

## EXPANSION DEVICES MCQ

1- the purpose of the expansion device could be used as

- a- Reduce the pressure of the liquid refrigerant
- b- regulate the flow of refrigerant to the evaporator
- c- both a and b**

2- the most commonly type in expansion device were used

- a- The capillary tube and the float valve
- b- constant pressure valve and superheat controlled
- c- The capillary tube and superheat controlled**

3- the state where the evaporator results when the suction pressure rises and the capillary tube does not feed sufficient refrigerant to refrigerate the evaporator surface adequately.

- a- Starving**
- b- flooding
- c- balanced

4- the state where constant condensing pressure between the compressor and the capillary tube

- a- Starving
- b- flooding
- c- balanced**

5- Which of the following function is not performed by the expansion device?

- a- It reduces the high-pressure liquid refrigerant to low pressure liquid refrigerant
- b- It maintains the desired pressure difference between the high- and low-pressure sides of the system
- c- It controls the flow of refrigerant according to the load on the evaporator
- d- It compresses the vapor**

6- Compute the velocity of capillary tube (ID= 1.63mm) will drop the pressure of saturated liquid ref. 22 assume the flow rate 0.010 kg/s

Hint: density is 1128.5 kg/m<sup>3</sup>

a- 10.3 m/s

b- 8.5 m/s

c- 4.2 m/s

7- Compute the friction factor of the capillary tube ( ID= 1.63mm) will drop the pressure of saturated liquid ref. 22 assume the Reynold number is 42850

a-0.93

b-0.02

c-0.4

8. The purpose of expansion devices is twofold: \_\_\_\_\_.

a. It must reduce the pressure of liquid refrigerant and regulate the flow of refrigerant to evaporator.

b. It should direct the refrigerant from condenser to evaporator at constant pressure.

c. It will Increase the temperature of liquid refrigerant at constant pressure.

d. None of above choices.

9. \_\_\_\_\_ serves almost all small refrigeration systems, and its application extends up to refrigerating capacities of the order of 10 KW.

a. Constant –Pressure expansion device

b. Thermostatic expansion device

c. Capillary tube

d. All of above choices

10. \_\_\_\_\_ the evaporator results when the suction pressure rises and the capillary tube does not feed sufficient refrigerant to refrigerate the evaporator surface adequately.

- a. Flooding      b. starving
- c. Balanced of      d. none of previous choices

11. \_\_\_\_\_ the evaporator results when the suction pressure falls and the capillary tube can feed more refrigerant to the evaporator than the compressor can draw out.

- a. Flooding      b. starving      c. Balanced

d. none of previous choices

12. One of the disadvantages of capillary tubes is that they are \_\_\_\_\_ to changing load conditions.

- a. adjustable      b. adaptable      c. pliant

d. not adjustable

13. Use of \_\_\_\_\_ has been limited to systems of refrigerating capacity less than 30 kW, in which a critical charge of refrigerant is feasible to prevent liquid from flooding out of the evaporator.

- a. The constant –pressure expansion valve      b. capillary tubes
- b. Thermostatic expansion valve      d. the float valve

14. The most popular type of expansion device for moderate- sized refrigeration systems in superheat – controlled valve, usually called a \_\_\_\_\_.

- a. The constant –pressure expansion valve

b. capillary tubes

- c. Thermostatic expansion valve

d. the float valve

15. The controlling of thermostatic expansion valve is actuated by \_\_\_\_\_.

- a. The temperature in the evaporator
- b. The temperature in the condenser

c. The magnitude of superheat of the suction gas leaving the evaporator

d. None of above choices

16. In a refrigeration system, the expansion device is connected between the \_\_\_\_\_.

- a. compressor and condenser
- b. condenser and receiver
- d. receiver and evaporator
- d. evaporator and compressor

17. The capillary tube, as an expansion device, is used in \_ \_ \_ \_ \_.

- a. Domestic refrigerators
- b. Water coolers
- c. Room air-conditioning
- d. All of above applications

18. In a refrigeration system expansion device is connected between

- a) Compressor and condenser
- b) Receiver and evaporator
- c) Condenser and receiver
- d) Evaporator and compressor

19. Thermostatic expansion is used in ----- type of evaporator

- a) Flooded
- b) Dx coil
- c) Dry

20. The capillary tube used for small refrigeration systems limited to ----- refrigeration capacity

- a) 10
- b) 15
- c) 20
- d) 30

21. the capillary tube length -----with an inside diameter 0.5 mm to 2 mm

- a) 1 m to 6 m
- b) 2m to 6m
- c) 4m to 6m
- d) 1m to 2m

22. the inside diameter of capillary tube -----

- a) 1 mm to 2 mm
- b) 0.5 mm to 2 mm
- c) 0.5mm to 2m
- d) 0.5 mm to 1 mm

23. the pressure in capillary tube is decrease due to

- a) Frictional resistance offered by tube wall
- b) Acceleration of refrigerant in the tube
- c) Heat transferred from tube
- d) Both (a) and (b)

24. the thermostatic expansion valve is also called

- a) Constant pressure valve
- b) Constant temperature valve
- c) Constant superheated valve
- d) None of these

25. Most thermostatic expansion valve is set for a superheat of

- a) 5 C
- b) 10 C
- c) 15 C
- d) 20 C

26. The expansion device used with flooded evaporator are called

- a) Float valves
- b) Expansion valves

27. The types of superheat expansion valve are

- a) Internal equalizer
- b) external equalizer.
- c) constant equalizer
- d) above (a) and (b)

28. The basic function of the expansion device .....

- a- is to reduce pressure from condenser pressure to evaporator pressure
- b- is to regulate the refrigerant flow from the high-pressure liquid line into the evaporator at a rate equal to the evaporation rate in the evaporator
- c- Both b and c**
- d- None of the above

29. Which one the following is fixed opening type expansion device:

- a- Capillary tubes**
- b- b- Constant pressure expansion device
- c- thermostatic expansion device
- c- none of the stated

30. Which one of the following statements is correct?

- a- The compressor and the expansion device must arrive at suction and discharge conditions which allow the compressor to pump from the evaporator the same flow rate of refrigerant that the expansion device feeds the evaporator.
- b- The suction pressure can be fixed freely for the capillary tube.
- c- Both a and b
- d- None of the stated above

31. Evaporator starving means:

- a- The expansion device and compressor reach a balance point
- b- The flow rate of refrigerant is less than the need of heat transfer evaporation inside the evaporator.
- c- The flow rate of refrigerant is more than the need of heat transfer evaporation inside the evaporator.
- d- There is a risk of liquid flow into the compressor.

32. Slugging the compressor with liquid can be prevented by:

- a- Limiting the charge of refrigerant in the system using capillary tubes
- b- Using thermostatic expansion device
- c- Both a and b
- d- None of the above stated

33. The pressure reduction in a capillary tube occurs due to the following

- a- The refrigerant has to overcome the frictional resistance offered by tube walls. This leads to some pressure drop
- b- The liquid refrigerant flashes (evaporates) into mixture of liquid and vapor as its pressure reduces.
- c- Both a and c
- d- None of the stated

34. The constant pressure expansion valve senses:

- a- The temperature of refrigerant exiting the evaporator
- b- The pressure of the refrigerant in the condenser
- c- The pressure of the refrigerant in the evaporator
- d- None of the stated above

35. To maintain the evaporation temperature at a certain point we use:

- a- Constant pressure expansion valve
- b- Capillary tube
- c- Fixed opening tube
- d- Thermostatic expansion valve

36. Which of the following expansion valves uses a feeler bulb?

- a- Capillary tube
- b- Thermostatic expansion valve**
- c- Fixed opening valve
- d- None of the stated above

37. The following valve always establishes a balanced flow condition of flow between compressor and itself:

- a- Fixed opening valve
- b- Capillary tube
- c- Thermostatic expansion valve**
- d- None of the stated above

38. When the condenser pressure ( $p_{cond}$ ) increased the pressure difference increased so that the liquid refrigerant flow rate passes through expansion device increased while the vapor flow rate pumping by compressor .....

- a. decreased.**
- b. Increased
- c. Non a and b

39. When the evaporating pressure ( $p_{evap}$ ) increased the pressure difference decreased so that the liquid refrigerant mass flow rate through expansion decreased while the vapor flow rate through compressor .....

- a. decreased.
- b. Increased**
- c. Non a and b

40. When the evaporating pressure ( $p_{evap}$ ) decreased the pressure difference increased so that the liquid refrigerant mass flow rate through expansion device increased while the vapor flow rate through compressor .....

- a. decreased.**
- b. Increased
- c. Non a and b

41. When the outlet pressure of refrigerant reduced until the sonic velocity occurs at the throat it called .....

- a. **choked**
- b. **Balanced**
- c. **Starving**