

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. IST Semester–Remedial Examination – July- 2011****Subject code: 711107****Subject Name: Automobile Refrigeration & A/C****Date: 12/07/2011****Time: 10:30 am – 01:00 pm****Total Marks: 60****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of properties table is permitted.

- Q.1** (a) Differentiate between vapour compression and vapour absorption refrigeration system. **06**
- (b) Give the important properties of following refrigerants with their chemical name and formulas. **06**
- (i) R-22 (ii) R-152a
- Q.2** (a) Define the following Psychrometric terms. **06**
- Wet bulb temperature
Dew point temperature
Relative humidity
Degree of saturation
Wet bulb depression
- (b) In a standard vapour compression refrigeration cycle operating between an evaporator temperature of -10°C and a condenser temperature of 40°C . The enthalpy of the refrigerant R-134a at the end of compression is 225 kJ/kg. Show the cycle on T-s diagram and calculate (i) C.O.P. (ii) Refrigerating capacity and (iii) Compressor work if the refrigerant mass flow rate is 1 kg/min. **06**
- OR**
- (b) Define Thermodynamic Comfort. Also describe various factors affecting comfort. **06**
- Q.3** (a) Explain summer air conditioning psychrometric process of dehumidification with cooling with neat sketch. **06**
- (b) 120 m^3 of air per minute at 35°C DBT and 50% RH is cooled to 20°C by passing through a cooling coil. Determine the following: **06**
- RH of outlet air and its WBT
Capacity of cooling coil in TR
Amount of water vapour removed per hour.
- OR**
- Q.3** (a) Describe various cooling loads to be considered for sizing the air conditioning system for passenger car. **06**
- (b) In a cooling application moist air enters a refrigeration coil at the rate of 100 kg/min at 35°C and 50 % RH. The apparatus dew point of coil is 5°C and by-pass factor is 0.15. Determine: (i) Outlet state of the air (ii) Cooling capacity of the coil in TR. **06**

