

Chapter - 1 Air Refrigeration Cycle.

2 marks

1. Define tonne of refrigeration.
2. What is the difference between a refrigerator and a heat pump?
3. Define COP.
4. Give two applications of air refrigeration cycle.
5. Show the processes of Bell-Coleman cycle P-V and T-s diagram.

5 marks

1. State the advantages of dense air refrigerating system over an open air refrigerating system.

10 marks

1. A machine working on a Carnot cycle operates between 305k and 260k. Determine the COP when it is operated as
 - i. A Refrigerating machine
 - ii. A heat pump
 - iii. A heat engine.

Chapter – 2 Simple Vapour compression refrigeration system

2 marks

1. What is sub cooling and super heating?
2. Sketch the T-s and p-h diagram for the VCRS, when the vapour after compression is dry saturated.

5 marks

1. Mention the advantages of vapour compression refrigeration system over air refrigeration system.
2. Name the components of VCRS system with their function.

10 marks.

1. Describe the mechanism of a simple vapour compression refrigeration system.
2. In an ammonia vapour compression system, the pressure in the evaporator is 2 bar. Ammonia at the exit is 0.85 dry and at the entry its dryness fraction is 0.19. During compression, the work

[1]

done per kg of ammonia is 150 kJ. Calculate the COP and the volume of vapour entering the compressor per minute, if the rate of ammonia circulation is 4.5 kg /min. The latent heat and specific volume at 2 bar are 1325 KJ/kg and 0.58 m³/kg respectively.

Chapter 3- Vapour Absorption Refrigeraton System

2 marks

1. Write the components of VARS system.
2. Name the refrigerants commonly used in VARS systems.
3. Give two advantages of VARS over VCRS.
4. Write two applications of VARS system.

5 marks

1. What is the basic function of a compressor in VCRS system? How this function is achieved in VARS?
2. Write the function of following components in VARS System
 - a. Absorber
 - b. Rectifier
 - c. Heat Exchanger
 - d. Analyser
3. Discuss the advantages of VARS over VCRS.

10 Marks

1. With a neat sketch, describe about practical Vapour Absorption Refrigeration cycle.
2. Derive an expression of Ideal VARS system..

Chapter-4- Refrigeration Equipments

2 marks

1. Draw P-V diagram for a reciprocating compressor.
2. What is the effect of clearance volume on a reciprocating compressor?
3. What is hermetically sealed compressor?
4. What is the function of a condenser in a refrigeration system?

[2]

5. What is Heat rejection ratio?
6. What is the function of an evaporator in a refrigeration System?

5 marks

1. Write a short note on refrigeration compressors.
2. What are the advantages & disadvantages of Centrifugal compressors over reciprocating compressor?
3. Give comparison of air cooled & water cooled condenser.
4. Write a short note on cooling Towers.
5. Explain dry expansion evaporator with a neat sketch.

10 marks

1. Explain with a neat sketch, the principle of operation of a single stage, single acting, reciprocating compressor.
2. Explain the working of a single stationary type rotary compressor.
3. Describe with a sketch, a centrifugal compressor. Where are centrifugal compressors preferred over reciprocating compressor in refrigeration system?
4. Give the main types of condensers used with specific application of each type.
5. Describe with a neat sketch, the working of a Shell & coil condenser and a shell and tube condenser.
6. Describe forced convection evaporater & give its field of application.

Chapter-5 Refrigerant Flow Controls, Refrigerant And Applications

2 marks

1. What is the function of a capillary tube in a refrigeration system?
2. Why capillary tube is preferred over other throttling devices?
3. What is the function of expansion device in a refrigerating system?
4. Why thermostatic expansion valve is called constant superheat valve?
5. Name different refrigerants commonly used.

5 marks

1. What are the desirable properties of an ideal refrigerant?
2. Write short note on R-12 and R-22 as a refrigerant
3. What is an azeotrope? Give some examples to indicate its importance.
4. What are the thermodynamic properties of a refrigerant?
5. Write a short note on secondary refrigerants.

10 marks

1. Explain the working principle of thermostatic expansion valve with neat diagram.
2. Explain the working of automatic expansion valve. Why it is called as constant pressure expansion valve?
3. How will you assign number to the refrigerants methyl chloride and tetra-chloro-ethane ?

Chapter 6 Psychrometrics And Comfort Air Conditioning Systems

2 marks

1. What do you understand by psychrometry?
2. Define relative humidity.
3. Define dew point temperature.
4. What is wet bulb temperature?
5. What is dehumidification?
6. Define sensible heat factor.
7. Define BPF.

5 marks

1. What is a sling psychrometer? Make a neat sketch and explain its use.
2. Explain adiabatic mixing with suitable figure.
3. Sketch comfort chart and show comfort zone on it.

10 marks

1. A sling psychrometer reads 40 °C dry bulb temperature and 28°C wet bulb temperature. Calculate

[4]

- a. Specific humidity
 - b. Relative humidity bulb
 - c. Vapour density in air
 - d. Dew point temperature
 - e. Enthalpy of mixture per kg of dry air.
2. What is effective temperature? What factors affect effective temperature?
 3. Discuss briefly the factors which govern the optimum effective temperature for comfort.

Chapter-7 Air conditioning system

2 marks

1. Name equipments used in air-conditioning system.
2. Define room sensible heat factor.
3. Give classification of air- conditioning system

5 marks

1. Write short note on factors affecting comfort air conditioning.
2. Differentiate between winter air conditioning & summer air for conditioning

10 marks

1. Draw a neat diagram of air-conditioning system required for winter season. Explain the working of different components in the circuit.