

# ESCO Heat Pump Practice Test (Sample)

## Study Guide



**Everything you need from our exam experts!**

**Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.**

**ALL RIGHTS RESERVED.**

**No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.**

**Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.**

**SAMPLE**

# 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

SAMPLE

# 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

SAMPLE

- 1. Where does the low pressure refrigerant vapor go after leaving the reversing valve in cooling mode?**
  - A. To the expansion valve**
  - B. To the accumulator**
  - C. To the indoor coil**
  - D. To the outdoor coil**
  
- 2. As outdoor ambient air temperature decreases, what happens to a heat pump's COP?**
  - A. Increases**
  - B. Decreases**
  - C. Remains constant**
  - D. Fluctuates**
  
- 3. How is SEER calculated in a heat pump system?**
  - A. Dividing the total wattage by the cooling load**
  - B. Dividing the BTUs removed by the watts consumed**
  - C. Dividing the energy input by the output temperature**
  - D. Dividing the runtime hours by the temperature difference**
  
- 4. During the defrost cycle, which mode does the system switch to?**
  - A. Heating**
  - B. Cooling**
  - C. Fan**
  - D. Emergency**
  
- 5. A customer reporting periodic cool air during heating mode may be experiencing what issue?**
  - A. A faulty compressor**
  - B. A malfunctioning fan motor**
  - C. A faulty defrost relay**
  - D. Low refrigerant levels**

- 6. What does "stratification" refer to in the context of heat pumps?**
- A. Diurnal temperature variations in building structures**
  - B. The layering of air in a room affecting temperature distribution**
  - C. The process of heating water for radiators**
  - D. Air quality variations due to humidity levels**
- 7. What are the environmental concerns associated with refrigerants?**
- A. High manufacturing costs**
  - B. Ozone depletion potential and global warming potential**
  - C. Low efficiency rates**
  - D. Excessive noise pollution**
- 8. When the modes of a heat pump are reversed, what happens to the refrigerant at the coil serving as the condenser?**
- A. It will evaporate**
  - B. It will bypass the TEV**
  - C. It will accumulate**
  - D. It will condense**
- 9. How do air-source heat pumps function in extremely cold temperatures?**
- A. Their efficiency remains constant**
  - B. The efficiency improves significantly**
  - C. Their efficiency decreases**
  - D. They will operate as regular heaters**
- 10. Which component is responsible for energizing auxiliary heat during the defrost cycle?**
- A. The compressor relay**
  - B. The auxiliary heat switch**
  - C. The defrost relay**
  - D. The main thermostat**

## Answers

SAMPLE

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

SAMPLE

## **Explanations**

SAMPLE

**1. Where does the low pressure refrigerant vapor go after leaving the reversing valve in cooling mode?**

- A. To the expansion valve
- B. To the accumulator**
- C. To the indoor coil
- D. To the outdoor coil

In cooling mode, after the refrigerant exits the reversing valve, it is in a low-pressure vapor state. The correct pathway for this low-pressure refrigerant vapor is to go to the indoor coil. Here, it absorbs heat from the indoor air, causing the refrigerant to change phase from a low-pressure vapor to a low-pressure liquid before moving to the expansion valve. The accumulator is typically part of a heat pump or air conditioning system that helps manage excess liquid refrigerant. It primarily works in conjunction with the compressor and is more relevant in specific system designs, especially when the refrigerant is in a low-pressure liquid state. The expansion valve is a critical component that allows the refrigerant to expand, lowering its pressure further and preparing it for the evaporation process within the indoor coil but does not receive vapor directly from the reversing valve in cooling mode. The outdoor coil is where the refrigerant releases heat and is engaged in the heating mode. Hence, the pathway to the indoor coil for the low-pressure vapor is essential for effective cooling.

**2. As outdoor ambient air temperature decreases, what happens to a heat pump's COP?**

- A. Increases
- B. Decreases**
- C. Remains constant
- D. Fluctuates

As outdoor ambient air temperature decreases, a heat pump's coefficient of performance (COP) typically decreases. The COP is a measure of a heat pump's efficiency, defined as the ratio of heating output to electrical energy input. At lower outdoor temperatures, the heat pump has to work harder to extract heat from the air, as the thermal energy available in the air decreases. This increased effort requires more energy consumption, which negatively impacts the COP. Essentially, as the ambient air gets colder, the system's ability to transfer heat diminishes, leading to a reduced efficiency in converting electrical energy into useful heat energy. The correlation between temperature and COP is crucial for understanding heat pump performance across different climates, making it important for system design and energy efficiency considerations. Thus, the concept that the COP decreases with a drop in outdoor temperatures aligns with the fundamental principles of thermodynamics and heat transfer in the operation of heat pumps.

### 3. How is SEER calculated in a heat pump system?

- A. Dividing the total wattage by the cooling load
- B. Dividing the BTUs removed by the watts consumed**
- C. Dividing the energy input by the output temperature
- D. Dividing the runtime hours by the temperature difference

The Seasonal Energy Efficiency Ratio (SEER) is a critical measure for the efficiency of a heat pump system in cooling mode. It is calculated by dividing the total amount of heat extracted from the indoor air over a cooling season, measured in British Thermal Units (BTUs), by the total energy consumed, measured in watt-hours (or watts). This ratio provides a clear representation of the system's efficiency—the higher the SEER value, the more efficient the heat pump is at providing cooling. Thus, option B correctly reflects the SEER calculation process, as it specifically addresses the relationship between the heat removed (BTUs) and the energy consumed (watts). This ratio is essential for comparing different heat pump systems and understanding their operational costs and performance efficiencies over a period. The other options do not accurately describe the SEER calculation method. Dividing total wattage by the cooling load or energy input by output temperature does not yield the efficiency ratio in the context of seasonal performance. Additionally, using runtime hours divided by temperature difference does not align with the standard definition and calculation of SEER in HVAC systems.

### 4. During the defrost cycle, which mode does the system switch to?

- A. Heating
- B. Cooling**
- C. Fan
- D. Emergency

During the defrost cycle of a heat pump system, the unit typically switches to cooling mode. This may seem counterintuitive, but the purpose of the defrost cycle is to remove frost buildup on the outdoor coil, which can impede the heat pump's efficiency. In cooling mode, the heat pump reverses the flow of refrigerant. This reversal allows the refrigerant to absorb heat from the outdoor coil, effectively melting the frost and allowing it to drain away. While other options like heating mode, fan mode, and emergency mode have specific roles in heat pump operation, they do not facilitate the defrosting process. Heating mode is focused on providing warmth to the indoor space, while fan mode simply circulates air without changing temperature, and emergency mode is typically intended for heating during malfunctions. Thus, switching to cooling mode during the defrost cycle is key to efficiently eliminating frost and maintaining optimal operation of the heat pump system.

**5. A customer reporting periodic cool air during heating mode may be experiencing what issue?**

- A. A faulty compressor**
- B. A malfunctioning fan motor**
- C. A faulty defrost relay**
- D. Low refrigerant levels**

When a customer reports periodic cool air during heating mode, one potential cause could be a faulty defrost relay. The defrost relay is responsible for switching the heat pump into defrost mode to remove frost or ice buildup on the outdoor coil. If the relay is malfunctioning, it may inadvertently cause the system to produce cool air instead of heat. This could lead to periods where the heat pump seems to be blowing cold air when it should be providing warmth. The malfunctioning of a defrost relay is particularly relevant in heat pump systems, as they often face issues with frost accumulation, especially in colder climates. Adequate defrosting is essential for maintaining efficient operation and preventing cool air from interrupting the heating process. If the relay fails to activate correctly, the heat pump may not heat the air properly, resulting in the customer experiencing cool air intermittently. Understanding this component's role helps in diagnosing heating issues effectively, as it addresses a critical function in maintaining the desired indoor temperature during winter conditions.

**6. What does "stratification" refer to in the context of heat pumps?**

- A. Diurnal temperature variations in building structures**
- B. The layering of air in a room affecting temperature distribution**
- C. The process of heating water for radiators**
- D. Air quality variations due to humidity levels**

Stratification in the context of heat pumps refers to the layering of air within a space, which has significant implications for temperature distribution. When warm air rises, it tends to form a layer above cooler air, leading to varying temperatures at different heights in a room. In a heating scenario, this can result in a situation where the upper part of a room is significantly warmer than the lower part, which can affect overall comfort and the efficiency of heating systems. Effective heat pump systems take stratification into account by designing their airflow patterns in a way that promotes even distribution of temperature throughout the room. Understanding this concept is crucial for optimizing heating performance and ensuring that all areas of a space receive adequate warmth. The other options touch on related concepts, like daily temperature changes or air quality, but they do not specifically address the phenomenon of air layering and its impact on temperature within a given space.

**7. What are the environmental concerns associated with refrigerants?**

- A. High manufacturing costs
- B. Ozone depletion potential and global warming potential**
- C. Low efficiency rates
- D. Excessive noise pollution

The primary environmental concerns associated with refrigerants revolve around their potential to deplete the ozone layer and contribute to global warming. Certain refrigerants, particularly the halocarbons like chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), have been shown to release chlorine and bromine when they are broken down in the atmosphere. These substances can lead to the degradation of ozone molecules in the stratosphere, which plays a critical role in protecting the Earth from harmful ultraviolet radiation. In addition to their ozone depletion potential, many refrigerants also have a significant global warming potential (GWP). This means that when these substances escape into the atmosphere, they can trap heat significantly more effectively than carbon dioxide, contributing to climate change. For this reason, the refrigeration industry is progressively transitioning towards more environmentally friendly alternatives that have lower or negligible impacts on ozone depletion and global warming. While other aspects like manufacturing costs, efficiency rates, and noise pollution may be relevant considerations in the context of HVAC systems or heat pumps, they do not pose the same level of environmental risk as the ozone depletion and global warming impacts associated with certain refrigerants. This makes the correct answer about the environmental concerns specifically linked to the use

**8. When the modes of a heat pump are reversed, what happens to the refrigerant at the coil serving as the condenser?**

- A. It will evaporate
- B. It will bypass the TEV**
- C. It will accumulate
- D. It will condense

When the modes of a heat pump are reversed, the function of various components within the system also changes. In this situation, the coil that serves as the condenser in heating mode becomes the evaporator in cooling mode. Therefore, understanding the behavior of the refrigerant during this mode reversal is crucial. As the refrigerant reaches the coil now serving as the condenser, it undergoes a transition from a gaseous state to a liquid state, releasing heat in the process. This change occurs when the refrigerant condenses, which is the primary function of a condenser. Thus, when the heat pump is in heating mode, the refrigerant that enters this coil will actually condense as it releases heat to the surrounding space. So, in the context of this question, when the modes are reversed, and if the refrigerant is at the coil now serving as the condenser in cooling mode, it will undergo condensation, making it evident that the appropriate answer is that it will condense. This is an important aspect of understanding how heat pumps function and how their components work together to transfer heat in opposite directions based on the desired outcome, whether heating or cooling.

**9. How do air-source heat pumps function in extremely cold temperatures?**

- A. Their efficiency remains constant**
- B. The efficiency improves significantly**
- C. Their efficiency decreases**
- D. They will operate as regular heaters**

Air-source heat pumps function by transferring heat from the outside air to the inside of a building. In extremely cold temperatures, the amount of available heat in the outside air decreases significantly, which affects the heat pump's operational efficiency. As the temperature drops, the heat pump must work harder to extract heat from the cold air, leading to a reduction in efficiency. This is because the heat transfer process becomes less effective, resulting in a lower coefficient of performance (COP). The colder the external air, the more energy the heat pump uses to provide the same amount of heating, which can also lead to higher energy costs and reduced heating capacity. In contrast, while some systems may switch to auxiliary heat sources or operate differently under extreme conditions, they do not function as regular heaters in the conventional sense; they still rely on the principles of heat transfer. Therefore, the understanding that their efficiency decreases in extremely cold temperatures highlights the specific challenges air-source heat pumps face in maintaining effective heating performance.

**10. Which component is responsible for energizing auxiliary heat during the defrost cycle?**

- A. The compressor relay**
- B. The auxiliary heat switch**
- C. The defrost relay**
- D. The main thermostat**

The defrost relay plays a crucial role during the defrost cycle of a heat pump system. When the system identifies that frost has built up on the outdoor coil, the defrost relay is activated. Its primary function is to switch the system into defrost mode, allowing the heat pump to reverse its operation temporarily to melt the frost. During this defrost cycle, the heat pump may require additional heat to ensure the indoor space remains comfortable. The defrost relay controls the activation of auxiliary heating elements, which provide that necessary heat. By energizing these auxiliary heat sources, the defrost relay ensures that the system can maintain the desired indoor temperature while the outdoor coil is being defrosted. The other components listed do have their functions within the heat pump system. The compressor relay is primarily responsible for turning the compressor on and off, while the auxiliary heat switch controls the overall use of auxiliary heating when needed but is not specifically tied to the defrost process. The main thermostat is responsible for maintaining the set temperature in the living space but does not directly manage the defrost cycle or the activation of auxiliary heat during it.

## 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://escoheatpump.examzify.com>**

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

SAMPLE