4. a) Derive an expression for clearance volumetric efficiency of a reciprocating compressor.

   b) Discuss briefly the various methods used for capacity control of reciprocating compression.

5. a) Discuss the factors which are considered for selecting a condenser in a refrigerating system.

   b) Describe with neat sketch working of a thermostatic expansion valve.

6. a) Define refrigerant. Name three refrigerant that are commonly used in commercial refrigerator. Discuss them merit and demerit.

   b) Explain the working of vapour absorption system.

7. a) State the limitations of vapour compression system for production of low temperatures.

   b) Describe briefly the method for liquefaction of hydrogen.

8. Write short notes on any four.

   i) Advantages of Air refrigeration system

   ii) Flash intercooler and oil separator of refrigeration system

   iii) Azeotropic mixture refrigerant

   iv) Solar powered refrigeration system

   v) Heat pump

   vi) Cryogenic refrigerant.

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Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MMTP - 203

M.E./M.Tech., II Semester

Examination, June 2014

Advance Refrigeration Systems

Time : Three Hours

Maximum Marks : 70

Note : Attempt any five questions out of eight. All questions carry equal marks. Use of refrigerant properties table and chart is permitted. Assume suitable missing data, if any.

1. a) Explain different methods of refrigeration that can be used for production of cooling.

   b) A manufactures has supplied a two ton refrigeration system to cool 400 litres of water in an hour for drinking purposes from 30° to 10°C. Where the supplier in justifiable.

2. A vapour compression refrigeration system operates between the evaporating temperature and condensing temperature of 258 K and 313 K respectively. Calculate (i) tonnage (ii) volume handled by compressor (iii) C.O.P and (iv) Heat transfer to condenser. The refrigerant used is R-22 and vapour is dry and saturated at the inlet to compressor.

3. a) What do you mean by multistage refrigeration system? What are its advantages?

   b) Explain by flow diagram and p-n chart, the two evaporaters at different temperatures with compound compression and perfect intercooling vapour compression refrigeration system.