

Roll No

MMTP - 203

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

Examination, June 2016

Advance Refrigeration Systems

Time : Three Hours

Maximum Marks : 70

- Note:** i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Draw neat diagrams wherever required.

1. a) What is the effect of liquid sub cooling on refrigerating capacity of a system? Draw temperature entropy diagram for simple air-craft refrigeration cycle with ram compression.
b) Will there be any effect on the performance of Carnot refrigerator when season changes from winter to summer? Explain.
2. a) Discuss the working of multi pressure refrigeration system with flash chamber and inter-cooling with neat diagram.
b) What do you understand by pure and mixed refrigerants? Discuss their properties and selection in brief.
3. a) Give the classification of the compressors used in refrigeration system.
b) With the help of a neat sketch explain the working of automatic expansion valve. Will it work satisfactory under changing load conditions?

4. a) Discuss thermal design considerations of centrifugal compressor.
b) Classify expansion devices used in refrigeration. Explain working of capillary.
5. a) What is Hermetically shield compressor? State its properties.
b) What is the difference between refrigerator and heat pump? Derive an expression for the performance factor for both if they are running on reversed Carnot cycle.
6. a) Discuss types of condensers used now a day in advanced refrigeration system with neat sketch.
b) What is Evaporator? How its performance can be evaluated? Discuss.
7. A refrigeration system using R-12 as a refrigerant consists of three evaporators of capacity 20 TR at -10°C , 30 TR at 5°C and 10 TR at 10°C . The vapours leaving the three evaporators are dry and saturated. The system is provided with individual compressors and multiple expansion valves. The condenser temperature is 40°C and the liquid refrigerant leaving the condenser is sub-cooled to 30°C . Assuming isentropic compression in each compressor, determine:
a) The mass of refrigerant flowing through each evaporator.
b) The power required to drive the system
c) The COP of the system
8. Write short note on following: (Any two)
a) Oil separators
b) Absorbent combinations
c) Solar powered refrigeration
