Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA ENGG.- VIth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 361907/2361907 **Date: 30/05/2012**

Subject Name: Refrigeration and Air Conditioning

Time: 10:30 am – 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **English version is considered to be Authentic**

Q.1 (a) Explain Refrigeration and Air Conditioning. Mention Industrial as well Domestic Application for both terms. **07**

(b) What is Importance of Insulation ? What are the factors to be considerd for selection of Insulating Material ? **07**

Q.2

(a) Describe in brief Packaged Air Conditioning Plant **07**

(b) Using Psychrometric table, calculate enthalpy of moist air having DBT 30 ^{0}C. **07**

OR

(b) Using Psychrometric table, find the properties of humid air whose DBT is 30 ^{0}C and WBT is 21 ^{0}C **07**

Q.3

(a) Explain with the help of P-h chart, "the factors affecting on the performance of vapour compression system" **07**

(b) A refrigerating machine working of R-22 operates between the evaporator temperature of -15 ^{0}C and condenser temperature of 40 ^{0}C. The vapour entering the compressor is just dry and saturated. Assume Isentropic Compression. Find **07**

1. C.O.P.
2. Refrigerating capacity of machine if mass flow rate of R-22 is 0.2 kg/s
3. Power required to Drive the Compressor if η_{mech} is 85%

OR

Q.3 (a) Explain the effect of increasing evaporator pressure on C.O.P. of vapour compression refrigeration system with the help of P-h diagram. **07**

(b) In a Bell-Coleman cycle working between pressure of 1 bar and 6 bar and temperature at beginning of compression and expansion of 8 ^{0}C and 35 ^{0}C respectively. If the compression and expansion indice in polytropic processe is 1.3, compute net work required. Take R=0.287 KJ/Kg.K and Cp = 1.005 KJ/Kg.K **07**

Q.4

(a) List types of Refrigerant. Describe desirable properties of Refrigerants. **07**

(b) Mention the procedure for selection of Fan and differentiate between centrifugal fan and axial fan. **07**

OR

Q. 4 (a) Name the different types of Duct Layout and explain anyone of them with sketch. **07**

(b) Explain the construction and use of Sling psychrometer **07**

Q.5

(a) Name the different source of Heat to be considered for the calculation of cooling load for any building for summer air conditioning. **07**

(b) Explain the following terms (Any Seven) **07**

1. Overall Heat Transfer co-efficient
2. Occupant load and Equipment Load
3. Application of Comfort chart
4. Velometer
5. Flywheel effect
6. Types Duct losses
7. Pitot tube

OR

Q.5 (a) State different types of Air Contaminants and explain its effect **07**

(b) Expalin any Three **07**

1. Sensible Heating and Cooling
2. Latent Heating and Cooling
3. By-Pass Factor
4. Cooling and De-Humidifaction
5. Apparatus Dew Point

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