

IV B.Tech I Semester Supplementary Examinations, November 2005
REFRIGERATION & AIR CONDITIONING
(Mechanical Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) How is ideal reversed Carnot cycle modified to result in Bell-Coleman cycle?
Explain with sketches. [5]
(b) The capacity of a refrigerator is 150 TR when working between -6°C and 25°C . Determine the mass of ice produced per day from water at 25°C . Also find the power required to drive the unit. Assume that the cycle operates on reversed Carnot cycle. Latent heat of ice can be taken as 335 kJ/kg. [11]
2. (a) What are the merits and demerits of vapour compression systems over vapour absorption systems? [6]
(b) Explain the working of a simple vapour compression system with the help of a schematic diagram. [10]
3. (a) Explain the working of a rotary screw compressor. [10]
(b) How the capacity control is achieved in refrigerant compressor? [6]
4. (a) Explain the working of an automatic expansion valve with the help of a neat sketch. [8]
(b) Describe the working of shell and tube type and shell and coil type evaporators. [8]
5. (a) Explain the limitations of Lithium bromide-water vapour absorption refrigeration system. [4]
(b) Explain the working of a four shell Lithium bromide-water vapour absorption refrigeration system. [12]
6. In a Steam jet refrigeration system dry saturated steam at 7 bar abs. pressure is supplied. The flash chamber temperature is 5°C , the condenser temperature is 40°C , make up water is supplied at 20°C . Assuming that quality of motive steam and flash vapour at the beginning of compression as 93% dry and efficiency of the nozzle, efficiency of expansion and the efficiency of the thermo-compressor as 90%, 65% and 91% respectively. Determine:
(a) Weight of steam required per hour per ton of refrigeration.
(b) The volume of vapour removed from the flash chamber per hour per ton of refrigeration. [16]
7. Explain in detail the various features of "Heating load estimate" in air conditioning applications. [16]

8. (a) With a neat diagram explain the spray type of dehumidifier. [8]
- (b) Describe the advantages and disadvantages of spray type dehumidifier over coil type dehumidifier. [8]

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