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Courses » RAC Product Design

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Unit 4 - WEEK 2

Course outline

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  - Refrigerant Properties and Applications
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Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-09-05, 23:59 IST.

1) What are the items that would directly act as a source of ignition for flammable refrigerants in a compressor? ***1 point***

- [ ] Arcing at the terminal block of compressor
- [ ] Leakage through motor winding
- [ ] High Discharge gas temperature
- [ ] Condenser fan failure

No, the answer is incorrect.
Score: 0

Accepted Answers:
Arcing at the terminal block of compressor
Leakage through motor winding

2) What is/are condition(s) that lead to a refrigerant to ignite? ***1 point***

- [ ] flammable refrigerant
- [ ] oxygen
- [ ] spark
- [ ] none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
flammable refrigerant
oxygen
spark

3) Which refrigerant has been phased-out as defined in Montreal Protocol's article 5 ***1 point***

- Propane

No, the answer is incorrect.
Score: 0

Accepted Answers:
HCFC-22

4) In a P-h diagram of a refrigerant in a vapour compression cycle, which of the following statements hold true? ***1 point***

- The throttling process appears along vertical lines
- The constant pressure and constant temperature curves coincide in the liquid region.
- Super heating happens along the isothermal lines.
- The vapour concentration increases at the expansion valve outlet with increased subcooling

No, the answer is incorrect.
Score: 0

Accepted Answers:
The throttling process appears along vertical lines

5) Pick out the TRUE statements among the following ***1 point***

- Higher subcooling at condenser outlet will improve system EER if all other parameters are kept constant.
- COP is easier to be computed than EER for hermetic compressor.
- A higher condenser surface area would increase the compressor EER.
- A dusty environment has a positive impact on the compressor EER

No, the answer is incorrect.
Score: 0

Accepted Answers:
Higher subcooling at condenser outlet will improve system EER if all other parameters are kept constant
A higher condenser surface area would increase the compressor EER.

6) When selecting a compressor, a higher superheat temperature close to evaporating temperature range in a refrigeration system may change the operating envelope to allow: ***1 point***

- Higher maximum condenser temperatures
- Lower maximum condenser temperature
- Same max condenser temperature
- Insufficient information

No, the answer is incorrect.
Score: 0

Accepted Answers:
Lower maximum condenser temperature

7) The phenomenon where the response of the expansion valve diaphragm to the changing suction pressures is too rapid to prevent the system from reaching steady state is called ***1 point***

- Cycling
- Switching
- Wavering
- Hunting

No, the answer is incorrect.

Score: 0

Accepted Answers:
Hunting

8) Automatic expansion valve is used to maintain_____ in the evaporator. ***1 point***

- Constant Temperature (if pure refrigerant but not for mixtures)
- Constant Pressure
- Constant Volume
- Constant Entropy

No, the answer is incorrect.
Score: 0

Accepted Answers:
Constant Temperature (if pure refrigerant but not for mixtures)
Constant Pressure

9) TXV is used to maintain ***1 point***

- Constant degree of superheat
- Constant degree of subcooling
- Constant degree of subcooling and superheat
- Zero superheat

No, the answer is incorrect.
Score: 0

Accepted Answers:
Constant degree of superheat

10)Which design of the compressor is preferred for higher capacity RAC systems, where repair of compressor is important. ***1 point***

- Open
- Hermetic
- Semi hermetic

No, the answer is incorrect.
Score: 0

Accepted Answers:
Open
Semi hermetic

11)The capillary tube type expansion device is typically used in refrigeration systems of capacity: ***1 point***

- <5 TR
- >5 TR
- < 10 TR
- < 1 TR

No, the answer is incorrect.
Score: 0

Accepted Answers:
<5 TR

12)n a ref system, an expansion valve lowers the pressure and delivers ***1 point***

- Large amount of work
- Small amount of work
- No work output
- Higher enthalpy refrigerant
- Subcooled refrigerant

No, the answer is incorrect.
Score: 0

Accepted Answers:
No work output

13) Which of the following are current trends for developing new refrigerants? ***2 points***

- Low GWP and zero ODP
- Low ODP & zero GWP
- Low toxicity
- Exploration of A_2L synthetic refrigerants
- Revive use of Natural substances like CO_2, Ammonia, Propane etc.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Low GWP and zero ODP
Low toxicity
Exploration of A_2L synthetic refrigerants
Revive use of Natural substances like CO_2, Ammonia, Propane etc.

14) In domestic refrigerators, the move has been to which refrigerant(s)? ***2 points***

- R-600a
- HFC 134a
- R12
- R22

No, the answer is incorrect.
Score: 0

Accepted Answers:
R-600a
HFC 134a

15) Which of the following is true for MOP charge in Thermostatic Expansion valves: ***2 points***

- They are used for a wide range of evaporating temperatures
- The entire charge converts to vapor at a certain bulb temperature
- It limits overloading compressor at start up
- Anti-hunt charge has the same migration risk as that of an MOP charge

No, the answer is incorrect.
Score: 0

Accepted Answers:
The entire charge converts to vapor at a certain bulb temperature
It limits overloading compressor at start up

16) Which of the following statements are TRUE during Under-charging and Over-charging the refrigerant? ***2 points***

- [ ] Undercharging leads to most of the evaporator surface to remain unutilised for heat transfer.
- [ ] Overcharging would lead to excessive pressures in the system and overload the compressor.
- [ ] Undercharging, in some cases, may lead to cooling coil frosting and freezing.
- [ ] Overcharging may result in cooling coil running warm over part of its surface (suction side pressure too high).

No, the answer is incorrect.
Score: 0

Accepted Answers:
Undercharging leads to most of the evaporator surface to remain unutilised for heat transfer.
Overcharging would lead to excessive pressures in the system and overload the compressor.
Undercharging, in some cases, may lead to cooling coil frosting and freezing.
Overcharging may result in cooling coil running warm over part of its surface (suction side pressure too high).

17) Pickup the true statements among the following **2 points**

- [ ] Capillary type expansion devices ensure safety of compressors for large capacity systems
- [ ] External pressure equalization is recommended for a saturation temperature difference of >1K across the evaporator
- [ ] In a thermostatic expansion valve (TXV) with MOP feature it is preferred to have the TXV body at a higher temperature than the bulb
- [ ] A special pressure equalisation device is needed for capillary tube
- [ ] Considering the expansion Valve Cross Charge, it is desirable that, $(\partial P/\partial T)$ bulb charge > $(\partial P/\partial T)$ Evaporator refrigerant.
- [ ] Minimum stable superheat is determined by the type of expansion valve

No, the answer is incorrect.
Score: 0

Accepted Answers:
External pressure equalization is recommended for a saturation temperature difference of >1K across th evaporator
In a thermostatic expansion valve (TXV) with MOP feature it is preferred to have the TXV body at a high temperature than the bulb

18) A R134a Thermostatic Expansion Valve is set for a superheat of 6°C at evaporating temperature of (-)10°C. The degree of superheat of gas when evaporating temperature is (-) 20°C would be _____ °C.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 7,8.5

2 points

19) In Q.18, if there is frictional loss of 0.31 bar in evaporator, the actual degree of superheat would be _____ °C.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 13,14.5

3 points

20) An R22 TXV with R22 itself as the power fluid is not equipped with an external equalizer. It supplies a coil in which there is pressure drop due to friction. The superheat setting made on the valve at the factory is 5°C with evaporator at 0°C.
The pressure difference required (in kPa) on opposite sides,for the valve to open is_____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 68,104

2 points

21) In Q.20, when the pressure at the evaporator inlet is 4.22 bar & the pressure drop through the coil is 0.53 bar, the suction gas superheat (in degree Celsius) would be _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 8,12

3 points

22) In Q.20, if the valve had been equipped with an external equalizer, the degree of superheat would then be _____ °C.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4,8

3 points

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