

HVAC BASIC QUIZ

1. You have a single phase compressor that will not start. You OHM the compressor and read resistance between run and start, but infinity from common to run and common to start. The compressor is:
 - a. Not pumping
 - b. Grounded
 - c. Open on internal overload
 - d. Three phase

2. You have a three phase compressor that will not start. There is proper voltage at the compressor terminals. What can you do to try to get the compressor to start?
 - a. Install larger run capacitor
 - b. Reverse two power leads
 - c. Install a hard start kit
 - d. Remove freon
 - e. Any of the above

3. You have a compressor run capacitor with a resistor across the two terminals. It bleeds voltage:
 - a. To protect the Service Tech
 - b. To discharge the capacitor
 - c. To help the capacitor to last longer
 - d. For off cycle crankcase heat

4. You have a single phase compressor that draws high amperage and cuts out on internal overload when starting. The most probably cause would be:
 - a. Bad contractor
 - b. Open windings
 - c. Dirty condensing coil
 - d. Defective start relay

5. The OHM reading across a single phase compressor terminals are:
A to B = 2 OHMS A to C = 7 OHMS B to C = 5 OHMS
 - a. A is run, B is common, C is start
 - b. B is run, A is common, C is start
 - c. C is run, A is common, B is start
 - d. A is run, C is common, B is start

6. In a split system heat pump, where would you find the accumulator?
 - a. In the indoor unit
 - b. Between the compressor and the 4-way valve
 - c. In the suction line outside the unit
 - d. Between the indoor and the outdoor units
 - e. In the liquid line leaving the condenser

7. Which describes the purpose of an accumulator:
 - a. Store excess refrigerant
 - b. Acts as a muffler, to make compressor more quiet
 - c. Protect compressor from liquid refrigerant
 - d. Keep oil from leaving the condensing unit

8. You are working on an air to air split system heat pump. In the cooling mode, the compressor runs but the outdoor fan motor does not. Further checks reveal there is nothing wrong with the fan motor or capacitor. Which of the following is the most likely cause of the problem?
 - a. A faulty heat relay
 - b. A faulty contractor
 - c. A faulty defrost control
 - d. A faulty reversing valve

9. An expansion valve heat pump system operates normally in the heating cycle but pumps itself down in the cooling cycle. Which of the following explanations is possible?
 - a. The indoor check valve is stuck open
 - b. The indoor check valve is stuck closed
 - c. The power head (thermal element) on the outdoor expansion valve is faulty
 - d. The power head (thermal element) on the indoor expansion valve is faulty

10. In an operating air conditioning system, the normal flow of refrigerant leaving the metering device would next enter:
 - a. The evaporator coil
 - b. The condensing coil
 - c. The expansion valve
 - d. The compressor
 - e. The liquid service valve

11. In a heat pump operating in the heating mode, if the indoor fan failed to operate while the thermostat was calling for heat, what would happen?
 - a. The outdoor coil would ice up
 - b. The indoor coil would ice up
 - c. The low pressure switch would open
 - d. The high pressure switch would open

12. In the heat pump defrost cycle, the following components operate as indicated:
 - a. Outdoor fan - off; Reversing Valve - heating position; Indoor Fan - on
 - b. Outdoor fan - off; Reversing Valve - cooling position; Indoor Fan - off
 - c. Outdoor fan - off; Reversing Valve - cooling position; Indoor Fan - on; Auxiliary Heat - on
 - d. Outdoor fan - on; Reversing Valve - cooling position; Indoor Fan - on; Auxiliary Heat - on

13. The cooling anticipator is:
 - a. In series with the thermostat contacts
 - b. In parallel with the compressor relay coil
 - c. In parallel with thermostat contacts
 - d. In series with the transformer secondary

14. The heating anticipator is:
 - a. In series with the thermostat contacts
 - b. In parallel with the gas valve coil
 - c. In parallel with the thermostat contacts
 - d. In series with the transformer secondary

15. The heat anticipator is adjusted and set according to:
 - a. Current (amps) through 24v secondary
 - b. Current (amps) through thermostat
 - c. V.A. rating of gas valve
 - d. V.A. rating of transformer secondary

16. Superheat can be adjusted by adding and removing refrigerant, either on a fixed expansion device or TXV system.
 - a. True
 - b. False

17. Which of the below best describes how to measure Super Heat?
- The temperature difference across a gas fired heat exchanger (temperature rise)
 - Liquid pressure converted to temperature subtracted from actual temperature of liquid line
 - The temperature rise across a condenser coil
 - Suction pressure converted to temperature subtracted from the actual suction line tempera-
18. What is the best procedure for measuring the oil pressure on a 7 1/2 Ton Copelametic compressor?
- Pump outlet pressure added to crankcase pressure
 - Pump inlet pressure added to head pressure
 - Check with Copelametic oil pressure gauge
 - Pump outlet pressure minus crankcase pressure
 - If oil level is 3/4 up site glass, pressure is O.K.
19. What is the normal operating oil pressure of the above compressor?
- 35 - 45 PSIG
 - 50 - 75 PSIG
 - 50 - 100 PSIG
 - 5 - 25 PSIG
20. A compound gauge reads:
- High pressure only
 - Vacuum only
 - Both pressure and vacuum
 - Pressure in a hot water boiler system
21. You have a low pressure refrigeration control with a cut-in pressure and a differential pressure setting. Cut in is set at 34 PSIG. You want it to cut out at 22 PSIG. The differential should be set at:
- 56 PSIG
 - 12 PSIG
 - 6 PSIG
 - 24 PSIG

22. On a refrigeration system the capillary tube is wrapped around the suction line to:
- Increase refrigerant flow
 - Increase latent heat
 - Increase capacity
 - Increase sub-cooling
 - All of the above
23. Which describes how a potential start relay should be wired?
- #1 to start capacitor, #2 to run winding, #6 to common winding
 - #1 to run winding, #5 to common winding, #2 to start capacitor
 - #2 to start capacitor, #4 to start winding, #5 to common winding
 - #1 to start capacitor, #2 to start winding, #5 to common winding
 - #1 to start winding, #2 to start capacitor, #5 to common winding
24. In an electrical circuit that has power applied to it, a volt meter measuring across a set of open contacts will read:
- Line voltage
 - 0 volts
 - Resistance
 - 50% of line voltage
25. When talking about electrical motors, PSC stands for:
- Permanent start components
 - Phase split capacitor
 - Permanent split capacitor
 - Permanent start capacitor
26. When talking about electrical motors, a split phase:
- Has no run capacitor
 - Has no start capacitor
 - Has a start winding
 - All of the above
27. The run capacitor will be electrically connected to the compressor at:
- Terminals R and C
 - Terminals R and S
 - Terminals C and S
 - Terminals 2 and 5 on the potential relay

28. The principal reason for double risers used in the suction line is that they:
- Assist in oil return to the compressor
 - Reduce refrigerant migration to the compressor
 - Reduce the amount of current drawn by the compressor
 - Increase the system's total capacity
29. Where in a refrigeration circuit would you find an oil separator?
- In the hot gas line
 - In the suction line
 - In the liquid line
 - any of the above
30. Where in a refrigeration circuit would you find a muffler?
- After the 4-way valve
 - Just before the metering device
 - In the hot gas line
 - In the liquid line
31. The purpose of a receiver can best be described:
- To protect the compressor from liquid flood-back
 - To assist in oil return to the compressor
 - To store excess liquid refrigerant in varying load conditions
 - To allow for refrigerant expansion
32. A start capacitor has a bleed resistor across it's terminals to:
- Help capacitor last longer
 - Increase MFD value of capacitor
 - Help stop electrical interference
 - To help prevent relay contact welding
33. Nominal CFM (Cubic Feet per Minute) per ton of air conditioning is:
- 100 CFM
 - 200 CFM
 - 400 CFM
 - 600 CFM

34. Excessive static pressure in an air conditioning duct system can cause:
- High evaporator temperature
 - Low evaporator temperature
 - Excessive air flow
 - High fan motor amps
35. Excessive static pressure in a forced air heating system can cause:
- Low temperature rise
 - High temperature rise
 - Excessive air flow
 - High fan motor amps
36. What instrument is used to measure static pressure drop across a cooling coil?
- Inclined manometer
 - Velometer
 - Mercury wanometer
 - Anemometer
37. On a spark ignition gas furnace, the spark ignites the pilot flame but continues to spark and the main valve will not open. Why?
- Flame rectification current is too low
 - Thermostat anticipation current is too low
 - Gas valve stuck open
 - Safety limit control open
38. The normal operating pressure on a natural gas fired furnace manifold is:
- 3.5 PSI
 - 11 PSI
 - 3.5 in. w.c.
 - 11 in. w.c.
 - 5 in. w.c.
39. Yellow tipped flames on a gas furnace is an indication of:
- A bad gas valve
 - High gas pressure
 - Low gas pressure
 - Incomplete combustion
 - Yellow tipping is normal

40. If the temperature rise across the heat exchanger of a gas furnace is too high, you should:
- Slow the blower down
 - Speed the blower up
 - Increase manifold pressure
 - Decrease manifold pressure
41. In a gas furnace, the secondary limit control is located:
- In the blower compartment
 - In the heat exchanger area
 - In the stack control
 - Gas furnaces don't have a secondary limit
42. If the heat anticipator in a thermostat used with an electrical warm air furnace fails to open, the result would be:
- Too short of a heat cycle
 - Too long of a heat cycle
 - Failure of the heat to come on
 - Failure of the heat to turn off
43. An accurate room-by room heat/loss gain calculation for a residential structure is necessary to determine proper:
- Duct placement
 - Supply air distribution
 - Indoor unit location
 - Thermostat and return air location
44. An electric warm air furnace has a sequencer that operates heat strips in which order:
- C - on; B - on; A - on; C - off/B - off; A - off
 - C - on; B - on; A - on; A - off/ B - off; C - off
 - A - on; B - on; C - on; A - off/ B - off; C - off
 - A - on; B - on; C - on; C - off/ B - off; A - off

QUIZ ANSWER KEY

1. C
2. B
3. D
4. D
5. A
6. B
7. C
8. C
9. D
10. A
11. D
12. C
13. C
14. A
15. B
16. False
17. D
18. D
19. A
20. C
21. B
22. D
23. D
24. A
25. C
26. D
27. B
28. A
29. A
30. C
31. C
32. D
33. C

34. B
35. B
36. A
37. A
38. C
39. D
40. B
41. A
42. C
43. B
44. D
45. D
46. C
47. #1 Compressor
#2 Muffler
#3 Accumulator
#2 Check vane
#5 Filter/driers
#6 TXV's
#7 Sensing element
#8 Four way (reversing) valve

Filling in the arrows correctly is a bonus!