

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-VII Examination-Nov/Dec.-2011

Subject code: 170201**Date: 19/11/2011****Subject Name: Automobile Air conditioning system****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. Use Psychrometric chart.

- Q.1** (a) Define the term Air conditioning. Describe Automobile air conditioning system with a schematic diagram. **07**
- (b) Write Classification and desirable properties of refrigerants. Name the refrigerants generally used in automobile air conditioning. **07**

- Q.2** (a) Define the following terms : **07**
- (i) Wet bulb temperature (ii) Dew point temperature
(iii) Relative humidity (iv) Sensible heat factor
- (b) Classify Air conditioning systems. Describe any one of them. **07**

OR

- (b) Write the basic difference between Vapour compression refrigerator and Vapour absorption refrigerator. Explain Vapour compression refrigerating system with a diagram. **07**

- Q.3** (a) A small office hall of 25 persons capacity is provided with summer air conditioning system with the following data : **07**
- Outside conditions = 34°C DBT and 28°C WBT
Inside conditions = 24°C DBT and 50 % RH
Volume of air supplied = $0.4\text{ m}^3/\text{min./person}$
Sensible heat load in room = 125600 kJ/h
Latent heat load in room = 42000 kJ/h
Find the sensible heat factor of the plant.
- (b) Discuss Refrigerant gas charging procedure and Servicing of heater system. **07**

OR

- Q.3** (a) Write note on "Control Systems for Car air conditioner." **07**
- (b) Discuss in brief Testing, Diagnosis and Trouble shooting of air conditioning system. **07**

- Q.4** (a) With the help of Psychrometric chart, explain the following processes : **08**
- (a) Heating and Humidification
(b) Sensible cooling
(c) Dehumidification of moist air by cooling
(d) Adiabatic air mixing of two air streams
- (b) What is Refrigeration? Explain its applications. **06**

OR

- Q.4 (a)** The amount of air supplied to an air conditioned hall is 300 m³/min. The atmospheric conditions are 35⁰ C DBT and 55% RH. The required conditions are 20⁰ C DBT and 60% RH. Find out the sensible heat and latent heat removed from air per minute. **07**
- (b)** Explain in brief Air distribution system. Also state its impact on load calculations. **07**
- Q.5 (a)** Describe step wise procedure to calculate Load for automobiles. **07**
- (b)** Explain the following parts of automobile air conditioning system briefly : **07**
- (i) Pressure switch
 - (ii) Air conditioner relay
 - (iii) Magnetic valve
- OR**
- Q.5 (a)** What do you understand by term Cooling load? What are the different factors considered in load estimation sheet for comfort application? **07**
- (b)** Explain the following: **04**
- (i) Filters (ii) Duct
- (c)** Explain Phychrometer briefly **03**
