1. What are the three types of fuels? Solid, gas, and liquid.

2. What is combustion? The union of oxygen with a substance and light and heat produced.

3. Will liquid fuels burn? No, they must be changed to a gas or vapor and mixed with air.

4. What is atomization? Spraying

5. What type of atomization is found in standard residential oil burners? High pressure atomization.

6. What is the pressure of the oil pump in a standard residential oil burner? 690KPa or 100psi.

7. How is the spark provided for ignition in an oil burner? High voltage arc across electrodes.

8. What is the typical operating voltage of the ignition transformer in an oil burner? 10,000V

9. How high above the floor must a conductor be before it will not require mechanical protection? 1.5m

10. Why is a disconnect switch typically placed at the furnace unit? Maintenance.

11. Where is an emergency switch typically installed? Stairway to basement.

12. What type of switch is used for the emergency switch on an oil burner? Toggle (light switch)

13. What type of cover plate is required for an emergency switch? Red Emergency

14. What voltage is typically used for the control wiring in an oil burner? 24V
15. What are the three main controls on an oil burner? Thermostat, primary and limit.

16. What are the two functions of the limit control on a hot air furnace? Cycle fan and high-limit.

17. What function of a hot air furnace is stopped by the high limit control? Burner only.

18. What is the purpose of limit control on a hot air furnace? Keep the fan from circulating cold air.

19. How is the fan controlled in the summer to circulate air? Manual switch.

20. What temperature is the high-limit control set at in a hot air furnace? 93°C

21. What is the purpose of the primary control in a furnace system? Prevent operation of the oil burner when conditions exist that make such operation unsafe or hazardous.

22. What are the two types of primary controls? Thermal and visual.

23. Which ignition system is energized for a predetermined time period? Interrupted ignition and Intermittent ignition.

24. Which ignition system is energized all the time the burner is operating? Intermittent ignition.

25. Which component in a furnace system will prove the presence of flame? Primary control.

26. What are the two methods for detecting a flame? Thermal and visual.

27. How are the “hot/cold” contacts reset in a thermal primary control? Pull all the way out and slowly release.
28. How long will the burner operate in a furnace system controlled by a stack switch if no ignition is detected? 90 sec

29. Why should a primary control not be reset several times without correcting the problem? Pumping in oil all the time without ignition.

30. What is a cadmium sulfide cell? Light sensitive cell that changes resistance with amount of light. (more light less resistance)

31. How is a cad cell accessed for cleaning or inspection? Unplug from receptacle.

32. What is the result of a cad cell sensing light before a burner starts? It will not start.

33. Which component in a hydronic heating system is the equivalent of a high limit control in a hot air system? High-limit aquastat.

34. Which component in a hydronic heating system is the equivalent of fan blower in a hot air system? Circulator

35. What is a direct acting aquastat? What is a reverse-acting aquastat? Make on a drop in temperature and open on a rise. Make on a rise and open on a drop.

36. Which aquastat provides more accurate control? Immersion type.

37. What is low-limit protection for a circulator? Combination control.

38. What is high-limit protection for a hot water system? Combination control


40. What is the main disadvantage of a combination control? When one part fails, the control must be replaced.
41. What is done with the thermostat terminals on a primary control when the thermostat is connected through a combination control? Jumper out.

42. What are the typical settings for an oil fired water heater? 490-600

43. What is the purpose of the magnesium anode in a water heater? Reduce corrosion.

44. What is the purpose of a dip tube? Take the cold water to the bottom of the tank.

45. What is the purpose of a delayed-oil valve? Cleaner start-up. Allow pressure to build in the pump, combustion air build up, and chimney draft before ignition.

46. How are the two units in a combination wood/oil furnace operated without both coming on at the same time? Interlocking relay.

47. What is the advantage of an add-on wood/oil unit compared to a single unit? Typically less.

48. How is the burning rate of solid fuel controlled? Damper door.

49. Where must the 120/24 V transformer be connected in the wood add-on unit for an oil furnace? Why? After the high-limit control so the damper door closes if the plenum gets too hot.

50. What is a two-stage thermostat and how does it work? Allows one unit to operate as long as the temperature doesn’t drop more than two degrees, then other one will operate.

51. Is it possible to control a combination wood/oil furnace by two separate thermostats? Yes

52. What is an interlocking relay used for? Keep one unit off when the other one is operating.

53. Other than wood/oil, what other combination is used for furnaces? Wood/electric
54. What does the room thermostat control in a zoned hydronic system? Zone valve.

55. In an-oil fired zoned hydronic system, what two components control the circulator? Zone valve end switch and thermostat.

56. How is the burner controlled in a zoned hydronic system? Limit control

57. At what point in the operating cycle of a zone valve does the end switch operate? Completely open.

58. What is the most important factor in troubleshooting an oil furnace? Have a system.

59. What are the three types of complaints for a malfunctioning oil furnace? No go-no heat, too much or too little heat, and defective operation.

60. Which complaints are electricians qualified to address? No go-no heat.

61. What is the first check for a “no go” furnace if the overcurrent device is intact? Emergency switch.

62. What is the next check after the emergency switch is eliminated? Thermostat

63. If a furnace runs when the terminals “TT” are shorted but stops when they are open, what is the next check? Thermostat or wires.

64. How will an oil burner operate if the cad cell is faulty or dirty? Runs for a few seconds then shuts off.