

Gas Technician 2 (G2) License Practice Exam (Sample)

Study Guide



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SAMPLE

Questions

- 1. What diameter is specified for a Single Wall Vent Connector for a single appliance with an input of 1,000,000 BTUH and other defined factors?**
 - A. 10 Inches**
 - B. 12 Inches**
 - C. 14 Inches**
 - D. 16 Inches**
- 2. What type of venting is allowed for a gas appliance installed in conjunction with a chimney used by solid fuel?**
 - A. Same flue type venting**
 - B. Independent flue venting**
 - C. Common venting system**
 - D. Negative pressure venting**
- 3. What component prevents operation when the vent motor on a power vent water heater fails?**
 - A. Thermostat**
 - B. Pressure Switch**
 - C. Gas Valve**
 - D. Limit Switch**
- 4. What is the consequence of not purging every branch supply line before use?**
 - A. No consequences, as it is optional**
 - B. Increased risk of gas leaks**
 - C. Improved system efficiency**
 - D. Enhanced gas quality**
- 5. What is the normal fuse rating for a #14 AWG copper conductor?**
 - A. 20 Amps**
 - B. 10 Amps**
 - C. 15 Amps**
 - D. 25 Amps**

- 6. What role does a balancing valve play in a heating system?**
- A. It controls the temperature**
 - B. It adjusts the flow rate**
 - C. It prevents pressure buildup**
 - D. It enhances the fuel efficiency**
- 7. What is a common application for Propane Gas in residential settings?**
- A. Heating**
 - B. Air conditioning**
 - C. Electrical power generation**
 - D. Refrigeration**
- 8. What is the net result when two 10 microfarad capacitors are connected in series?**
- A. 10 mf**
 - B. 5 mf**
 - C. 15 mf**
 - D. 20 mf**
- 9. The external bypass valve is set by determining the:**
- A. Pressure Drop across the appliance**
 - B. Flow Rate of the system**
 - C. Temperature Rise across the appliance**
 - D. Efficiency Rating of the system**
- 10. Why is understanding flame speed important for gas technicians?**
- A. It helps in calculating pressure drops**
 - B. It determines fuel efficiency**
 - C. It affects combustion quality**
 - D. It measures gas purity**

Answers

SAMPLE

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

SAMPLE

Explanations

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1. What diameter is specified for a Single Wall Vent Connector for a single appliance with an input of 1,000,000 BTUH and other defined factors?

A. 10 Inches

B. 12 Inches

C. 14 Inches

D. 16 Inches

For a single appliance with an input of 1,000,000 BTUH, the standard practice is to refer to the manufacturer's specifications and relevant codes, which often dictate the size of the vent connector needed for proper performance and safety. In the case of this input level, the correct diameter for a single wall vent connector is indeed 12 inches. The size must be adequate to handle the flue gases produced by the appliance, ensuring that they can exit effectively while minimizing any risk of backdraft or inefficiency. The 12-inch diameter is a common requirement for appliances with high BTUH inputs because it balances the need for adequate airflow and reduces the risk of overheating or obstruction. The other dimensions listed, while they may be relevant for other appliances or configurations, do not meet the requirements set for a 1,000,000 BTUH input appliance according to standard industry practices and codes. Therefore, selecting 12 inches is essential for ensuring safety and efficiency in the venting process.

2. What type of venting is allowed for a gas appliance installed in conjunction with a chimney used by solid fuel?

A. Same flue type venting

B. Independent flue venting

C. Common venting system

D. Negative pressure venting

The scenario describes a gas appliance that is installed alongside a chimney used for solid fuel, which brings specific requirements for venting. Independent flue venting is the selected answer because it allows for the safe and effective discharge of exhaust gases from the gas appliance without interfering with or being affected by the combustion products from the solid fuel appliance. Using independent flue venting ensures that the different fuel types have separate pathways for venting, thus minimizing the risk of backdraft or interference that can occur when gases from solid fuels join those from gas appliances. This separation is critical for safety, as it prevents harmful gases from entering the living space and ensures proper functioning of each appliance. In contrast, other types of venting may not provide the necessary segregation of exhaust. For instance, same flue type venting or common venting systems could lead to dangerous situations where combustion products from one appliance disrupt or contaminate the venting of the other. Negative pressure venting is typically used to describe scenarios where the pressure in the venting system is lower than that of the surrounding environment, which may not be suitable in a shared chimney context due to safety concerns.

3. What component prevents operation when the vent motor on a power vent water heater fails?

- A. Thermostat
- B. Pressure Switch**
- C. Gas Valve
- D. Limit Switch

The pressure switch plays a critical role in ensuring the safe operation of a power vent water heater. When the vent motor fails, the pressure switch detects this malfunction and prevents further operation of the appliance. This is an essential safety feature designed to avoid dangerous situations that might arise from inadequate venting, which could lead to the accumulation of harmful combustion gases inside the home. The pressure switch functions by monitoring the airflow generated by the vent motor. If the motor ceases to operate, airflow is disrupted, triggering the pressure switch. This switch then signals the gas valve to shut off, ensuring that combustion does not occur without proper venting, thus protecting both the appliance and the occupants of the home from potential hazards. In this context, the other components listed do not have the same primary safety function linked specifically to the failure of the vent motor. For example, while the thermostat controls the temperature of the water, it does not directly respond to the status of the vent motor. Similarly, the gas valve and limit switch have different operational controls in the system, focusing on gas supply management and temperature regulation, respectively. Thus, the pressure switch is uniquely responsible for safety during a vent motor failure.

4. What is the consequence of not purging every branch supply line before use?

- A. No consequences, as it is optional
- B. Increased risk of gas leaks**
- C. Improved system efficiency
- D. Enhanced gas quality

Purging every branch supply line before use is a critical safety procedure, primarily to mitigate the increased risk of gas leaks. When branch supply lines are not purged, they may contain air or moisture that can lead to improper combustion or potentially make the system unsafe. The presence of these substances can create a mixture that is prone to leaks, which poses a significant hazard not only to property but also to personal safety. Ensuring that each branch line is purged helps remove any contaminants and reduces the likelihood of gas leakage as it prepares the lines for safe operation. This practice is essential for maintaining the integrity of the gas system and ensuring that it operates safely and efficiently. Proper purging facilitates a clean flow of gas, promoting optimal combustion and system performance, while also significantly reducing the chances of dangerous leaks occurring.

5. What is the normal fuse rating for a #14 AWG copper conductor?

- A. 20 Amps**
- B. 10 Amps**
- C. 15 Amps**
- D. 25 Amps**

The normal fuse rating for a #14 AWG copper conductor is generally considered to be 15 Amps. This rating is based on the National Electrical Code (NEC) guidelines, which specify that #14 gauge wire is suitable for a maximum of 15 Amps of continuous current. Using a proper fuse rating ensures that the circuit is adequately protected from overheating and potential fire hazards. When the current flowing through the conductor exceeds its rating, the fuse operates to disconnect the power, thus safeguarding the wiring and connected devices from damage. In practical applications, understanding the appropriate fuse rating helps maintain safety and efficiency within electrical systems.

6. What role does a balancing valve play in a heating system?

- A. It controls the temperature**
- B. It adjusts the flow rate**
- C. It prevents pressure buildup**
- D. It enhances the fuel efficiency**

A balancing valve plays a crucial role in managing the flow of water in a heating system, which is essential for maintaining efficient and effective operation of the system. By adjusting the flow rate, the balancing valve ensures that there is an even distribution of heating fluid throughout the system, allowing for consistent temperatures in all areas served by the heating system. This flow adjustment is vital to prevent certain areas from receiving too much or too little heat, improving overall comfort and efficiency. When the flow rate is properly balanced, the heating system can operate more efficiently, leading to improved energy usage and potentially lower operating costs. This is important for both residential and commercial heating applications, where maintaining an optimal flow rate can enhance comfort levels and system performance. Balancing valves are typically installed in hydronic heating systems to achieve this purpose effectively.

7. What is a common application for Propane Gas in residential settings?

A. Heating

B. Air conditioning

C. Electrical power generation

D. Refrigeration

In residential settings, a common application for propane gas is heating. Propane is often used in furnaces, boilers, and space heaters to provide warmth during colder months. Its high energy content and efficiency make it an excellent choice for heating homes, particularly in areas where natural gas is not available. Propane heating systems are also popular because they can be easily installed in various configurations, including direct vent systems, which improve safety and efficiency. Additionally, propane heating works well in combination with other energy sources, allowing flexibility in energy use. While other applications such as air conditioning, electrical power generation, and refrigeration exist, they are not as typical for propane in residential settings compared to heating. Air conditioning primarily relies on electricity, electrical power generation entails larger systems often using other fuels, and refrigeration (especially for conventional home refrigerators) usually does not depend on propane as a primary fuel source. Therefore, heating stands out as the most common and appropriate application for propane gas in residences.

8. What is the net result when two 10 microfarad capacitors are connected in series?

A. 10 mf

B. 5 mf

C. 15 mf

D. 20 mf

When capacitors are connected in series, the total capacitance can be calculated using the reciprocal formula. Specifically, for two capacitors in series, the formula is: $1/C_{\text{total}} = 1/C_1 + 1/C_2$. In this case, both capacitors have a capacitance of 10 microfarads (μF). Plugging the values into the formula, we have: $1/C_{\text{total}} = 1/10 + 1/10$. This simplifies to: $1/C_{\text{total}} = 2/10$. Rearranging this gives: $C_{\text{total}} = 10/2 = 5$ microfarads (μF). Thus, when two 10 microfarad capacitors are connected in series, their combined capacitance results in 5 microfarads.

9. The external bypass valve is set by determining the:

- A. Pressure Drop across the appliance**
- B. Flow Rate of the system**
- C. Temperature Rise across the appliance**
- D. Efficiency Rating of the system**

The external bypass valve is crucial for maintaining appropriate conditions in a gas system. When setting this valve, you need to determine the temperature rise across the appliance. This is essential because the temperature rise indicates how effectively the appliance is operating and whether it is achieving the desired heating effect. By measuring the temperature before and after the appliance, you can ascertain if the bypass valve is set correctly to allow the right amount of flow, ensuring optimal operation and efficiency. In contrast, while factors such as pressure drop and flow rate provide valuable information about the performance and capacity of the system, they do not directly relate to the temperature performance of the appliance in terms of service delivery. Efficiency rating contributes to understanding overall performance but is more a characteristic of the appliance's design and construction rather than a setting for the external bypass valve. Focused on temperature rise reflects the direct impact of the bypass valve's setting on appliance efficiency and operational capabilities.

10. Why is understanding flame speed important for gas technicians?

- A. It helps in calculating pressure drops**
- B. It determines fuel efficiency**
- C. It affects combustion quality**
- D. It measures gas purity**

Understanding flame speed is crucial for gas technicians because it directly impacts combustion quality. Flame speed refers to the rate at which a flame propagates through a combustible gas-air mixture. When flame speed is optimal, it ensures complete combustion, which is essential for maximizing energy output and minimizing harmful emissions. Inadequate knowledge of flame speed can lead to inefficient combustion, creating a risk of incomplete burning of gas, which can result in the release of carbon monoxide and other hazardous by-products. Furthermore, it can cause unstable flame characteristics, potentially leading to operational issues, decreased appliance performance, and safety hazards. Thus, mastering flame speed allows gas technicians to adjust burner settings, enhance the design of systems, and ensure safe and efficient operation of gas-fired appliances, making it a foundational aspect of their role.