ASSE Backflow Recertification Practice Exam (Sample)

Study Guide

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Questions

1. **Which type of protection is associated with air gap separation?**
   - A. Backpressure
   - B. Backsiphonage
   - C. Both backpressure and backsiphonage
   - D. Vacuum breaker

2. **What classification would waste from a chemical plant typically fall into?**
   - A. Low hazard
   - B. Medium hazard
   - C. High hazard
   - D. Non-hazardous

3. **What is the primary purpose of pressure relief valves in backflow prevention assemblies?**
   - A. To secure the assembly during installation
   - B. To allow controlled discharge of water
   - C. To completely shut off water flow
   - D. To monitor water quality

4. **How many standard test cocks are present in a typical double check valve assembly?**
   - A. 2
   - B. 3
   - C. 4
   - D. 5

5. **In facilities using a contaminated auxiliary water supply for fire protection, what is required for the potable water service connection?**
   - A. Atmospheric vacuum breaker
   - B. Double check valve
   - C. Reduced Pressure Zone (RPZ)
   - D. Pressure vacuum breaker

6. What would a gauge installed at the bottom of a 10-foot deep open water tank indicate in terms of pressure?

A. 2.3 psi

B. 4.3 psi

C. 5.0 psi

D. 7.0 psi

7. A pressure of 75 psi is equivalent to how many feet of water head?

A. 100 feet

B. 173.25 feet

C. 200 feet

D. 150 feet

8. How high can atmospheric pressure at sea level support a column of water?

A. 25.5 feet

B. 33.9 feet

C. 40 feet

D. 50 feet

9. True or False: Contaminant devices should be installed at the service connection in high hazard facilities.

A. True

B. False

C. Only in low hazard facilities

D. Only when mandated by law

10. What type of backflow prevention is required for a closed-loop system that contains antifreeze?

A. Double check valve

B. Atmospheric vacuum breaker

C. Reduced Pressure Zone (RPZ)

D. None, as it is unnecessary

Answers

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

Explanations

1. Which type of protection is associated with air gap separation?

A. Backpressure

B. Backsiphonage

C. Both backpressure and backsiphonage

D. Vacuum breaker

The correct answer involves understanding the concept of an air gap separation and its role in backflow prevention. An air gap is a physical separation between a drinking water supply and the source of contamination. It is one of the most effective means of preventing both backsiphonage and backpressure situations. In cases of backsiphonage, a drop in pressure in the water system can cause contaminated water to be sucked back into the clean water supply. An air gap effectively prevents this by ensuring that there is no direct contact point for contamination to occur. Conversely, backpressure occurs when the pressure in the contaminated system exceeds that of the drinking water supply, which can lead to the contamination of the safe water system. The air gap, by maintaining a separation, prevents any backpressure from causing flow reversal into the potable supply. Thus, because the air gap separation serves as a protective measure against both scenarios, the choice that identifies its association with both backpressure and backsiphonage is the most accurate.

2. What classification would waste from a chemical plant typically fall into?

A. Low hazard

B. Medium hazard

C. High hazard

D. Non-hazardous

Waste from a chemical plant typically falls into the high hazard classification due to the potential dangers associated with the materials processed and produced within such facilities. Chemical plants often handle a variety of toxic substances, hazardous chemicals, and industrial waste that can pose significant risks to human health and the environment. High hazard waste includes materials that are corrosive, reactive, toxic, or otherwise harmful if released. Chemical plants may produce waste that can cause severe health risks, environmental contamination, or safety concerns if not managed properly. The handling and disposal of such waste require strict adherence to regulations and best practices to mitigate risks associated with exposure or accidental release, emphasizing the importance of proper backflow prevention measures to protect potable water supplies from potential contamination.

3. What is the primary purpose of pressure relief valves in backflow prevention assemblies?

A. To secure the assembly during installation

B. To allow controlled discharge of water

C. To completely shut off water flow

D. To monitor water quality

The primary purpose of pressure relief valves in backflow prevention assemblies is to allow controlled discharge of water. These valves play a crucial role in maintaining system pressure and ensuring safe operation. When excess pressure builds up within the assembly—due to factors such as thermal expansion or blockage—these valves open to release the excess pressure in a controlled manner. This not only protects the integrity of the backflow prevention assembly but also helps to prevent potential damage to pipes and connected systems. By allowing for this controlled discharge, the pressure relief valves ensure that the system operates efficiently while also mitigating the risks associated with overpressure situations, such as leaks or ruptures, thereby protecting both the plumbing infrastructure and the surrounding environment.

4. How many standard test cocks are present in a typical double check valve assembly?

A. 2

B. 3

C. 4

D. 5

A typical double check valve assembly includes four standard test cocks. These test cocks are essential for conducting performance tests of the double check valves. In a double check valve assembly, there are two main valve bodies, and each valve body is equipped with a test cock for testing the inlet side and the outlet side of each valve. Additionally, there is a test cock located between the two valves, which allows for testing of the shutoff features and ensuring the integrity of the assembly. The combination of these test cocks provides access points for backflow testing and maintenance, ensuring that the system is functioning properly and preventing any potential cross-connection contamination. Thus, the presence of four standard test cocks in a typical double check valve assembly is an established standard for maintaining the effectiveness of backflow prevention devices.

5. In facilities using a contaminated auxiliary water supply for fire protection, what is required for the potable water service connection?

A. Atmospheric vacuum breaker

B. Double check valve

C. Reduced Pressure Zone (RPZ)

D. Pressure vacuum breaker

In facilities that utilize a contaminated auxiliary water supply for fire protection, the connection to the potable water service needs to be safeguarded to prevent any potential backflow contamination. The use of a Reduced Pressure Zone (RPZ) assembly is specifically designed for this purpose. An RPZ consists of two check valves with a pressure differential relief valve located between them. This configuration not only prevents the backflow of contaminated water into the potable system but also maintains a constant pressure difference, which allows for automatic relief of any backpressure or backsiphonage conditions that might occur. This is essential in scenarios where there is a risk of contamination from an auxiliary water supply, as the RPZ effectively mitigates the dangers associated with varying pressure conditions, ensuring that potable water remains uncontaminated. The other options, while they may provide some level of protection, do not offer the comprehensive safety features of an RPZ in the context of backflow prevention where contaminated water supplies are involved. For example, an atmospheric vacuum breaker operates effectively in preventing back siphonage but not under continuous pressure conditions, and a double check valve may not provide sufficient protection against backpressure. Therefore, the use of a Reduced Pressure Zone assembly is the only option that meets the stringent requirements for protecting potable

6. What would a gauge installed at the bottom of a 10-foot deep open water tank indicate in terms of pressure?

A. 2.3 psi

B. 4.3 psi

C. 5.0 psi

D. 7.0 psi

To determine the pressure indicated by a gauge installed at the bottom of a 10-foot deep open water tank, one can use the hydrostatic pressure formula, which states that pressure at a certain depth is calculated by the equation: Pressure (in psi) = Depth (in feet) × 0.433 psi/foot. This conversion factor of 0.433 psi/foot reflects the weight of water. For a depth of 10 feet, the pressure can be calculated as follows: Pressure = 10 feet × 0.433 psi/foot = 4.33 psi. When rounded to one decimal place, this figure is approximately 4.3 psi, which aligns with the correct option provided. This outcome illustrates how hydrostatic pressure operates, showing that the deeper you go in a fluid, the greater the pressure due to the weight of the fluid above. Understanding this concept is essential for interpreting readings from pressure gauges accurately in various practical applications, especially within backflow prevention systems where pressure differentials can be critical.

7. A pressure of 75 psi is equivalent to how many feet of water head?

A. 100 feet

B. 173.25 feet

C. 200 feet

D. 150 feet

To convert pressure in psi to feet of water head, you use the conversion factor that 1 psi is approximately equal to 2.31 feet of water. This conversion is derived from the relationship between pressure, density, and gravitational force. Specifically, the formula used is: Feet of water head = psi x 2.31 In this case, using a pressure of 75 psi: 75 psi x 2.31 feet/psi = 173.25 feet This shows that the pressure of 75 psi corresponds to 173.25 feet of water head, making this the correct answer for the problem. Understanding this conversion is vital for applications in plumbing and backflow prevention, as it helps you interpret pressure readings in terms of water column height, which is more intuitive in many practical situations.

8. How high can atmospheric pressure at sea level support a column of water?

A. 25.5 feet

B. 33.9 feet

C. 40 feet

D. 50 feet

Atmospheric pressure at sea level can support a column of water to a height of approximately 33.9 feet. This phenomenon is due to the weight of the water being supported by the atmospheric pressure acting on the surface of the water. To put this into perspective, the standard atmospheric pressure at sea level is about 14.7 pounds per square inch, which can lift a column of mercury to a height of about 29.92 inches. Since water is less dense than mercury, the height to which water can be supported by the same atmospheric pressure is significantly greater. Specifically, the relationship between pressure, height, and the density of the fluid is described by the hydrostatic pressure equation: $P = \rho gh$, where P is pressure, ρ is the density of the fluid (water in this case), g is the acceleration due to gravity, and h is the height of the fluid column. When calculated, this leads to approximately 33.9 feet of water being supported by atmospheric pressure at sea level. This understanding is crucial in fields such as plumbing and backflow prevention, where knowing the capabilities of water pressure is essential for designing systems that safely manage liquid movement and prevent contamination.

9. True or False: Contaminant devices should be installed at the service connection in high hazard facilities.

A. True

B. False

C. Only in low hazard facilities

D. Only when mandated by law

The statement is true; contaminant devices should indeed be installed at the service connection in high hazard facilities. High hazard facilities are those where there is a significant risk of contaminants entering the drinking water supply due to the nature of their operations. This includes industrial sites, chemical plants, and facilities handling hazardous substances. The rationale for having contaminant devices at the service connection is to ensure that any potential backflow of contaminants does not reach the public water system. These devices are designed to prevent the reverse flow of contaminated water from the facility back into the potable water supply, safeguarding public health and complying with regulatory standards. In contrast, the claim that contaminant devices are only necessary in low hazard facilities, or that they should be implemented solely when mandated by law, undermines the crucial preventive measure these devices represent in high-risk situations. Hence, it is essential to prioritize the installation of these devices at service connections in environments where hazardous materials could potentially pollute water supplies.

10. What type of backflow prevention is required for a closed-loop system that contains antifreeze?

A. Double check valve

B. Atmospheric vacuum breaker

C. Reduced Pressure Zone (RPZ)

D. None, as it is unnecessary

The requirement for a Reduced Pressure Zone (RPZ) backflow prevention device in closed-loop systems containing antifreeze is rooted in the need for protecting potable water supplies. In such systems, there is a risk that the antifreeze or other contaminants could backflow into the drinking water supply, particularly under conditions that might lead to a loss of pressure, which can create a siphoning effect. RPZ devices provide a higher level of protection compared to other backflow prevention methods, such as double check valves or atmospheric vacuum breakers. They are specifically designed to handle situations where harmful substances might be introduced into the potable water system. The RPZ operates with two check valves and a pressure differential relief valve that maintains a constant pressure, ensuring that any backflow is contained and cannot contaminate the drinking water supply. In contrast, while double check valves are effective in many scenarios, they may not provide sufficient protection against backpressure conditions, which are critical in a closed-loop antifreeze system. Atmospheric vacuum breakers offer limited protection and are not appropriate for systems that can contain toxic or hazardous substances. As such, using an RPZ is the most effective method for safeguarding potable water in these situations.