FDNY CoF – Supervision of Fire Alarm Systems (Q-01) Practice Test (Sample)

Study Guide

BY EXAMZIFY

Everything you need from our exam experts!

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

Questions

1. Which of the following is NOT a design factor affecting compressor capacity?

A. Compressor speed

B. Clearance space

C. Piston displacement

D. Suction and discharge valve designs

2. In a refrigeration system, what is the purpose of a TXV sensor bulb?

A. To measure superheat

B. To control refrigerant flow

C. To monitor system pressure

D. To detect refrigerant leaks

3. In a lithium bromide absorption system, what is the lowest possible temperature that can leave the evaporator?

A. 31 F

B. 33 F

C. 35 F

D. 38 F

4. What is a common consequence of moisture in a refrigeration system?

A. Decreased efficiency

B. Increased pressure

C. Increased cooling capacity

D. Enhanced operation

5. How can refrigerant properties be classified?

A. Thermodynamic and chemical

B. Thermodynamic and physical

C. Physical and mechanical

D. Chemical and environmental

6. How many pounds are in one gallon of water?

- **A. 7.5 lbs**
- **B. 8.33 lbs**
- **C. 9.0 lbs**
- **D. 10.0 lbs**

7. If brine becomes saturated with ammonia in a small compression plant, what should you do?

- **A. Run the brine through the cooling tower and treat it with lime.**
- **B. Treat the brine with lime.**
- **C. Run it to the sewer and make a new batch.**
- **D. Pay no attention to the problem since it will correct itself.**

8. How many breathing apparatus masks are needed for 1,001-2,000 lbs. of refrigerant?

- **A. 1 mask**
- **B. 2 masks**
- **C. 3 masks**
- **D. No masks required**

9. What is the consequence of not following hydrostatic testing dates on refrigerant cylinders?

- **A. Increased efficiency**
- **B. Risk of failure**
- **C. Higher operational costs**
- **D. Compliance with regulations**

10. If a piece of equipment can be isolated, what must be installed as a safety measure?

- **A. A safety gauge must be present**
- **B. A safety valve must be installed**
- **C. Valves must be locked**
- **D. The system must be able to run without it**

Answers

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

Explanations

1. Which of the following is NOT a design factor affecting compressor capacity?

A. Compressor speed

B. Clearance space

C. Piston displacement

D. Suction and discharge valve designs

Compressor speed is indeed a key factor affecting the performance of a compressor, including its capacity. The capacity of a compressor can vary with the speed at which it operates; higher speeds generally increase the volume of gas being compressed and, therefore, increase capacity. However, compressor speed is not typically classified as a design factor in the same way that the other options are. Design factors relate more directly to the physical characteristics and configuration of the compressor itself, influencing its operational capabilities. Clearance space, for instance, affects the efficiency and volume that can be compressed within the cylinder. Piston displacement directly determines the amount of fluid the compressor can move per cycle, while suction and discharge valve designs impact how well the compressor can intake and exhaust gas, affecting overall performance and efficiency. Thus, while compressor speed influences capacity, it doesn't fall into the category of design factors like the other choices do, which are inherent design specifications affecting the compressor's functioning.

2. In a refrigeration system, what is the purpose of a TXV sensor bulb?

A. To measure superheat

B. To control refrigerant flow

C. To monitor system pressure

D. To detect refrigerant leaks

The purpose of a TXV (Thermal Expansion Valve) sensor bulb is to measure superheat in a refrigeration system. When refrigerant flows through the evaporator coil, it absorbs heat and changes from a liquid to a vapor. The superheat is the additional heat that the refrigerant vapor has gained above the temperature at which it would begin to condense back into a liquid. The TXV sensor bulb is filled with a gas that expands and contracts in response to the temperature of the refrigerant vapor leaving the evaporator. This change in pressure within the bulb allows the TXV to adjust the flow of refrigerant into the evaporator based on the measured superheat. By controlling the refrigerant flow to maintain the proper superheat level, the TXV ensures efficient system operation, preventing issues such as liquid refrigerant returning to the compressor which could cause damage. The other options focus on different functions within a refrigeration system: controlling refrigerant flow is a result of the sensor bulb's measurement; monitoring system pressure involves components like pressure switches or gauges, and detecting refrigerant leaks typically requires specialized detection equipment, rather than the TXV sensor bulb.

3. In a lithium bromide absorption system, what is the lowest possible temperature that can leave the evaporator?

- A. 31 F
- B. 33 F
- C. 35 F
- D. 38 F

In a lithium bromide absorption system, the temperature leaving the evaporator is closely tied to the refrigerant properties and the overall effectiveness of the system. The absorption cycle uses water as the refrigerant, which evaporates in the evaporator to absorb heat from the surroundings. The typical minimum temperature that can be achieved in the evaporator is influenced by both the refrigerant properties and the system's operational conditions. Water, as a refrigerant in this context, cannot evaporate below its freezing point without risk of freezing. Therefore, for practical applications in a lithium bromide absorption system, the evaporator typically operates around or above a temperature of 38 F due to these limits. Operating below this range can lead to inefficiencies or potential operational issues due to freezing or improper heat exchange. Consequently, 38 F is recognized as the lowest effective temperature that can efficiently leave the evaporator without compromising the system's operational integrity.

4. What is a common consequence of moisture in a refrigeration system?

- A. Decreased efficiency
- B. Increased pressure
- C. Increased cooling capacity
- D. Enhanced operation

Moisture in a refrigeration system typically leads to decreased efficiency. When moisture enters the system, it can cause a number of problems, including the formation of ice within the evaporator or other components. This ice can obstruct proper airflow and lead to a decline in the system’s ability to cool effectively. Additionally, moisture can react with refrigerants, forming acids that can corrode components and create further inefficiencies. As a result, the overall performance of the refrigeration system diminishes, leading to higher energy consumption and increased operational costs. The other options do not accurately reflect the consequences of moisture in a refrigeration system. Increased pressure is a potential concern, but the primary effect is inefficiency rather than a straightforward increase in pressure. Increased cooling capacity and enhanced operation are both outcomes that would be contrary to the effect of moisture, as moisture disrupts the optimal functioning of the system rather than improving it.

5. How can refrigerant properties be classified?

A. Thermodynamic and chemical

B. Thermodynamic and physical

C. Physical and mechanical

D. Chemical and environmental

Refrigerants can be classified based on their thermodynamic and physical properties. Thermodynamic properties refer to how refrigerants behave in terms of heat transfer and energy transfer during the refrigeration cycle. This includes characteristics such as boiling point, pressure characteristics, and enthalpy, which are essential for understanding how a refrigerant will perform in specific applications. Physical properties encompass aspects such as density, viscosity, and thermal conductivity. These properties are crucial in determining how refrigerants interact with the components of refrigeration systems, such as compressors and evaporators. Understanding these classifications allows engineers and technicians to choose the appropriate refrigerants for various applications, ensuring efficiency and safety in refrigeration and cooling systems.

6. How many pounds are in one gallon of water?

A. 7.5 lbs

B. 8.33 lbs

C. 9.0 lbs

D. 10.0 lbs

One gallon of water weighs approximately 8.33 pounds at room temperature. This specific weight is based on the density of water, which is about 8.33 pounds per gallon. The weight can vary slightly with changes in temperature and impurities in the water, but for practical purposes, 8.33 pounds is the standard conversion used in many scientific and engineering contexts. This value is crucial for calculations involving fluid dynamics, firefighting, and other applications where accurate weight measurements of water are necessary. Understanding this conversion is essential for tasks that involve volumes and weights, such as developing fire suppression systems and analyzing water flow in firefighting scenarios.

7. If brine becomes saturated with ammonia in a small compression plant, what should you do?

- A. Run the brine through the cooling tower and treat it with lime.
- B. Treat the brine with lime.
- C. Run it to the sewer and make a new batch.
- D. Pay no attention to the problem since it will correct itself.

If brine becomes saturated with ammonia in a small compression plant, the appropriate course of action is to run it to the sewer and make a new batch. This choice is correct because allowing the brine to remain saturated with ammonia can lead to a range of operational and environmental issues. Saturation indicates that the brine has reached its maximum capacity for ammonia, which could result in reduced performance in the cooling process or may potentially overheat equipment and cause corrosion. By diverting the brine to the sewer, you effectively eliminate the concentration of ammonia that could hinder operational efficiency and compliance with environmental regulations. Making a new batch allows you to maintain the proper chemical balance necessary for optimal functioning of the system. The other options, while they may offer some treatment alternatives, do not effectively address the immediate saturation problem. Running brine through a cooling tower or treating it with lime can manage ammonia levels, but such methods may not be sufficient to resolve the saturation issue thoroughly. In the case of ensuring the integrity and safety of the system, making a fresh batch is the most reliable solution.

8. How many breathing apparatus masks are needed for 1,001-2,000 lbs. of refrigerant?

- A. 1 mask
- B. 2 masks
- C. 3 masks
- D. No masks required

For a quantity of refrigerant between 1,001 and 2,000 lbs., two breathing apparatus masks are required. This requirement is based on safety regulations that dictate the necessary personal protective equipment (PPE) needed when handling large amounts of refrigerants, which can be hazardous in the event of a leak or release. Refrigerants can displace oxygen in the air or be toxic, necessitating the use of appropriate respiratory protection. The determination of this number is calculated to ensure that adequate safety measures are in place to protect workers from potential exposure, as one mask may not suffice. Therefore, the regulation ensures that personnel have the equipment necessary for two individuals, thus enhancing safety protocols during operations involving significant quantities of refrigerant.

9. What is the consequence of not following hydrostatic testing dates on refrigerant cylinders?

A. Increased efficiency

B. Risk of failure

C. Higher operational costs

D. Compliance with regulations

The consequence of not following hydrostatic testing dates on refrigerant cylinders is primarily a risk of failure. Hydrostatic testing is essential for ensuring the integrity and safety of the cylinders that contain pressurized refrigerants. Over time, materials can degrade or develop weaknesses that may not be visible externally. If these cylinders are not tested periodically as required, they may be at risk of rupturing or leaking, which can lead to a hazardous situation, including potential injuries, property damage, and environmental contamination. Regular hydrostatic testing verifies that the cylinder can withstand the pressures for which it is designed. Without this testing, users expose themselves to the potential of catastrophic failures that could result from compromised cylinder integrity. Ensuring compliance with testing schedules is crucial in maintaining safe operation standards and protecting both individuals and the environment.

10. If a piece of equipment can be isolated, what must be installed as a safety measure?

A. A safety gauge must be present

B. A safety valve must be installed

C. Valves must be locked

D. The system must be able to run without it

When a piece of equipment can be isolated, installing a safety valve is essential as a precautionary measure. A safety valve is designed to prevent overpressure situations that can lead to equipment failure or hazardous conditions. It serves as a critical component in maintaining safe operational parameters. By ensuring that a safety valve is in place, it allows for the safe venting of excess pressure, thereby protecting personnel and property from potential dangers associated with the isolated equipment. This necessity arises from safety regulations that mandate protective measures for equipment that can be taken offline or has parts that can operate independently. In this context, while safety gauges and locked valves play roles in various safety protocols, they do not directly address the need for immediate pressure relief in the event of isolation. The system's ability to run without the piece of equipment is not a sufficient safety measure by itself. Therefore, the installation of a safety valve is crucial in ensuring overall system integrity and safety when isolation occurs.