

# **32083 – REFRIGERATION & AIR CONDITIONING**

## **1. REFRIGERATION SYSTEM AND REFRIGERATION EQUIPMENTS**

### **Part – A & Part - B**

1. What is refrigeration?
2. What is pure substance?
3. Define ton of refrigeration?
4. Define conduction?
5. Explain Fourier's law of heat conduction?
6. What are the modes of heat transfer?
7. What are the mechanisms of production of cold?
8. What is compressor?
9. What are the classifications of condenser?
10. Compare water cooled and air cooled condenser?
11. What is evaporator?
12. Types of refrigeration?
13. Compare sealed and semi sealed compressor?
14. What is condenser?
15. Compare natural draft and forced draft?

### **Part –C**

1. Explain the working principle of steam jet and thermo electric refrigeration?
2. Explain vapour compression and vapour absorption system?
3. Explain construction and working principle of any two rotary compressors?
4. Explain shell and tube condenser and shell and coil condenser?
5. Explain working principle of natural and forced circulation type evaporators?
6. Explain natural and forced draught cooling tower?

## **2. VAPOUR COMPRESSION REFRIGERATION SYSTEM, VAPOUR ABSORPTION REFRIGERATION SYSTEM AND CRYOGENIC REFRIGERATION SYSTEMS**

### **Part – A & Part - B**

1. Define the term refrigeration effect?
2. Define COP?
3. Draw the p-V and T-s diagram for vapour compression system?
4. What are the effects of superheating?
5. What is accumulator?
6. Explain sub cooling?
7. What are the advantages of super heating?
8. State the limitation of vapour absorption system?
9. What is cryogenics?

## **32083 – REFRIGERATION & AIR CONDITIONING**

10. What is cryogenic refrigeration?
11. Name any two cryogenic refrigerants?
12. How will you classify cryogenic refrigerators?
13. Application of cryogenic refrigeration?
14. What are the applications of magnetic refrigeration?
15. Effects of under cooling?

### **Part –C**

1. Explain the working principle of Electrolux system?
2. Explain vapour compression and vapour absorption system?
3. Explain construction and working principle of refrigerators for above 2k Philips refrigerator?
4. Explain giffered McMohan refrigerator?
5. Find the theoretical COP for a CO<sub>2</sub> machine working between the temperatures of 25°C and 4°C.the dryness fraction of CO<sub>2</sub> gas during the suction stroke is 0.6?
6. A vapour compression refrigerator uses refrigerant R40 and operates between temperature limits of -10°C and 45°C.at entry to the compressor, the refrigerant is dry saturated and after compression it acquires a temperature of 60°C. find the COP of the refrigerator?

### **3. REFRIGERATION FLOW CONTROLS, REFRIGERANTS AND LUBRICANTS AND APPLICATIONS OF REFRIGERATION**

#### **Part – A & Part – B**

1. What is the purpose of expansion device?
2. Define capillary tube?
3. What is solenoid valve?
4. What is thermostatic expansion valve?
5. What are the advantages of capillary tube?
6. What is suction pressure regulator?
7. State five desirable properties of an ideal refrigerant?
8. Name three refrigerants that are commonly used in commercial refrigerators?
9. What are the properties of good lubricating oil?
10. What is slow freezing?
11. What is frozen storage?
12. What is milk cooler?
13. What is frost free refrigerator?
14. What is cold storage?
15. What is dairy refrigeration?

## **32083 – REFRIGERATION & AIR CONDITIONING**

### **Part – C**

1. Explain the working principle of thermostatic expansion valve with neat sketch?
2. Explain the working of storage type water cooler with a simple sketch?
3. Explain the solenoid valve with neat sketch?
4. Explain dairy refrigeration?
5. Explain any two types of quick freezing?
6. Explain milk cooler with neat sketch?
7. Explain frost free refrigeration?

### **4. PSYCHOMETRICS AND COMFORT AIR CONDITIONING SYSTEMS**

#### **Part – A & Part – B**

1. Define psychrometry?
2. What is moist air?
3. What is DBT?
4. Define Avogadro's law?
5. What is WBT?
6. What is DPT?
7. What is specific humidity?
8. What is absolute humidity?
9. Define degree of saturation?
10. What is sensible heating?
11. Name the different psychrometric process?
12. What is sensible heat factor?
13. Define registers and grills?
14. What are the properties of an ideal insulator?
15. What is an air filter?

#### **Part – C**

1. Explain the heating and humidification psychrometric process?
2. Explain the working of an air washer humidifier with neat sketch?
3. Explain any four psychrometric process?
4. Explain window type air conditioner?
5. List out the factors governing optimum, effective temperature in comfort air conditioning?
6. Define effective temperature and discuss the factors affecting optimum effective temperature?
7. Moist air enters a cooling coil at 35°C DBT 55%RH at the rate of 100m<sup>3</sup>/min. if the surface temperature of the cooling coil is 10°C and the bypass factor is 0.1. calculate the tones of refrigeration required and the condensate flow?

## **32083 – REFRIGERATION & AIR CONDITIONING**

---

### **5. COOLING LOAD CALCULATIONS AND DUCT DESIGN, ENERGY CONSERVATION TECHNIQUES**

#### **Part – A & Part - B**

1. What is cooling load?
2. What is fresh air?
3. What is the conduction heat load?
4. Define duct?
5. What is static pressure with respect to duct systems?
6. List out few advantages of absorption water chillers?
7. Define air handling unit?
8. Define terminal unit?
9. List out the components of AHU?
10. Define VPF?
11. Define VRF?
12. What is an ice builder?
13. What is thermal storage?
14. Name any two methods used in duct design?
15. Define energy conservation?

#### **Part – C**

1. Explain types of duct systems and their applications?
2. Explain the working of central A/C system with neat sketch?
3. Explain different types of heat sources?
4. Explain air handling unit?
5. Explain ice builder and ice harvester?
6. Explain VRF with neat sketch?
7. Discuss various loads to be considered in calculating cooling load?