R-13
Mech-8

5TH SEM./MECHANICAL / DIP. IN MECH./MECH(MAIN) /MECH(PROD)/MECH(SAND)/MECH(IND. INT)/ 2024(W)

TH5 REFRIGERATION & AIR CONDITIONING

Full Marks: 80 **Time- 3 Hrs**

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks
Use of Refrigerant table and psychrometric charts are allowed

1. Answer **All** questions 2 x10
   a. Define tonne of Refrigeration.
   b. What are the different types of evaporators?
   c. What is Wet-bulb temperature?
   d. Give the chemical formula and names of the refrigerant R-22 and R-12.
   e. What are the equipment used in an air-conditioning system?
   f. What is moist air?
   g. What is the function of spray pond ?
   h. What is the function of condenser in a refrigeration system.
   i. Define COP of refrigerator
   j. Define sensible heat factor.

2. Answer **Any Six** Questions 5 X 6
   a. Write a short note on the factors affecting comfort air conditioning.
   b. Enumerates the desirable properties of an ideal refrigerant.
   c. A machine working on a carnot cycle operates between 305k and 260k. Determine the C.O.P when it is operated as (1) a refrigerating machine (2) a heat pump
   d. With the help of psychrometric chart explain sensible cooling and sensible heating.
   e. Draw a neat sketch of capillary tube and explain its working in a refrigeration system.
   f. Describe winter air conditioning system.
   g. Explain the working of single acting reciprocating air compressor with suitable diagram.

Answer **Any Three** Questions

3. Draw P-V and T-S diagram for Bell-Coleman cycle and derive the expression for its C.O.P. 10

4. With neat sketch, describe the practical vapour absorption refrigeration system. 10

5. The humidity ratio of atmospheric air at 28^{0c} dry bulb temperature and 760mm of mercury is 0.016 kg/kg of dry air. Determine 2 X 5
   (i)Partial pressure of water vapour. (ii)Relative humidity
   (iii)Dew point temperature (iv) Specific enthalpy
   (v) Vapour density

6. Compare between vapour compression refrigeration system and vapour absorption refrigeration system. 10

7. Write short notes on 5+5
   (a) Bare tube coil evaporator (b) Cooling Tower