

Chapter 2: The Refrigeration Process

TRUE/FALSE

1. Refrigerant can exist as both a liquid and vapor simultaneously.

ANS: T PTS: 1

2. As the pressure of a saturated refrigerant increases, its temperature decreases.

ANS: F PTS: 1

3. It is possible for a refrigerant to absorb heat at a low temperature and reject heat at a higher temperature.

ANS: T PTS: 1

4. An evaporator can also dehumidify the air in a building.

ANS: T PTS: 1

MULTIPLE CHOICE

1. The refrigeration process can best be described as the transferring of heat from an objectionable location to a place where the addition of this heat has _____ on the surrounding conditions.
- a. great effect
 - b. little or no effect
 - c. moderate effect
 - d. synthetic effect

ANS: B PTS: 1

2. The basic air conditioning system is made up of which four components?
- a. compressor, condenser, evaporator, receiver
 - b. compressor, accumulator, evaporator, metering device
 - c. compressor, condenser, evaporator, metering device
 - d. condenser, evaporator, metering device, filter drier

ANS: C PTS: 1

3. Which component in a refrigeration system performs the actual cooling or refrigeration?
- a. compressor
 - b. evaporator
 - c. condenser
 - d. metering device

ANS: B PTS: 1

4. Which component in a refrigeration system rejects the heat from the system?
- a. compressor
 - b. evaporator
 - c. condenser
 - d. metering device

ANS: C PTS: 1

5. Which component in a refrigeration system is responsible for raising the pressure and temperature of the vapor refrigerant that leaves the evaporator?
- a. compressor
 - b. evaporator
 - c. condenser
 - d. metering device

ANS: A PTS: 1

6. Which component in a refrigeration system is responsible for reducing the pressure in the system?
- a. compressor
 - b. evaporator
 - c. condenser
 - d. metering device

ANS: D PTS: 1

7. Which two types of heat can an evaporator remove from the air?
- a. radiant, conduction
 - b. sensible, radiant
 - c. latent, sensible
 - d. superheat, subcooling

ANS: C PTS: 1

8. The amount of heat added to a substance after it has been vaporized is called ____.
- a. subcooling
 - b. latent
 - c. superheat
 - d. radiant

ANS: C PTS: 1

9. Which type of compressor utilizes pistons, cylinders, and valves to accomplish the compression of the refrigerant?
- a. reciprocating
 - b. rotary
 - c. screw
 - d. scroll

ANS: A PTS: 1

10. Which type of compressor can be identified by its cylindrical shape and the fact that the discharge line is located in the center at the very top of the compressor?
- a. reciprocating
 - b. rotary
 - c. screw
 - d. scroll

ANS: B PTS: 1

11. Which type of compressor is reliant on the production of two perfectly machined spirals?
- a. reciprocating

- b. rotary
- c. screw
- d. scroll

ANS: D PTS: 1

12. Higher efficiency condensers can operate with saturation temperatures as low as ____ degrees F higher than the ambient air.
- a. 10
 - b. 20
 - c. 30
 - d. 40

ANS: B PTS: 1

13. The sensing bulb on a TEV is located at which part of the refrigeration system?
- a. outlet of the evaporator
 - b. inlet of the evaporator
 - c. inlet of the condenser
 - d. outlet of the condenser

ANS: A PTS: 1

14. Although it is no longer used in the manufacturing of new air conditioning systems, the number of existing systems using _____ is large, so technicians will be encountering this refrigerant for many years to come.
- a. R-22
 - b. R-12
 - c. R-410A
 - d. R-134a

ANS: A PTS: 1

15. Which refrigerant used in residential air conditioning has operating pressures that are about 40% to 70% higher than that of R-22?
- a. R-22
 - b. R-410A
 - c. R-134a
 - d. R-12

ANS: B PTS: 1

16. The refrigerant is pumped from the compressor to which component?
- a. condenser
 - b. evaporator
 - c. filter drier
 - d. metering device

ANS: A PTS: 1

17. The refrigerant enters the compressor from which component?
- a. evaporator
 - b. condenser
 - c. liquid line filter drier
 - d. metering device

ANS: A PTS: 1

18. On a properly operating system, what is the state of the refrigerant as it enters the compressor?
- a. high pressure vapor
 - b. low pressure vapor
 - c. low pressure liquid
 - d. high pressure liquid

ANS: B PTS: 1

19. On a properly operating system, what is the state of the refrigerant as it enters the condenser?
- a. high pressure vapor
 - b. low pressure vapor
 - c. low pressure liquid
 - d. high pressure liquid

ANS: A PTS: 1

20. On a properly operating system, what is the state of the refrigerant as it enters the metering device?
- a. high pressure vapor
 - b. low pressure vapor
 - c. high pressure liquid
 - d. low pressure liquid

ANS: C PTS: 1

21. On a properly operating system, what is the state of the refrigerant as it leaves the evaporator?
- a. high pressure vapor
 - b. low pressure vapor
 - c. high pressure liquid
 - d. low pressure liquid

ANS: B PTS: 1

SHORT ANSWER

1. Saturated refrigerants follow a _____ relationship.

ANS:
pressure/temperature

PTS: 1

2. List three types of metering devices used in refrigeration systems.

ANS:
1. capillary tube
2. automatic expansion valve
3. thermostatic expansion valve

PTS: 1

3. The bubble point temperature represents the temperature at which the _____ will appear in high pressure, high temperature liquid refrigerant. The bubble point temperature is used to calculate and determine the condenser _____.

ANS:

first bubble of vapor, subcooling

PTS: 1

4. The dewpoint temperature represents the temperature at which the _____ will appear in the low pressure, low temperature vapor refrigerant. The dewpoint is used to calculate and determine evaporator _____.

ANS:

first drop of liquid refrigerant, superheat

PTS: 1

5. _____ allow an air conditioning system to reject heat more effectively and efficiently.

ANS:

Larger condenser coils

PTS: 1