RSI Phase 8 Practice Test (Sample)

Study Guide

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Questions

1. A multimeter showing 31 ohms when checking the resistance of a compressor start winding indicates what?

A. The winding has continuity and is good

B. The winding is shorted

C. The winding is open

D. The winding is overheating

2. What should be used to size the power wire for air conditioning equipment?

A. The maximum load capacity

B. The minimum circuit ampacity listed on the equipment dataplate

C. The total circuit length

D. The local electrical code requirements

3. Why is it recommended that an acetylene cylinder valve never be opened more than 1/2 turn?

A. To allow for continuous flow of gas

B. To allow rapid shutoff in the case of an accident

C. To prevent gas leakage

D. To ensure maximum pressure

4. What type of compressors are used in protocol refrigeration systems?

A. Reciprocating

B. Scroll

C. Rotary

D. Vortex

5. Compared to a traditional rack system, what is a distinguishing feature of a protocol system?

A. Has more refrigerant piping

B. Utilizes advanced technology

C. Is quieter in operation

D. Has less refrigerant piping

6. What advantage do glass door frozen food cases have over open display frozen food cases?

- **A. Lower initial cost**
- **B. More energy efficient**
- **C. More product visibility**
- **D. Easier access for customers**

7. How is defrost normally accomplished in a low temperature case?

- **A. By running the compressor at a lower setting**
- **B. By shutting off the compressor and energizing electric defrost heaters**
- **C. By increasing the refrigeration cycle**
- **D. By using warm air from the environment**

8. Why are the stubs on a compressor and filter driers more difficult to braze than copper pipe?

- **A. They are thicker than copper pipes**
- **B. They have a thin copper coating that is easily oxidized by overheating**
- **C. They are made of a different metal**
- **D. They are designed for quick connections**

9. A common use for absorption refrigeration is in?

- **A. The refrigerators of recreational vehicles**
- **B. Commercial cold storage facilities**
- **C. Industrial ice-making plants**
- **D. Home air conditioning systems**

10. Why is it illegal to operate a torch with an acetylene pressure greater than 15psi?

- **A. It becomes more difficult to control**
- **B. Acetylene becomes unstable and can explode above 15psi**
- **C. It increases the risk of gas leakage**
- **D. It reduces the efficiency of combustion**

Answers

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

Explanations

1. A multimeter showing 31 ohms when checking the resistance of a compressor start winding indicates what?

A. The winding has continuity and is good

B. The winding is shorted

C. The winding is open

D. The winding is overheating

A multimeter reading of 31 ohms when checking the resistance of a compressor start winding indicates that the winding has continuity and is functioning properly. In electrical circuits, continuity refers to the presence of a complete path for current to flow. A measurable resistance value like 31 ohms suggests that the winding is intact and not broken, which is essential for proper operation. Values for resistance in electric motor windings can vary based on design, but a 31-ohm measurement typically indicates a good condition under normal circumstances, as it shows that the winding is not open (which would indicate infinite resistance) or shorted (which would typically have a value close to zero ohms). Hence, the resistance reading confirms the winding's integrity, allowing it to operate effectively in the compressor. Winding issues such as overheating or shorting typically present themselves with more extreme resistance values, while an open winding would result in an infinite reading.

2. What should be used to size the power wire for air conditioning equipment?

A. The maximum load capacity

B. The minimum circuit ampacity listed on the equipment dataplate

C. The total circuit length

D. The local electrical code requirements

Sizing the power wire for air conditioning equipment is fundamentally dependent on the minimum circuit ampacity listed on the equipment dataplate. This specification indicates the minimum required wire size needed to safely carry the electrical load necessary for the air conditioning unit to operate efficiently and safely. By referring to the dataplate, technicians ensure that the wire can handle the electrical demands of the system, thereby reducing the risk of overheating, voltage drop, and other potential issues that may arise from using an improperly sized wire. The minimum circuit ampacity is specifically designed to accommodate the operational characteristics of the equipment, taking into consideration factors such as continuous load ratings and safety margins. Local electrical code requirements may influence wire sizing based on various regulations, but the dataplate provides the manufacturer's recommendations crucial for maintaining the equipment's performance and safety. Other influences like the maximum load capacity or total circuit length are important considerations for overall system design but do not take precedence over the manufacturer's specified minimum circuit ampacity when sizing the power wire directly.

3. Why is it recommended that an acetylene cylinder valve never be opened more than 1/2 turn?

A. To allow for continuous flow of gas

B. To allow rapid shutoff in the case of an accident

C. To prevent gas leakage

D. To ensure maximum pressure

The recommendation to open an acetylene cylinder valve no more than 1/2 turn is primarily for safety reasons, particularly to allow for rapid shutoff in case of an accident. In an emergency situation, such as a fire or a gas leak, the ability to quickly close the valve can be critical in preventing the escape of hazardous gas and minimizing the risk of a dangerous situation escalating. When the valve is opened only halfway, it provides a balance between maintaining the necessary flow of gas for use in applications such as welding or cutting while ensuring that the operator can swiftly shut off the gas supply if needed. This precaution is especially important since acetylene is highly flammable and poses a significant risk if mishandled. Other options, while relevant to gas usage, do not pertain specifically to the safety aspect emphasized by the 1/2 turn guideline. For instance, continuous flow of gas and maximum pressure are important in specific contexts, but they don't prioritize the essential safety feature that allows for immediate shutoff in emergencies. Preventing gas leakage is a concern as well, but the design of the valve and the proper handling procedures are typically more focused on safety and rapid response than on leakage prevention for a non-fully opened valve.

4. What type of compressors are used in protocol refrigeration systems?

A. Reciprocating

B. Scroll

C. Rotary

D. Vortex

The use of scroll compressors in protocol refrigeration systems is rooted in their efficiency and performance characteristics. Scroll compressors operate using two interleaved spiral-shaped components, which compress the refrigerant as it is drawn into the spiral pockets formed by these components. This design results in continuous compression cycles, leading to smoother operation, lower noise levels, and reduced energy consumption compared to other types of compressors. In protocol refrigeration systems, which often require precise temperature control and reliability, the advantages of scroll compressors become particularly valuable. Their ability to operate efficiently across a range of operating conditions makes them ideal for handling varying loads commonly encountered in refrigeration applications. While reciprocating and rotary compressors are also used in various refrigeration settings, they do not typically provide the same level of energy efficiency and operational smoothness as scroll compressors. Vortex compressors, on the other hand, are less common and not standard in refrigeration applications, making scroll compressors the more suitable choice for protocol refrigeration systems.

5. Compared to a traditional rack system, what is a distinguishing feature of a protocol system?

A. Has more refrigerant piping

B. Utilizes advanced technology

C. Is quieter in operation

D. Has less refrigerant piping

A distinguishing feature of a protocol system, when compared to a traditional rack system, is that it typically has less refrigerant piping. This is often due to the design efficiency and configuration of protocol systems, which are engineered to streamline the cooling process. By reducing the amount of refrigerant piping, these systems can offer more straightforward installation and maintenance, as well as improved energy efficiency. In contrast, traditional rack systems may require more extensive piping networks due to their larger scale and the way refrigerants are distributed across multiple units. The use of less refrigerant piping in protocol systems also helps in minimizing potential points of failure, leading to enhanced reliability and performance. Overall, the reduction in refrigerant piping is a significant factor that helps distinguish protocol systems from traditional rack systems, leading to operational benefits and efficiencies.

6. What advantage do glass door frozen food cases have over open display frozen food cases?

A. Lower initial cost

B. More energy efficient

C. More product visibility

D. Easier access for customers

The advantage of glass door frozen food cases over open display frozen food cases lies in their greater energy efficiency. Glass doors help maintain a stable internal temperature by minimizing the amount of warm air that enters the unit when customers open the door. This design reduces the workload on the refrigeration system, leading to lower energy consumption and more efficient operation. By keeping the cold air contained, these cases are better at preserving the quality of the frozen foods within and at maintaining optimal energy use. In contrast, open display cases allow for more air exchange, which results in increased energy costs and less efficient refrigeration performance. While other factors, such as product visibility and accessibility, may differ, the significant energy efficiency offered by glass door cases is a key advantage.

7. How is defrost normally accomplished in a low temperature case?

A. By running the compressor at a lower setting

B. By shutting off the compressor and energizing electric defrost heaters

C. By increasing the refrigeration cycle

D. By using warm air from the environment

Defrost in a low-temperature case is typically accomplished by shutting off the compressor and energizing electric defrost heaters. This method is effective because it allows for the removal of ice and frost that can accumulate on the evaporator coils during normal operation. The frost buildup can hinder the efficiency of the refrigeration system, reducing its ability to maintain low temperatures. By turning off the compressor, the refrigeration cycle is paused, and the electric heaters provide heat directly to the coils. This heat melts the frost, which then drains away as water, clearing the coil surfaces for optimal airflow and heat exchange once the compressor is turned back on. This process ensures a return to normal operation without damaging components or significantly impacting stored products. The other options do not effectively address the defrosting issue. Running the compressor at a lower setting or increasing the refrigeration cycle may not adequately remove the frost and would likely exacerbate the problem. Using warm air from the environment is not a controlled method and could lead to inconsistent temperatures within the case, potentially jeopardizing the integrity of the stored items.

8. Why are the stubs on a compressor and filter driers more difficult to braze than copper pipe?

A. They are thicker than copper pipes

B. They have a thin copper coating that is easily oxidized by overheating

C. They are made of a different metal

D. They are designed for quick connections

The correct answer points to the fact that stubs on a compressor and filter driers have a thin copper coating that is particularly susceptible to oxidation when exposed to excessive heat during the brazing process. This oxidizing effect occurs because when the copper coating is overheated, it can create a layer of oxide that impedes proper adhesion and flow of the brazing material. Additionally, the oxidation can weaken the integrity of the joint, leading to potential leaks in the refrigeration system. While other options might suggest various physical attributes or design factors, they do not capture the specific challenge posed by the coating's reaction to heat. For instance, the suggestion that stubs are thicker than copper pipes does not accurately reflect how thickness directly impacts the brazing process itself; rather, it is more the material composition and its behavior at high temperatures that is critical in this scenario.

9. A common use for absorption refrigeration is in?

A. The refrigerators of recreational vehicles

B. Commercial cold storage facilities

C. Industrial ice-making plants

D. Home air conditioning systems

Absorption refrigeration is commonly used in recreational vehicles because it operates efficiently without the need for electricity, making it ideal for mobile living environments where power sources may be limited. This system uses a heat source, such as propane or natural gas, to drive the refrigeration cycle. In a recreational vehicle, absorption refrigerators can run off the vehicle's gas supply, providing reliable cooling for food and beverages while traveling or camping. While other options, such as commercial cold storage facilities, industrial ice-making plants, and home air conditioning systems, may utilize various refrigeration technologies, they typically rely on vapor-compression systems rather than absorption. Absorption systems are not as suited for applications where high efficiency and rapid cooling are critical, which explains why they are less commonly employed in those contexts.

10. Why is it illegal to operate a torch with an acetylene pressure greater than 15psi?

A. It becomes more difficult to control

B. Acetylene becomes unstable and can explode above 15psi

C. It increases the risk of gas leakage

D. It reduces the efficiency of combustion

Operating a torch with acetylene at a pressure greater than 15 psi is illegal primarily because acetylene becomes unstable and can pose a significant risk of explosion at higher pressures. Acetylene is a highly flammable gas, and when pressurized beyond this limit, its molecular structure can lead to a hazardous situation where the gas may decompose explosively. This instability can create dangerous conditions, making it critical to adhere to safety guidelines that limit the pressure to ensure safe operation. While other aspects, such as control difficulties and gas leakage, may be concerns at higher pressures, the fundamental reason for this regulation is the inherent instability of acetylene above 15 psi, which directly relates to safety and the prevention of potentially catastrophic incidents.