Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2015

Subject code: 170201 **Date:** 01/**05/2015**

Subject Name: Automobile Air-conditioning System

Time:02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of refrigeration and air-conditioning chart and table is permitted.**

Q.1	**(a)**	Differentiate between vapour compression and vapour absorption refrigeration system. Discuss suitability of refrigeration system for automobile air-conditioning.	**07**
	(b)	40 m^3 of air per minute at 31 °C DBT and 18.5°C WBT is passed over the cooling coil whose surface temperature is 4.4°C. The cooling capacity is 3.56 tons of refrigeration under the given condition of air. Determine DBT and WBT of air leaving the cooling coil.	**07**
Q.2	**(a)**	Explain concept of effective temperature and list ventilation requirements for automobile air-conditioning.	**07**
	(b)	List desirable characteristics of refrigerants. Explain how are refrigerants designated?	**07**
		OR	
	(b)	How are refrigeration compressors classified? Explain construction and working of any one.	**07**
Q.3	**(a)**	Draw neat and labeled sketches of following: i. Electrical wiring diagram of heating and cooling system ii. Evaporator or condenser of an automobile	**07**
	(b)	List various loads to be considered for deciding capacity of air conditioning system in a car.	**07**
		OR	
Q.3	**(a)**	Explain effect of air conditioning load on engine performance in terms of loss of available power and fuel consumption.	**07**
	(b)	Compare the following: i. Central air conditioning and unitary air-conditioning system. ii. Water cooled condenser and Air cooled condenser.	**07**
Q.4	**(a)**	Draw different duct arrangements of an air-conditioning system and explain any one in detail.	**07**
	(b)	Write brief note on: Automobile automatic temperature control.	**07**
		OR	
Q.4	**(a)**	How are ducts classified? List common duct materials and suitable shapes of ducts.	**07**
	(b)	List objectives of dashboard re-circulating unit and with sketch explain air flow mechanism.	**07**
Q.5	**(a)**	Write brief note on: Humidistat.	**07**

	(b)	Explain servicing mechanism of any component of automobile air-conditioning system.	**07**

OR

Q.5	**(a)**	State and explain function of different types of control dampers.	**07**
	(b)	Write brief note on: Refrigeration charging procedure.	**07**

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