Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012

Subject code: 170201 Date: 26/12/2012

Subject Name: Automobile Air Conditioning System

Time: 10.30 am - 01.00 pm Total Marks: 70

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks use psychrometric chart.**

Q.1 **(a)** **Define the following terms:** **07**

1. Air conditioning.
2. Wet bulb temp.
3. Sensible heat factor.
4. Wet bulb depression.
5. Dew point temp.
6. Relative humidity.
7. Psychrometry.

(b) Explain simple vapour compression refrigeration system with a neat diagram. **07**

Q.2 **(a)** With a neat sketch, explain automobile air conditioning system. **07**

(b) What is refrigerant? Write desirable properties of good refrigerant. **07**

OR

(b) Explain various types of refrigerant. **07**

Q.3 **(a)** Explain the following psychrometric processes: **07**

1. Adiabatic mixing of two air stream.
2. Heating and humidification of air.

(b) Explain vapour absorption refrigeration system with a neat diagram. **07**

OR

Q.3 **(a)** Explain the following psychrometric processes: **07**

1. Cooling and Dehumidification of air.
2. Cooling and humidification of air.

(b) Classify air conditioning systems. Explain year-round air conditioning system with a neat diagram. **07**

Q.4 **(a)** Write a short note on a psychrometric chart. **06**

(b) Write note on "cooling load of car". **08**

OR

Q.4 **(a)** What is By-pass Factor? Write the equation of By-pass Factor. **06**

(b) Air at dry bulb temperature of 30^0C and 60% RH enters a cooling coil at the rate of 250 m^3/min. (a) determine the refrigeration in ton needed to bring the temperature of air to the coil temperature of 23^0C and also the relative humidity at that condition. (b) If the ADP is 12^0C and the by-pass factor is 0.1, determine the refrigeration in ton needed and mass of water condensed out at the cooling coil per minute. Use Psychrometric chart. **08**

Q.5 **(a)** Explain air distribution and extraction systems. **07**

(b) Write any five troubles shooting and its diagnosis of air conditioning systems. **07**

OR

Q.5 **(a)** Write a short note on refrigerant gas charging procedure. **07**

(b) Write short note on servicing of compressor and heater in automobile air conditioning system. **07**

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