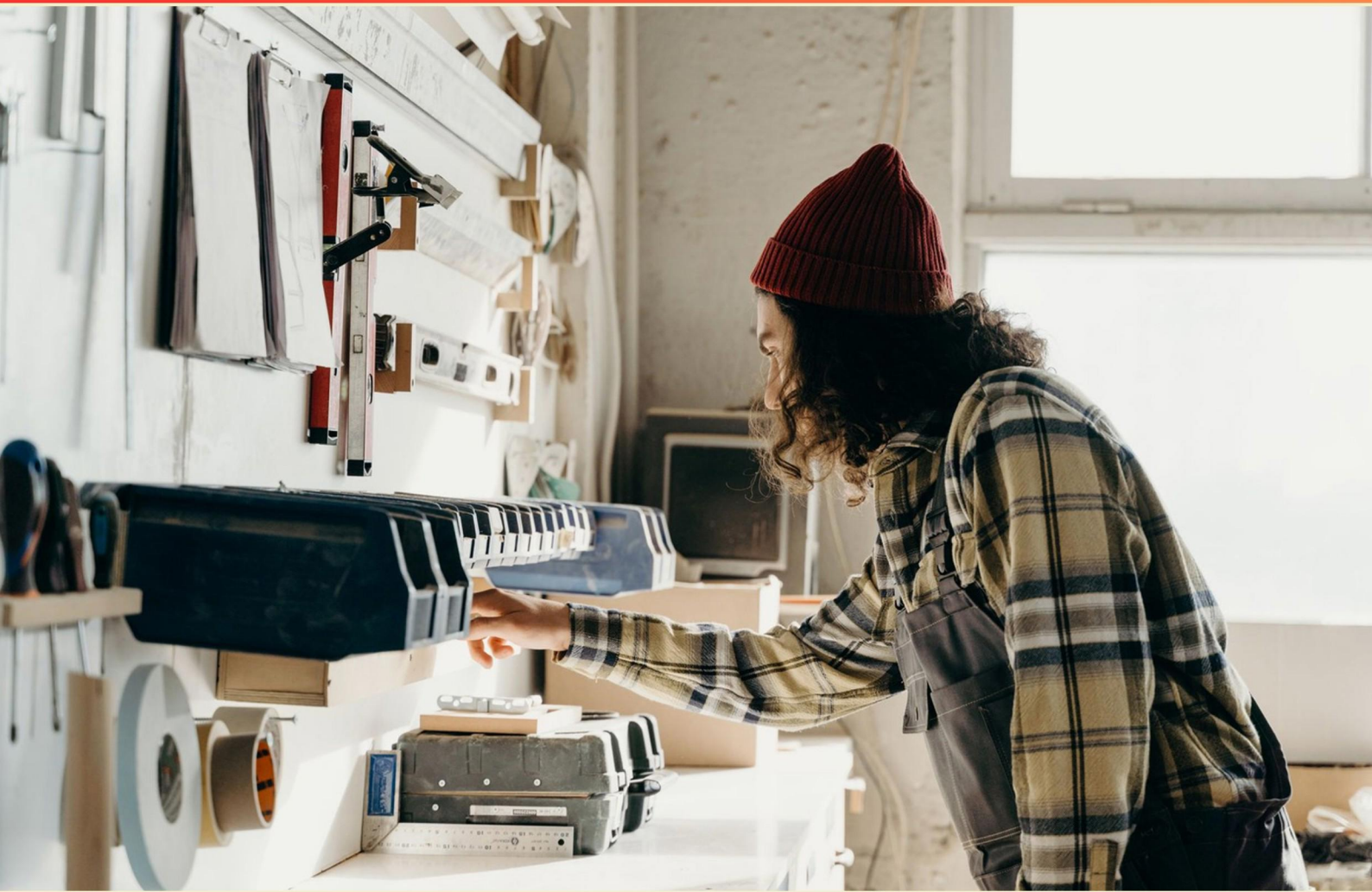


REFRIGERATION AND AIR CONDITIONING MECHANICS (313A) ADVANCED PRACTICE EXAM (SAMPLE) STUDY GUIDE



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 the formula for net oil pressure?**
 - A. Oil pump discharge + crankcase pressure
 - B. Oil pump discharge - crankcase pressure
 - C. Crankcase pressure - oil pump pressure
 - D. Crankcase pressure + oil pump pressure
- 2. What happens in the system of an air cooled condensing unit located in an unheated basement during the winter?**
 - A. The refrigerant condenses in the compressor
 - B. The compressor overheats
 - C. The system operates normally
 - D. The evaporator freezes
- 3. What unit of measurement is commonly used to express the oil pressure for a forced lubrication system?**
 - A. Psi
 - B. Bar
 - C. Pascal
 - D. Atmosphere
- 4. What component in an air conditioning system is responsible for absorbing heat from the inside air?**
 - A. Condenser
 - B. Evaporator
 - C. Compressor
 - D. Expansion valve
- 5. If a pneumatic mixing valve has a tear in the air side diaphragm, what will happen to the position of the mixing valve?**
 - A. The valve will close
 - B. The valve will open
 - C. The valve will freeze
 - D. The valve will stay at a constant position

- 6. Which combination of conditions promotes refrigerant migration to the compressor crankcase?**
- A. High temperature, low pressure
 - B. Low temperature, high pressure
 - C. Normal temperature, normal pressure
 - D. High temperature, high pressure
- 7. What is the result of a dirty condenser when paired with a propeller fan?**
- A. Static pressure will decrease
 - B. Static pressure will remain the same
 - C. Static pressure will increase
 - D. Air temperature will drop
- 8. Where is flux applied when silver brazing?**
- A. At the joint between two pipes
 - B. On the male part
 - C. Inside the female part
 - D. On the oxygen supply line
- 9. Which factor is critical when selecting refrigerants in terms of environmental impact?**
- A. Cost effectiveness
 - B. Ozone depletion potential
 - C. Compatibility with system materials
 - D. Thermal conductivity
- 10. Static electricity in computer and data processing rooms is usually caused by what factor?**
- A. High humidity
 - B. Low humidity
 - C. Insufficient air flow
 - D. Overheating equipment

Answers

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

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Explanations

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1. What is the formula for net oil pressure?

- A. Oil pump discharge + crankcase pressure
- B. Oil pump discharge - crankcase pressure**
- C. Crankcase pressure - oil pump pressure
- D. Crankcase pressure + oil pump pressure

Net oil pressure is defined as the effective pressure available to circulate oil through a system, especially in mechanical applications like engines or compressors. To calculate net oil pressure, you take the pressure generated by the oil pump and subtract the pressure in the crankcase. This is because the crankcase pressure can act as a counteracting force to the oil pump's output pressure. Therefore, by subtracting the crankcase pressure from the oil pump discharge pressure, you determine how much effective pressure is actually available for oil circulation. This is critical for ensuring adequate lubrication and cooling within the system, which helps to maintain optimal operational conditions and prevent potential damage to components. In summary, net oil pressure is the result of subtracting crankcase pressure from the discharge pressure of the oil pump. This relationship ensures that you are accounting for any resistance that the crankcase might impose on the oil flow provided by the pump.

2. What happens in the system of an air cooled condensing unit located in an unheated basement during the winter?

- A. The refrigerant condenses in the compressor**
- B. The compressor overheats
- C. The system operates normally
- D. The evaporator freezes

In an air-cooled condensing unit, the operation relies on the ambient temperature to help dissipate heat from the refrigerant as it flows through the condenser coils. When this unit is located in an unheated basement during the winter, the surrounding air temperature is typically much lower than the temperature of the refrigerant in the system. As the refrigerant enters the condenser, it needs to condense from a vapor to a liquid. If the ambient temperature is too low, the refrigerant may not lose enough heat to condense properly. Instead, it stays in a vapor state, which can lead to a situation where the refrigerant doesn't condense effectively and may return to the compressor as vapor. This can create a scenario where the refrigerant condenses in the compressor, which is abnormal and can lead to various issues, including damage to the compressor due to liquid slugging. Therefore, understanding the implications of low ambient temperatures on the operation of the air-cooled condensing unit is crucial, as it directly affects the phase change of the refrigerant within the system.

3. What unit of measurement is commonly used to express the oil pressure for a forced lubrication system?

- A. Psi**
- B. Bar
- C. Pascal
- D. Atmosphere

The commonly used unit of measurement to express oil pressure in a forced lubrication system is psi (pounds per square inch). This unit is particularly prevalent in the United States and is favored in many mechanical applications, including refrigeration and air conditioning systems. Oil pressure is critical for ensuring that lubricating oil is delivered effectively to all moving parts of machinery, minimizing wear and preventing overheating. Using psi allows technicians and mechanics to quickly assess whether the oil pressure is within the normal operating range, as the specifications for equipment usually reference this unit. Other units such as bar, pascal, and atmosphere are valid measures of pressure but are less frequently utilized in the context of forced lubrication systems in North America. Bar is more common in European applications, while pascal is a SI unit that, though widely used in scientific contexts, is typically not the standard for automotive or machinery oil pressure measurements. Atmosphere may be used in specific applications, but it is not standard for oil pressure in forced lubrication systems.

4. What component in an air conditioning system is responsible for absorbing heat from the inside air?

- A. Condenser
- B. Evaporator**
- C. Compressor
- D. Expansion valve

The component responsible for absorbing heat from the inside air in an air conditioning system is the evaporator. The evaporator functions by providing a surface where the refrigerant evaporates as it absorbs heat from the indoor air. As the indoor air circulates over the evaporator coils, the refrigerant within the coils changes from a liquid state to a gas state. This phase change allows the refrigerant to absorb heat effectively, cooling the air that is then circulated back into the living space. In contrast, the condenser is located outside and is responsible for releasing the heat absorbed by the refrigerant to the outside environment. The compressor serves to move the refrigerant through the system and maintain pressure levels, while the expansion valve regulates the flow of refrigerant into the evaporator, helping to control its pressure and temperature. Understanding the role of each component helps clarify how the air conditioning system operates as a whole, focusing specifically on the evaporator's function of heat absorption.

5. If a pneumatic mixing valve has a tear in the air side diaphragm, what will happen to the position of the mixing valve?

- A. The valve will close
- B. The valve will open**
- C. The valve will freeze
- D. The valve will stay at a constant position

When there is a tear in the air side diaphragm of a pneumatic mixing valve, it negatively impacts the ability of the valve to respond correctly to control signals. The diaphragm is crucial for translating pressure signals into mechanical movement; if it is compromised, the valve's ability to hold or adjust its position becomes erratic. With a tear in the diaphragm, the pressure that is needed to control the valve position can be lost or become unstable. Typically, this would mean that air pressure from the control mechanism might not be effectively pushing against the other side of the diaphragm, leading the valve to move towards the default position. In many cases, this default or failed position is fully open because that is often the result when there is insufficient control pressure to maintain a closed position. Therefore, as air pressure is not counterbalanced effectively on the diaphragm, this results in the valve inadvertently moving to the open position. Thus, the correct answer is that the valve will open as it fails to maintain a controlled position due to the damage to the diaphragm.

6. Which combination of conditions promotes refrigerant migration to the compressor crankcase?

- A. High temperature, low pressure
- B. Low temperature, high pressure**
- C. Normal temperature, normal pressure
- D. High temperature, high pressure

The combination of low temperature and high pressure is the condition that promotes refrigerant migration to the compressor crankcase. In refrigeration systems, refrigerant migration occurs when refrigerant flows out of the evaporator and accumulates in the compressor crankcase, which can lead to compressor inefficiency or damage. When the temperature in the system is low, the refrigerant in the evaporator tends to condense, and if the pressure is high, the refrigerant will not vaporize easily. As a result, excess refrigerant in the form of liquid can migrate to the compressor crankcase, especially when the system is off or during low load conditions. This can happen because the high pressure in the compressor creates a scenario where the refrigerant is more likely to compress and condense further in the crankcase at lower temperatures. Understanding these conditions is crucial for HVAC technicians to ensure that systems operate efficiently and prevent damage to the compressor.

7. What is the result of a dirty condenser when paired with a propeller fan?

- A. Static pressure will decrease
- B. Static pressure will remain the same
- C. Static pressure will increase**
- D. Air temperature will drop

A dirty condenser can significantly impact the efficiency of the heat exchange process, particularly when paired with a propeller fan. When the condenser is dirty, it creates resistance to airflow. This resistance hinders the effective transfer of heat from the refrigerant to the ambient air, which causes the fan to work harder to maintain airflow through the condenser coils. As a result of the increased airflow resistance due to dirt and debris accumulation, static pressure in the condenser unit actually increases. The dirt obstructs the airflow path, causing the fan to generate higher pressure in an attempt to push air through the condenser fins. This increase in static pressure signifies that the system is facing additional challenges in moving air, which compromises the overall effectiveness of the condenser and may lead to higher discharge temperatures of the refrigerant. The other options do not accurately represent the dynamics of a dirty condenser with a propeller fan, as they fail to consider the increased resistance caused by dirt buildup and its effect on airflow and pressure within the system. The important takeaway is that maintaining the cleanliness of the condenser is crucial for optimal system performance and efficiency.

8. Where is flux applied when silver brazing?

- A. At the joint between two pipes
- B. On the male part**
- C. Inside the female part
- D. On the oxygen supply line

The appropriate application of flux during silver brazing is critical for ensuring a proper bond between the base metals. Flux is used to prevent oxidation and facilitate the flow of the brazing filler metal. When considering silver brazing, it is essential to apply the flux to the male part of the joint. This is because the male fitting typically has more surface area that can benefit from the protective qualities of the flux. Applying flux on the male part also helps to promote better wetting of the brazing alloy, allowing it to flow effectively into the joint when heat is applied. The flux serves to clean the surfaces at the joint and, rather than just protecting the surface, it acts as an intermediary that aids in the complete heating and bonding process, creating a strong and durable joint. Applying flux incorrectly, such as on the oxygen supply line or solely on the female fitting, may not yield the desired results for a successful brazed joint, as it would limit the effectiveness of the process by not ensuring the right surfaces are treated to support proper adhesion and flow of the brazing filler.

9. Which factor is critical when selecting refrigerants in terms of environmental impact?

- A. Cost effectiveness
- B. Ozone depletion potential**
- C. Compatibility with system materials
- D. Thermal conductivity

When selecting refrigerants, ozone depletion potential (ODP) is a critical factor because it quantifies the ability of a substance to contribute to the degradation of the ozone layer, which protects the Earth from harmful ultraviolet (UV) radiation. Refrigerants with high ODP contribute significantly to ozone layer depletion, which can lead to increased UV exposure and its associated environmental and health risks, such as skin cancer and ecological damage. Regulatory bodies and environmental policies increasingly prioritize the use of refrigerants with low or zero ozone depletion potential, encouraging the transition to alternatives that minimize adverse impacts on the environment. Choosing refrigerants that have minimal or no ozone-depleting effects is essential for maintaining sustainable practices in refrigeration and air conditioning. While other factors such as cost effectiveness, compatibility with system materials, and thermal conductivity are also important in the selection process, they do not directly address environmental concerns in the same way that ozone depletion potential does. Therefore, ODP is a primary criterion when considering the environmental impact of refrigerants.

10. Static electricity in computer and data processing rooms is usually caused by what factor?

- A. High humidity
- B. Low humidity**
- C. Insufficient air flow
- D. Overheating equipment

Static electricity in computer and data processing rooms is primarily caused by low humidity. In dry environments, particularly where humidity levels drop significantly, the air cannot effectively conduct electrical charges. This enables static charges to build up on surfaces, including electronic equipment and people's bodies, creating a higher risk of electrostatic discharge (ESD) that can damage sensitive components. Humidity levels above 40% are generally recommended to help mitigate the buildup of static electricity. When humidity is high, moisture in the air can help dissipate electrical charges by providing a conductive pathway, thus reducing the chances of static buildup. This is particularly crucial in environments with sensitive electronic equipment, where even minor static discharges can lead to malfunctions or damage. Factors like insufficient airflow and overheating equipment may contribute to other types of problems in data processing rooms, such as thermal management issues, but they do not directly impact static electricity generation in the same way that humidity does. Therefore, low humidity stands out as the critical factor for static electricity concerns in these settings.

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://313aadvanced.examzify.com>

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

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