Question bank of RAC

B.Tech (3rd year, ME)

Unit 1

1) Describe a cold storage in brief? What factors are considered in design of a cold storage
2) Write the function of compressor in refrigeration system? What do you understand by hermetic sealed compressors give its advantages with diagram.
3) What is the function of Cold storages and what is their importance in today's life? 2000 tonnes of potato are available at a temperature of 30 °C. It has to be preserved in a cold storage at a temperature of 2°C. How much refrigeration is necessary? If this refrigeration is to be obtained in 3days, what should be the capacity of the plant?
4) A cold storage is to be maintained at -5°C while the surroundings are at 35°C. The heat leakage fromthe surroundings into the cold storage is estimated to be 29 kW. The actual COP of the refrigeration plant is one-third of an ideal plant working between the same temperatures.Find the power required to drive the plant.
5) Explain the COP of reversed carnot cycle and also writes the method of refrigeration.

Unit 2

1) Attempt the following:
   (1)What are the desirable properties of an ideal refrigerant?
   (2)Discuss in detail, the secondary refrigerants.
2) Answer the following:
   a)Discuss the effect of variation of condenser and evaporator pressures and sub-cooling of condensate on COP of a vapour compression refrigeration system.
   b)Discuss the applications of flash chamber with the help of P-h chart and schematic diagrams.
3) What are the different types of expansion devices generally used in refrigeration system?Describe thermostatic expansion valve with neat sketch.
4) Explain three stage compressions with flash intercoolers with p-h diagram.
5) In a vapour compression refrigeration system using R-12, the evaporator pressure is 1.4bar and the condenser pressure is 8 bar. The refrigerant leaves the condenser sub- cooledto 30_oC. The vapour leaving the evaporator is dry and saturated. The compressionprocess is isentropic. The amount of heat rejected in the condenser is 13.42 MJ/min.Determine: 1) refrigerating effect in kJ/kg, 2) refrigerating load in TR, and 3) C.O.P.

6) What is multi-stage vapour compression refrigeration system? Compare it with cascade refrigeration system. Explain advantages and disadvantages over simple vapour compression system.

7) What do you mean by cascade refrigeration system, writes its COP?

Unit 3

1) Draw a neat labelled sketch of a Practical Vapour Absorption refrigeration cycle and explain its working in brief.
2) Explain Li-Br vapour absorption refrigeration system with neat sketch.
3) Explain the function of the following components of the Vapour Absorption Refrigeration System.
    a. Rectifier
    b. Generator
    c. Analyser
    d. Absorber
4) Explain the ozone layer depletion and global warming.
5) How are refrigerants classified? What are the desirable properties of refrigerants? Name some common refrigerants generally used in refrigeration system?

Unit 4

1) What is psychrometric chart? With the help of psychrometric chart describe the following process
    1)Cooling and dehumidification
    2)Heating and humidification
2) Define the terms:
    i. Dew point temperature
    ii. Specific humidity
    iii. Relative humidity
    iv. Degree of saturation
3) Air at 15 ^{0}C dry bulb temperature and 25% relative humidity is heated and humidified at 30 ^{0}C dry bulb temperature and 50% relative humidity. Calculate the heat and moisture added to air and the sensible heat factor for the process.
4) Explain Bell-Coleman cycle with P-V and T-S diagrams and derive its COP.
5) Explain, with a neat sketch, the working principle of boot-strap type of air refrigeration system with T-S diagram.

Unit 5

1) What are the different types of expansion devices generally used in refrigeration system? Describe thermostatic expansion valve with neat sketch.
2) Write the functions of capillary tube.

3) Differentiate open and closed air refrigeration system.
4) Describe a cold storage in brief? What factors are considered in design of a cold storage?
5) Write the function of compressor in refrigeration system? What do you understand by hermetic sealed compressors give its advantages with diagram.
6) Describe Electrolux refrigeration system with the help of neat sketches.
7) Explain the Performance Characteristics of Reciprocating Compressor mentioning the effect of the following points :-

Suction temperature on compressor on refrigerating capacity.

- Condenser temperature.

8) Define Condenser and explain the working of a Condenser in a Refrigerating System. Classify them. Also discuss what are the factors affecting the Condenser Capacity.
9) What is the basic difference between the requirements for Comfort and Industrial air conditioning? Explain in brief, the factor affecting Comfort air conditioning.
10) Discuss thermal analysis of human body.