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Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, November 2015
(2008 Scheme)**

08.704 : REFRIGERATION AND AIR CONDITIONING (M)

Time : 3 Hours

Max. Marks : 100

- Instructions :**
- 1) Illustrate your answers with **neat sketches wherever necessary.**
 - 2) Use of Thermodynamic charts and table **permitted.**
 - 3) Assume **suitable data if necessary.**

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. Define Tonne of Refrigeration (TR). Convert 1 TR to kW.
2. Derive the Carnot COP for any refrigerator and compare it with those of Heat Engine and Heat Pump.
3. Explain a simple refrigeration system for aircrafts.
4. How Vortex Tube refrigeration is significant in certain areas ? What is its working principle ?
5. In what respect super-heating and subcooling is significant in Vapor compression systems ?
6. What is the scope of Electrolux refrigerator at present ? Is it efficient as Vapor compression system.
7. What do you mean by quick freezing ? How do you apply that in preservation of meat products ?
8. Comment on the following terms in Psychrometry :
 - i) Saturated and unsaturated air.
 - ii) Relative humidity and Degree of saturation.
 - iii) Dew point and Wet bulb temperatures and
 - iv) RSHF and GSHF lines.



P.T.O.



9. How effective temperature is significant in designing air conditioning systems? Draw a comfort chart.
10. Specify on the configurational differences among summer, winter and year-round air conditioning.

PART – B

Answer **any one** question from **each** Module. **Each** question carries **20** marks.

Module – I

11. In a refrigerator, R134a enters the compressor as super-heated vapor at 0.14 MPa and -12°C at a rate of 0.076 kg/s and leaves at 1 MPa and 70°C . The refrigerant is cooled in the condenser to 36°C and 1 MPa and is throttled to 0.15 MPa. Ignore any heat transfer and pressure drop in connecting lines, determine the following.
 - a) Rate of heat removal in the evaporator, b) Power input to the compressor,
 - c) Isentropic efficiency of the compressor and d) COP of the system.

OR

12. a) Explain the concepts of flash intercooling and flash gas removal in vapor compression system.
 - b) Specify the importance of multi-stage compression and multi-evaporator systems in refrigeration.

Module – II

13. a) How does an vapor absorption refrigeration system produce cooling ? Describe its components.
 - b) Describe the application of refrigeration in Ice plants and cold storages.

OR

14. a) There are different properties that are important while selecting a refrigerant. Comment.
 - b) How do you detect the leak of refrigerant in refrigeration systems ?

Module – III

15. Describe in detail about Unitary, Split and Centralized air conditioning systems with diagrams.

OR

16. What are the factors that need to be considered in Hospital and cinema theatre ?
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