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6371

Reg. No. :

Name :

**Second Semester M.Tech. Degree Examination, September 2015
(2013 Scheme)**

**Branch : Mechanical Engineering
MTE 2004 : REFRIGERATION ENGINEERING**

Time : 3 Hours

Max. Marks : 60

Instructions : 1) Use of Refrigeration Tables **allowed**.

2) Answer **two** full questions from **each** Module

3) **Each** question carries **10** marks.



MODULE – I

1. a) A refrigeration system using R 134a as refrigerant maintains the evaporator and condenser at -10°C and 40°C . The refrigerant at the exit of the evaporator is superheated by 5°C by using a Liquid Suction Heat Exchanger. Calculate :
 - i) COP,
 - ii) Heat rejected at the condenser per minute and
 - iii) Power of the compressor if the capacity of the system is 10TR. 5
- b) Explain the working of a refrigeration system with one compressor, one condenser and two evaporators at -10°C and -20°C . Also sketch it p-h diagram. 5
2. What are the various types of expansion devices used in refrigeration ? Explain the working of a thermo-static expansion valve with a neat diagram. 10
3. Write short notes on :
 - a) Multipressure vapor compression system
 - b) Flash gas removal
 - c) Low temperature refrigeration. 10



MODULE – II

4. a) What are the energy sources adopted in vapour absorption refrigeration system ? Explain. 6
- b) An $\text{NH}_3 - \text{H}_2\text{O}$ VARS maintains the evaporator, generator and condenser at -20°C , 150°C and 30°C respectively. Calculate the COP of the system. 4
5. a) Explain the working of a refrigeration system using magnetic cooling. Show its T-S diagram. 6
- b) Explain the criteria for the selection of refrigerant-absorbent combinations. 4
6. Explain the working of a simple Linde-Hampson liquefaction system. Obtain expressions for its liquid yield and work requirement. 10

MODULE – III

7. a) Discuss the environmental effect of various conventional refrigerants. 6
- b) Explain the concept of mixed refrigerants. 4
8. a) Explain the working of a pulse tube refrigeration system. 5
- b) Explain with a sketch, the working of vapor jet refrigeration system. 5
9. Discuss the procedure for design of a capillary tube using refrigerant R-11 for a pressure drop of 10 bar. 10