

HVAC NATE HEAT PUMP PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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 example of a power-passing device?**
 - A. Thermostat
 - B. Voltage regulator
 - C. Fan switch
 - D. Current monitor
- 2. What is the coil of a potential relay connected to in a compressor system?**
 - A. The run and neutral terminals
 - B. The common and start terminals
 - C. The time delay switch
 - D. The overload protection device
- 3. What is the absolute pressure at sea level if a gauge pressure is 35 psig?**
 - A. 14.7 psia
 - B. 49.7 psia
 - C. 35 psia
 - D. 29.9 psia
- 4. If a system is supplied with a charge for a 15-foot line set, which is longer than the set's length, how much refrigerant will need to be added for a 25-foot line set?**
 - A. 4 lbs 10 oz
 - B. 5 lbs 0 oz
 - C. 6 lbs
 - D. 7 lbs 5 oz
- 5. What issue arises when using a running trap on a condensate line at the evaporator coil?**
 - A. It allows excess water to drain
 - B. It promotes better airflow
 - C. It does not allow for proper drainage
 - D. It increases water retention

- 6. Do electric air cleaners effectively remove odors from the air?**
- A. Yes
 - B. No
 - C. Only in combination with other filters
 - D. Only in commercial settings
- 7. Where are drive slips typically installed within a duct system?**
- A. On the longer sides of rectangular duct
 - B. On the shorter sides of rectangular duct
 - C. At the joints of round duct
 - D. On the edges of square duct
- 8. Which of the following best describes "defrost mode" in a heat pump?**
- A. A mode used during system start-up
 - B. A mode that prevents overheating of the compressor
 - C. A function to reduce ice buildup on the outdoor coil
 - D. A setting for maximum cooling efficiency
- 9. What occurs if the CFM in a duct system is too low?**
- A. Increased compressor efficiency
 - B. Decreased air quality
 - C. Noise reduction
 - D. Temperature stabilization
- 10. What is the thermal balance point of a dual fuel heat pump?**
- A. Outdoor conditions at which the capacity of auxiliary heat matches the heating load
 - B. Outdoor temperature at which the heat pump operates at maximum efficiency
 - C. The temperature at which the compressor stops operating
 - D. Indoor temperature level for optimal comfort

Answers

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

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Explanations

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1. What is an example of a power-passing device?

- A. Thermostat
- B. Voltage regulator
- C. Fan switch**
- D. Current monitor

A power-passing device is one that allows electrical power to pass through it while functioning in a control or switching capacity. The fan switch serves as an excellent example of this type of device because it directly regulates power to the fan motor in order to control its operation. When the switch is closed, it permits electrical current to flow to the fan, enabling it to run. When opened, it interrupts the flow of current, effectively turning the fan off. In contrast, a thermostat primarily serves to detect temperature and provide control signals rather than directly manage the flow of electricity for a fan. A voltage regulator is designed to maintain a constant output voltage rather than passing power for operational control. Meanwhile, a current monitor tracks the current flowing through a circuit but does not facilitate the passage of power for operational control like the fan switch does. Therefore, the fan switch is the most appropriate example of a power-passing device in this context.

2. What is the coil of a potential relay connected to in a compressor system?

- A. The run and neutral terminals
- B. The common and start terminals**
- C. The time delay switch
- D. The overload protection device

In a compressor system, the coil of a potential relay is connected to the common and start terminals of the compressor. This is important because the potential relay is designed to sense the voltage difference across the start winding of the motor once the compressor begins operating. When the system powers up, the potential relay measures the potential (voltage) created by the difference in the magnetic fields of the common and start windings. As the compressor starts and reaches a certain speed, the relay activates and disconnects the start winding from the circuit, allowing the run winding to carry the load independently. This is essential for efficient operation of the compressor and prevents overheating or damage that could occur if the start winding were to remain energized longer than necessary. Connecting the potential relay to the run and neutral terminals, the time delay switch, or the overload protection device would not facilitate this critical function of sensing and disconnecting the start winding, thereby rendering those options unsuitable for the mechanism the potential relay serves.

3. What is the absolute pressure at sea level if a gauge pressure is 35 psig?

- A. 14.7 psia
- B. 49.7 psia**
- C. 35 psia
- D. 29.9 psia

To determine the absolute pressure at sea level when given a gauge pressure, it's essential to understand the difference between gauge pressure and absolute pressure. Gauge pressure measures the pressure relative to atmospheric pressure, while absolute pressure measures the total pressure, including atmospheric pressure. At sea level, the standard atmospheric pressure is approximately 14.7 psi. Therefore, to find the absolute pressure, you add the gauge pressure to atmospheric pressure. In this case, if the gauge pressure is 35 psig, the calculation for absolute pressure (psia) would be: $\text{Absolute Pressure} = \text{Gauge Pressure} + \text{Atmospheric Pressure}$
 $\text{Absolute Pressure} = 35 \text{ psig} + 14.7 \text{ psi} = 49.7 \text{ psia}$ This calculation shows that when you add the standard atmospheric pressure to the provided gauge pressure, you arrive at the correct absolute pressure of 49.7 psia. Understanding this relationship between gauge and absolute pressure is crucial for accurately interpreting pressure readings in HVAC systems and other applications.

4. If a system is supplied with a charge for a 15-foot line set, which is longer than the set's length, how much refrigerant will need to be added for a 25-foot line set?

- A. 4 lbs 10 oz
- B. 5 lbs 0 oz
- C. 6 lbs**
- D. 7 lbs 5 oz

To understand the correct response regarding the additional refrigerant needed for the longer line set, it's essential to recognize how refrigerant capacity is typically affected by line set length. When a heat pump system is charged for a specific line set length—in this case, 15 feet—it is calibrated to accommodate the refrigerant volume required to maintain efficiency and correct operation for that length. If the actual line set length is extended to 25 feet, additional refrigerant is necessary to compensate for the increased volume of the extended piping. The standard practice often suggests that for every additional foot of line set beyond the length for which the system was charged, a specific volume of refrigerant must be added. This practice can reflect the increased hydraulic resistance and thermal dynamics introduced by the longer refrigerant path. Thus, when determining how much additional refrigerant should be added for the extended 25-foot line set, that calculation would generally be based on the extra 10 feet beyond the 15-foot charge, leading to a total adjustment that aligns with the system's design requirements. In this scenario, the estimated refrigerant volume needed for the 25-foot line set aligns with the specific amount indicated in the correct answer, making it both reasonable and grounded in established HVAC calculations.

5. What issue arises when using a running trap on a condensate line at the evaporator coil?

- A. It allows excess water to drain
- B. It promotes better airflow
- C. It does not allow for proper drainage**
- D. It increases water retention

Using a running trap on a condensate line at the evaporator coil can result in improper drainage, as the running trap creates a condition where the condensate cannot flow freely out of the evaporator. Ideally, condensate should drain by gravity to ensure efficient removal of moisture from the system. If a running trap is installed, it can trap water in the line, leading to an accumulation that may back up into the evaporator coil. This improper drainage can create several potential issues, such as increased humidity levels in the conditioned space, the risk of water damage, mold growth, or even a decrease in the system's efficiency since the evaporator may not operate effectively with standing water present. Proper drainage is essential for optimal heat pump operation, ensuring that excess moisture is removed and allowing for better heat transfer at the evaporator coil.

6. Do electric air cleaners effectively remove odors from the air?

- A. Yes
- B. No**
- C. Only in combination with other filters
- D. Only in commercial settings

Electric air cleaners generally do not effectively remove odors from the air because their primary function is to capture particles such as dust, pollen, and smoke through various filtration mechanisms. While some air cleaners incorporate features that may help in odor reduction, such as UV lights or photocatalytic oxidation, these are not standard capabilities of all electric air cleaning appliances. The removal of odors typically requires a different approach, such as activated carbon filters that are specifically designed to adsorb gaseous pollutants, including smells. Thus, relying solely on electric air cleaners without these specialized components would likely leave many odors unaddressed. Understanding the appropriate technologies required for odor removal is crucial for effectively improving indoor air quality.

7. Where are drive slips typically installed within a duct system?

- A. On the longer sides of rectangular duct
- B. On the shorter sides of rectangular duct**
- C. At the joints of round duct
- D. On the edges of square duct

Drive slips are typically installed on the shorter sides of rectangular ducts. This design choice facilitates proper alignment and connection between segments of ductwork, which is especially important in maintaining optimal airflow and minimizing potential leaks. The shorter sides allow for easier adjustments and tighter seals when connecting sections of duct, helping to ensure efficient operation of the HVAC system. Choosing the shorter sides for drive slips also enables the duct sections to expand and contract with temperature fluctuations without compromising the integrity of the joint. This flexibility is crucial for maintaining the overall efficiency and effectiveness of the heat pump system.

8. Which of the following best describes "defrost mode" in a heat pump?

- A. A mode used during system start-up
- B. A mode that prevents overheating of the compressor
- C. A function to reduce ice buildup on the outdoor coil**
- D. A setting for maximum cooling efficiency

Defrost mode in a heat pump is primarily a function designed to reduce ice buildup on the outdoor coil. During the heating cycle, especially in colder conditions, moisture can freeze on the coil, impeding airflow and reducing heating efficiency. When the outdoor temperature is low and humidity is present, the heat pump detects frost accumulation and automatically switches to defrost mode. In this mode, the system temporarily reverses the refrigeration cycle, directing warmer refrigerant to the outdoor coil to melt the ice. This process allows the heat pump to maintain efficient operation and optimal performance, ensuring that it continues to provide heating effectively. Utilizing defrost mode is essential for preventing ice build-up that can lead to system inefficiencies, increased energy use, and potential damage to components.

9. What occurs if the CFM in a duct system is too low?

- A. Increased compressor efficiency
- B. Decreased air quality**
- C. Noise reduction
- D. Temperature stabilization

When the cubic feet per minute (CFM) in a duct system is too low, it results in decreased air quality. Insufficient airflow leads to a stagnation of air within the space, causing particulate matter, dust, and other contaminants to remain in the environment longer than they should. This buildup can negatively affect indoor air quality, leading to potential health issues for occupants due to the concentration of allergens and pollutants. In addition, low airflow may cause stratification of temperatures within the space, where some areas become too hot or too cold, further exacerbating poor air quality due to ineffective ventilation. Proper CFM levels are crucial for ensuring that air is adequately circulated and filtered, which directly impacts the comfort and health of the indoor environment.

10. What is the thermal balance point of a dual fuel heat pump?

- A. Outdoor conditions at which the capacity of auxiliary heat matches the heating load**
- B. Outdoor temperature at which the heat pump operates at maximum efficiency
- C. The temperature at which the compressor stops operating
- D. Indoor temperature level for optimal comfort

The thermal balance point of a dual fuel heat pump refers to the specific outdoor conditions where the capacity of the auxiliary heat source, such as a gas furnace, matches the heating load of the building. At this point, the heat pump can provide all the required heating, but as outdoor temperatures fall further, the auxiliary heat becomes necessary to supplement the heat pump's output and maintain comfort inside the structure. This balance is critical for efficient operation, as it defines when it is more efficient to rely on auxiliary heat rather than solely on the heat pump. Understanding this point helps in optimizing the system's performance and ensuring proper heating efficiency during colder weather conditions while minimizing energy usage and costs. The other options do not accurately define the thermal balance point. For example, operating at maximum efficiency is more related to a heat pump's performance characteristics rather than its operational relationship with auxiliary heat. The point where the compressor stops is related to system safety and performance cut-offs rather than the balance of heating loads. Finally, indoor comfort is a broader concept that encompasses more than just the thermal balance point, focusing instead on overall temperature and humidity conditions within the living space.

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://hvacnateheatpump.examzify.com>

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

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