

SAIT 1st Year Plumbing Practice Exam (Sample)

Study Guide



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Questions

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- 1. Which of the following is NOT a method for identifying metal?**
 - A. Visual appearance and color**
 - B. Fractured surface**
 - C. Relative weight**
 - D. Magnetic resonance**
- 2. What function does a trap serve in plumbing?**
 - A. It filters solids from liquid waste**
 - B. It prevents sewer gases from entering buildings**
 - C. It connects multiple drainage lines**
 - D. It regulates water pressure in the system**
- 3. What is NOT one of the four main categories of workplace hazards?**
 - A. Biological**
 - B. Chemical**
 - C. Ergonomic**
 - D. Electrical**
- 4. What are the three elements of fire?**
 - A. Fuel, Heat, Chemical Reaction**
 - B. Air, Ignition, Fuel**
 - C. Air, Fuel, Heat**
 - D. Oxygen, Gas, Heat**
- 5. What are the correct densities of water?**
 - A. 1000 kg/m³ or 62.4 lb/ft³**
 - B. 500 kg/m³ or 31.2 lb/ft³**
 - C. 2000 kg/m³ or 124.8 lb/ft³**
 - D. 750 kg/m³ or 46.8 lb/ft³**

- 6. Which of the following methods is typically used for joining plastic pipes?**
- A. Soldering**
 - B. Brazing**
 - C. Solvent welding**
 - D. Welding**
- 7. What is the purpose of a ground fault circuit interrupter (GFCI)?**
- A. To enhance electrical flow**
 - B. To break current flow and protect from electrical shock**
 - C. To regulate voltage**
 - D. To increase current flow**
- 8. What color signifies Class B wiring?**
- A. Red**
 - B. Blue**
 - C. Green**
 - D. Black**
- 9. What is the primary function of infrared radiant energy?**
- A. It is visible**
 - B. It can cause burns**
 - C. It penetrates deeply and causes retinal damage**
 - D. It is harmless**
- 10. What condition may occur due to a cross-connection?**
- A. Increased water pressure**
 - B. Water contamination**
 - C. Pipe damage**
 - D. Drain clogs**

Answers

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

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Explanations

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1. Which of the following is NOT a method for identifying metal?

- A. Visual appearance and color**
- B. Fractured surface**
- C. Relative weight**
- D. Magnetic resonance**

Magnetic resonance is not a conventional method for identifying metals in practical plumbing applications. Instead, it is a technique more commonly associated with medical imaging (like MRI) or scientific research rather than a straightforward assessment of materials in a field setting. In contrast, visual appearance and color can provide initial clues about a metal's type; for instance, copper is reddish, while aluminum is typically silver. Examining a fractured surface can reveal characteristics indicative of specific metals, such as grain structure or brittleness. Relative weight is also useful since different metals have distinct densities, allowing for identification based on how heavy or light a material feels compared to others. Therefore, the most appropriate methods for identifying metals in practical scenarios would not include magnetic resonance, which is why that choice is correct.

2. What function does a trap serve in plumbing?

- A. It filters solids from liquid waste**
- B. It prevents sewer gases from entering buildings**
- C. It connects multiple drainage lines**
- D. It regulates water pressure in the system**

A trap in plumbing primarily serves the critical function of preventing sewer gases from entering buildings. It achieves this by creating a water seal that acts as a barrier between the plumbing system and the atmosphere. When wastewater flows through the trap, it fills a portion of the trap with water. This water seal is vital because it blocks harmful gases, such as methane and hydrogen sulfide, that are found in the sewer system. By maintaining this seal, traps help to ensure a safe and healthy indoor environment. The other functions related to plumbing systems, such as filtering solids, connecting drainage lines, or regulating water pressure, are not primary roles of a trap. Filtering solids is typically handled by other mechanisms, such as strainers or filters. Connections between drainage lines are made using fittings and connectors, while water pressure regulation is managed by specific devices designed for that purpose, like pressure regulators or valves. Understanding the specific role of a trap emphasizes its importance in maintaining both the safety and functionality of plumbing systems.

3. What is NOT one of the four main categories of workplace hazards?

- A. Biological**
- B. Chemical**
- C. Ergonomic**
- D. Electrical**

In the context of workplace hazards, the four main categories typically include biological, chemical, physical, and ergonomic hazards. Biological hazards involve exposure to living organisms that can cause health issues, such as bacteria and viruses. Chemical hazards relate to substances that can cause harm through various means, such as toxicity or flammability. Ergonomic hazards stem from poorly designed workspaces or repetitive tasks that can lead to musculoskeletal injuries. While electrical hazards are significant and must be addressed in workplace safety, they fall under the broader category of physical hazards. Therefore, electrical hazards are not typically considered one of the four main categories of workplace hazards, which is why identifying them as separate is accurate in this instance.

4. What are the three elements of fire?

- A. Fuel, Heat, Chemical Reaction**
- B. Air, Ignition, Fuel**
- C. Air, Fuel, Heat**
- D. Oxygen, Gas, Heat**

The three elements of fire are fuel, heat, and oxygen, which are commonly referred to as the "fire triangle." Fuel provides the combustible material, heat initiates and sustains the combustion process, and oxygen facilitates the chemical reaction that occurs during combustion. In the context of the correct answer, the combination of air and fuel (which contains the necessary organic materials) and heat creates an environment where fire can ignite and continue burning. This understanding is critical for effective fire prevention and safety measures in plumbing and other fields, as eliminating any one of these elements can extinguish a fire. The relevance of this understanding extends beyond just identifying the fire triangle. It is also pivotal in scenarios such as assessing fire hazards in a plumbing environment, where combustibles may be present, and proper ventilation and elimination of ignition sources are essential for safety. The other options mention combinations of elements, but they do not accurately represent the fundamental components necessary for fire as established in fire science. For example, while "air" can be thought of as containing oxygen, it is essential to specify oxygen as the crucial reactive gas, distinguishing it from other elements of the atmosphere.

5. What are the correct densities of water?

- A. 1000 kg/m³ or 62.4 lb/ft³**
- B. 500 kg/m³ or 31.2 lb/ft³**
- C. 2000 kg/m³ or 124.8 lb/ft³**
- D. 750 kg/m³ or 46.8 lb/ft³**

The correct densities of water are indeed 1000 kg/m³ and 62.4 lb/ft³. This value represents the mass of water per unit volume, which is a standard measurement used in various fields including plumbing, engineering, and environmental science. At a temperature of 4°C, water reaches its maximum density, making these values essential for calculations related to buoyancy, fluid dynamics, and hydraulic systems. Understanding the density of water is crucial for plumbers, as it affects how water behaves in pipes and fixtures, influences the sizing of piping systems, and is vital for calculating the required water pressure for efficient plumbing systems. The other options provided represent densities that do not apply to water at standard conditions, as they are either too low or too high compared to the recognized standard density of pure water. Thus, option A stands out as the accurate representation of water's density under normal conditions.

6. Which of the following methods is typically used for joining plastic pipes?

- A. Soldering**
- B. Brazing**
- C. Solvent welding**
- D. Welding**

Solvent welding is the correct method for joining plastic pipes. This process involves applying a solvent adhesive to the surfaces of the pipes being joined, which softens the plastic, allowing the pipes to fuse together as the solvent evaporates. This creates a strong, permanent bond that is essential for a leak-proof connection in plumbing systems. In practice, solvent welding is commonly used with PVC, CPVC, and ABS pipes, making it a preferred method due to its effectiveness in forming seamless joints without the need for additional hardware or mechanisms. The technique is generally straightforward and requires minimal tools, which further enhances its appeal in plumbing applications. Understanding this method is crucial for students in plumbing, as it helps ensure proper assembly techniques are employed for reliable plumbing installations.

7. What is the purpose of a ground fault circuit interrupter (GFCI)?

- A. To enhance electrical flow**
- B. To break current flow and protect from electrical shock**
- C. To regulate voltage**
- D. To increase current flow**

The purpose of a ground fault circuit interrupter (GFCI) is to break current flow and provide protection from electrical shock. A GFCI detects imbalances in the electrical current between the incoming and outgoing wires. If it senses any leakage of current, which could indicate that electricity is flowing through an unintended path (such as through a person), it will quickly interrupt the circuit. This rapid response can prevent serious injury or death due to electric shock, particularly in wet areas like bathrooms and kitchens where the risk of electrical hazards is higher. In contrast, enhancing electrical flow or increasing current flow are not functions of a GFCI; in fact, a GFCI stops current flow under unsafe conditions. Regulating voltage is also not related to the primary function of a GFCI, as its main functionality focuses on detecting current leakage and ensuring safety rather than managing voltage levels within electrical systems.

8. What color signifies Class B wiring?

- A. Red**
- B. Blue**
- C. Green**
- D. Black**

Class B wiring is indicated by the color red. This color coding is part of a standardized system used to easily differentiate between various types of wiring, as each classification serves a different function in electrical systems. Class B typically refers to wiring that carries lower voltage and is often used for control circuits. The red color is a clear signal to electricians and technicians about the specific wiring type, helping to maintain safety and organization during installation and maintenance. This standardized color coding plays a critical role in ensuring that wiring is handled correctly according to electrical codes and safety regulations.

9. What is the primary function of infrared radiant energy?

- A. It is visible
- B. It can cause burns
- C. It penetrates deeply and causes retinal damage**
- D. It is harmless

The primary function of infrared radiant energy relates to how it interacts with matter, particularly in the context of heat transfer. Infrared radiation is a form of electromagnetic radiation that is primarily associated with the thermal emission from objects. When discussing its effects, it is essential to note that infrared energy can penetrate the skin and other materials to a certain extent, leading to thermal effects within tissues. The indication that infrared can cause retinal damage is tied to the fact that prolonged exposure to intense infrared radiation can result in harmful thermal effects on the eye's retina. While infrared radiation is not visible to the human eye, it can still produce significant thermal effects, which is why safety measures are necessary when working with high-intensity infrared sources. This understanding highlights that while infrared radiation is often considered less harmful than other forms of radiation, it indeed possesses the capacity to cause biological damage under certain conditions. Proper awareness and safety practices are crucial to mitigate these risks while recognizing the role of infrared energy in various applications, including heating, medical therapies, and industrial processes.

10. What condition may occur due to a cross-connection?

- A. Increased water pressure
- B. Water contamination**
- C. Pipe damage
- D. Drain clogs

A cross-connection occurs when a potable (drinking) water supply is linked with a non-potable source, which creates the risk of contamination due to backflow. This situation may arise in various scenarios, such as when a hose is submerged in a contaminated source like a cleaning solution or irrigation ditch. If pressure changes occur in the water supply system, it can draw contaminated water back into the clean water supply, leading to serious health risks for consumers. Contaminated water can introduce harmful bacteria, chemicals, or other pollutants into the potable water system, which can then be consumed unknowingly by individuals using the water. This highlights the importance of proper plumbing practices, including the use of backflow prevention devices, to safeguard public health and maintain the integrity of the water supply. In cases of increased water pressure, pipe damage, or drain clogs, those may occur within a plumbing system due to separate issues such as blockages or wear and tear, but they do not necessarily relate to the specific health risks posed by a cross-connection. Therefore, water contamination is uniquely associated with cross-connections and underscores the critical need for preventative measures in plumbing systems.