

1st M.Tech Regular/Back Examination 2015-16

Advanced Refrigeration Engineering

Q.CODE-T1087

FM 70

Time 3 Hrs

Use of Refrigerant tables and charts is allowed

Answer any SIX including Q1.

Q1. A) Define the following

2X5

- i) Ton of Refrigeration
- ii) Wire drawing effect
- iii) Eutectic point
- iv) Thompson effect of current while passing through the semiconductors
- v) Raoult's Law

b) State the reasons

2x5

- i) High dielectric strength is desirable for a refrigerant.
- ii) Hydrogen gas is used in an Electrolux refrigeration system.
- iii) The COP of a vapour absorption refrigeration system is very low.
- iv) Capillary tube is used for a low capacity refrigeration system.
- v) Sudden expansion causes cooling.

Q2. 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. 10

Q3. Discuss the process of producing solid Carbon Dioxide 10

Q4. Why Multistaging is required for low temperature refrigeration system. Discuss different methods of intercooling. 4+6

Q5. Derive an expression for the COP of a Thermoelectric refrigeration system and mention the importance of Figure of Merit. 6+4

Q6. What is the importance of Joules-Thompson coefficient? Discuss the Linde Air Liquification cycle. 4+6

Q7. A) Write the working principle of a thermostatic expansion valve. 5

B) Discuss the property 'Miscibility of Lubricating Oil with Refrigerant'. 5

Q8. Write notes on

a) Vortex Tube refrigeration system 4

b) Magnetic refrigeration system 4

c) Azeotropic mixture 2