

Oil Heat System Technician



1. Dry air required to burn one lb of carbon completely may be
 - ☒ (A) 11.5 lb
 - ☐ (B) 2.67 lb
 - ☐ (C) 16 lb
 - ☐ (D) none of these
2. What must be protected from physical damage according to fuel-oil piping and storage regulations?
 - ☐ (A) Only oil burners
 - ☐ (B) Only fuel-oil storage tanks
 - ☐ (C) Only appliances connected to the piping
 - ☒ (D) All fuel-oil piping, equipment and appliances
3. If a heating system equipped with a reverse acting aquastat is experiencing frequent boiler shut-offs, what troubleshooting step should be taken?
 - ☒ (A) Check the temperature settings of the aquastat.
 - ☐ (B) Evaluate the oxygen levels in the combustion chamber.
 - ☐ (C) Test the circulator for proper operation.
 - ☐ (D) Inspect the oil lines for leaks.
4. Describe the significance of fill caps in the water tank filling process.
 - ☐ (A) Fill caps are used to measure the water level in the tanks.
 - ☐ (B) Fill caps are primarily for maintenance access.
 - ☒ (C) Fill caps allow for the introduction of water into the tanks.
 - ☐ (D) Fill caps prevent water from escaping the tanks.
5. What is one of the three tests that must be conducted before operating a fuel burning and storage installation?
 - ☐ (A) Temperature of the storage tanks.
 - ☒ (B) Tightness of liquid fuel piping.
 - ☐ (C) Efficiency of combustion.
 - ☐ (D) Air supply levels.

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6. If an oil burner is producing a blue flame instead of the desired orange flame with red tips, what troubleshooting step should be taken first?
- ☒ (A) Check the air-to-fuel ratio for proper combustion. ☐ (B) Inspect the fuel tank for leaks.
- ☐ (C) Replace the oil pump immediately. ☐ (D) Increase the fuel flow to the burner.
7. What should you check in the combustion chamber before pushing the reset button on an oil burner?
- ☒ (A) Check for excess oil ☐ (B) Verify the fuel supply
- ☐ (C) Inspect the electrical connections ☐ (D) Ensure the burner is clean
8. Describe how the high static pressure of a flame retention burner contributes to heating efficiency.
- ☐ (A) The high static pressure reduces the amount of fuel needed for combustion. ☐ (B) The high static pressure makes the burner easier to install.
- ☒ (C) The high static pressure allows for better heat exchange in boilers and furnaces, improving overall efficiency. ☐ (D) The high static pressure increases the noise level of the burner.
9. What component is adjusted to change the air ratio in an adjustable head burner?
- ☐ (A) The fuel pump ☐ (B) The ignition transformer
- ☐ (C) The oil burner nozzle ☒ (D) The position of the drawer assembly in the air tube
10. If a fuel unit is not preventing dirt and sludge from clogging the pump and nozzle, what potential issues could arise in the oil heating system?
- ☒ (A) Frequent burner shutdowns and potential damage to the system. ☐ (B) Improved combustion and lower emissions.
- ☐ (C) Increased efficiency and reduced fuel consumption. ☐ (D) Enhanced safety measures and reduced risk of fire.

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11. Explain why swing joints are necessary in the installation of oil burners, particularly in relation to pitch.
- ☐ (A) They prevent leaks by sealing connections
 - ☐ (B) They enhance the aesthetic appearance of the installation
 - ☒ (C) They accommodate changes in alignment due to thermal expansion
 - ☐ (D) They are used to connect electrical components
12. Skimming on a steam boiler is done to ____.
- ☐ (A) Remove sludge in the mud drum
 - ☐ (B) Remove oils or suspended solids in the bottom of the boiler
 - ☒ (C) Remove oils or suspended solids on the water surface
 - ☐ (D) All correct responses
13. Do heavier hydrocarbons tend to produce more or less carbon dioxide upon combustion compared to lighter hydrocarbons? Why?
- ☐ (A) Heavier hydrocarbons produce the same amount carbon dioxide as lighter hydrocarbons because complete combustion always results in the same two compounds, CO₂ and H₂O.
 - ☐ (B) Heavier hydrocarbons produce less carbon dioxide because by percentage there is less carbon in their molecular structure.
 - ☒ (C) Heavier hydrocarbons produce more carbon dioxide because they have a greater proportion of carbon in their molecular structure.
 - ☐ (D) Heavier hydrocarbons produce less carbon dioxide because they tend to produce both carbon monoxide and carbon trioxide in addition to carbon dioxide when they combust.
14. Explain why heating oil needs to be converted into a gas (vapor) before it can burn. What is the significance of this process in oil heating systems?
- ☐ (A) It enhances the oil's viscosity
 - ☐ (B) It increases the oil's density for better storage
 - ☒ (C) It allows for more efficient combustion and energy release
 - ☐ (D) It prevents the oil from freezing

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15. Explain why the temperature at which 10% of a fuel oil is distilled should be within an acceptable range of the initial boiling point (IBP).
- (A) To maintain the efficiency of the combustion process. (B) To ensure the fuel oil has a consistent quality.
- (C) To ensure proper handling and storage of the fuel oil. (D) To prevent the fuel oil from evaporating too quickly.
16. If a technician observes that the stack temperature of an oil burner is higher than the recommended range, what adjustment should they consider making regarding excess air levels?
- (A) Increase the excess air to ensure complete combustion and further raise stack temperature. (B) Maintain the current excess air levels as they are optimal for performance.
- (C) Adjust the fuel nozzle size to compensate for excess air levels. (D) Decrease the excess air to improve combustion efficiency and lower stack temperature.
17. Describe the significance of the High Limit cut out in the context of oil burner safety controls.
- (A) The High Limit cut out regulates fuel flow to the burner. (B) The High Limit cut out measures the efficiency of the burner.
- (C) The High Limit cut out is used for routine maintenance checks. (D) The High Limit cut out is crucial for preventing overheating and ensuring safe operation of the burner.
18. If an oil burner technician notices that the CO₂ percentage reading is consistently above the desired level, what action should they take regarding the over-fire draft setting, and why?
- (A) Maintain the current over-fire draft setting as it is within acceptable limits. (B) Decrease the over-fire draft to -0.01 'wc' to reduce CO₂ emissions.
- (C) Adjust the over-fire draft to -0.01 to -0.02 'wc' to optimize combustion efficiency. (D) Increase the over-fire draft to -0.03 'wc' to improve combustion.
19. Which of the following systems is designed so all of the circulating water passes through each component in the system?
- (A) Two-pipe hydronic system (B) Reverse return hydronic system
- (C) Series loop hydronic system (D) One-pipe hydronic system

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20. Explain the role of the Canadian General Standards Board (CGSB) in relation to fuel oil and kerosene standards in Canada.
- ☐ (A) To provide safety training for oil burner technicians
 - ☒ (B) To establish minimum quality standards for fuel oils and kerosene
 - ☐ (C) To regulate the pricing of fuel oils
 - ☐ (D) To oversee the installation of fuel oil systems
21. Explain the significance of degree days in relation to heating systems.
- ☐ (A) They are used to calculate fuel consumption for air conditioning.
 - ☐ (B) They represent the total energy output of a heating system.
 - ☐ (C) They measure the efficiency of cooling systems.
 - ☒ (D) They indicate the amount of heating required based on temperature variations.
22. What is a key advantage of using a flame retention burner in heating systems?
- ☐ (A) It reduces the need for regular maintenance
 - ☐ (B) It increases the size of the combustion chamber
 - ☐ (C) It allows for the use of lower quality fuel
 - ☒ (D) The high static pressure enables boilers and furnaces with tighter more efficient heat exchanger passages
23. Gravity-feed oil tanks should be installed to;
- ☐ (A) Pitch away from the ½" tapping on the bottom of the tank
 - ☒ (B) To be as close to the ground as possible
 - ☐ (C) Pitch toward the ½" tapping on the bottom of the tank
 - ☐ (D) Be perfectly level
24. What are the two methods used to adjust oil flow in a rotary burner?
- ☐ (A) Pressure gauge and flow meter
 - ☐ (B) Manual valve and automatic regulator
 - ☐ (C) Temperature control and pressure relief
 - ☒ (D) Constant level and metering valve
25. What are the three main functions of the oil burner nozzle in a high-pressure burner?
- ☐ (A) Filters impurities, regulates temperature, controls pressure
 - ☒ (B) Atomizes the oil, provides a pattern of oil spray, delivers a fixed amount of oil
 - ☐ (C) Maintains fuel temperature, adjusts air intake, monitors pressure
 - ☐ (D) Increases combustion speed, reduces emissions, enhances safety