until it reaches the condenser, allowing it to properly condense into a liquid upon releasing heat. By utilizing both condensers, the system can better manage higher ambient conditions and maintain overall efficiency and reliability.

**8. What step follows adding refrigerant to decrease subcooling?**

- A. Wait for the system to cool down**
- B. Read the new superheat**
- C. Adjust the TXV setting**
- D. Disconnect the gauges**

After adding refrigerant to decrease subcooling, the appropriate next step is to read the new superheat. This action is essential because it provides critical information regarding the operational efficiency of the system. Superheat is the temperature of the refrigerant vapor above its boiling point at a given pressure. Once refrigerant is added, it's crucial to check the superheat to ensure that the evaporator is functioning properly and that an adequate amount of refrigerant is evaporating within the coil. This measure helps confirm that the system is set up for optimal performance, as both subcooling and superheat are vital indicators of a properly charged system. Adjustments based on superheat readings can indicate whether the expansion valve is properly metering refrigerant into the evaporator. Thus, monitoring and reading the superheat after introducing refrigerant is a necessary step in maintaining system efficiency and performance.

**9. What is the main purpose of a filter-drier in a refrigeration system?**

- A. To raise refrigerant pressure**
- B. To remove moisture and contaminants**
- C. To enhance cooling efficiency**
- D. To reduce system noise**

The primary function of a filter-drier in a refrigeration system is to remove moisture and contaminants from the refrigerant. Moisture and particulate materials can cause significant problems, such as corrosion, ice formation, and clogging of components, which can lead to system failures. The filter-drier typically contains desiccant materials that absorb moisture, along with a filter that captures solid particles, ensuring the refrigerant remains clean and dry as it circulates through the system. By maintaining a proper refrigerant state, the filter-drier plays a crucial role in the overall reliability and efficiency of the refrigeration system. Other options such as raising refrigerant pressure, enhancing cooling efficiency, or reducing system noise do not pertain to the main function of the filter-drier, which is specifically focused on the quality of the refrigerant.

## 10. What does HVAC stand for?

- A. Heating, Ventilation, and Air Cooling
- B. Heating, Ventilation, and Air Conditioning**
- C. Heating, Ventilating, and Air Control
- D. Heating and Ventilation of Air Conditioning

HVAC stands for Heating, Ventilation, and Air Conditioning. This term encompasses the various technologies and systems used to regulate indoor environments by controlling temperature, humidity, and air quality. Heating refers to the systems that provide warmth to the air during colder weather. Ventilation is the process of exchanging or replacing air in a space to provide high indoor air quality, which includes removing moisture, odors, smoke, heat, dust, airborne bacteria, and carbon dioxide. Air conditioning relates to cooling and dehumidifying the air in a building. Together, these components create a comprehensive system design for maintaining comfort and safety within indoor spaces. The other options fail to accurately represent the full scope of what HVAC entails. Some use terminology that is either outdated or not accurately reflective of the field's standards, while others omit essential functions of the systems involved in HVAC.

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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](mailto:hello@examzify.com).**

**Or visit your dedicated course page for more study tools and resources:**

**<https://cdc3e151vol5hvacrfundamentals.examzify.com>**

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

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