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M.TECH

Total Number of Pages : 2

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018
ADVANCED REFRIGERATION ENGINEERING

Branch: TE, Subject Code:MTEPC1020

(Regulations 2018)

Time: 3 Hours

Max Marks : 70

Question Code: RD18002033

PART-A (10 X 2=20 Marks)

1. Answer the following questions.

- Define a tonne of refrigeration.
- Name different types of systems used for cooling aircraft cabin?
- What do you mean by Triple point?
- Differentiate between Relative humidity and Specific humidity.
- Write at least one advantage and disadvantage of capillary tube over expansion valve.
- Discuss the advantages of compound compression with intercooler over single stage compression.
- Why specific the specific heat of refrigerant vapour should be high? Explain
- What is a power fluid in a thermostatic expansion valve?
- What do you understand by evaporative cooling?
- What defrosting capacity control in refrigeration system low?

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

- 2.a) In a vapor compression refrigeration system using R-12, the evaporator pressure is 1.4 bar [5]
and the condenser pressure is 8 bar. The refrigerant leaves the condenser sub-cooled to 30°C.
The vapor leaving the evaporator is dry and saturated. The compression process is isentropic.
The amount of heat rejected in the condenser is 13.42 MJ/min. Determine:
- Refrigerating capacity
 - Refrigerating load in TR
 - Compressor input in kW
 - C.O.P
- b) Discuss the advantages of vapour absorption system over compression refrigeration system. [5]
- 3.a) Explain the lubrication system in refrigeration plant? [5]
b) Explain all methods dehumidification processes of air conditioning system? [5]
- 4.a) Explain the working of Claude liquefaction system with suitable sketch. [5]
b) Explain the Joule- Thompson coefficient. What do you mean by inversion temperature? [5]
Mention the inversion temperatures of few cryogenic fluids.
5. A building has the following calculated cooling loads.
RSH gain = 310 kw
RLH gain=100 kw
The space is maintains at DBT=27°C and RH =60%.The outside air is at 35°C and 80°C
RH.10% by mass of supplied to the building is outdoor air. If the air supplied to the space is [5]
not be at a temperature lower than 18°C, find: [5]
- Minimum amount of air supplied to the space in m³/s.
 - Capacity, ADP, BPF and SHF of the cooling coil.



- 6.a) In a single stage saturation R-22 refrigeration cycle works between -15°C and 45°C . The compressor has 4 cylinders, each with a bore of 10 cm and stroke of 11.5 cm, clearance volume ratio is 0.04 and it runs at 750 rpm. Find the mass flow rate and the refrigerating capacity. [8]
[2]
- b) Write down the properties of an ideal refrigerant.
- 7.a) Describe Ejector Refrigeration System. [5]
b) Explain the thermal design consideration of condensers used in refrigeration plants. [5]
8. Write short notes on
- a) Magnetic Refrigeration Principle [5]
b) Miscibility of Lubricating Oil with Refrigerant [5]

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