Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code:181901 **Date:09/12/2015**

Subject Name: Refrigeration and Air conditioning

Time: 2:30pm to 5:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Mention the limitations of Simple vapour compression refrigeration Cycle. Briefly explain the working of Two stage compression with water intercooler and liquid sub-cooler employed for vapour compression system	**07**
	(b)	One kg of air at a pressure of 1.05 bar and a temperature of 20 C. is compressed to 6 bar. It is then cooled to 27 C in the cooler before entering the expansion cylinder .assuming compression and expansion as isentropic process ,determine (1) Refrigerating effect per kg of air(2)Theoretical C.O.P.	**07**
Q.2	**(a)**	Explain in brief important Properties required for a good refrigerant.	**07**
	(b)	State the Name of different types of system used for cooling of aircraft cabin, Also Explain with schematic diagram Bootstrap air Refrigeration system.	**07**
		OR	
	(b)	State the name of Different types evaporative devices used in refrigeration system Explain Thermostatic expansion valve.	**07**
Q.3	**(a)**	Explain with neat sketch working of Electrolux Refrigerator also explain significance of Hydrogen used in system	**07**
	(b)	State the principle of Steam jet refrigeration system. Explain the working of Steam jet refrigeration system	**07**
		OR	
Q.3	**(a)**	State and explain various heat loads to be considered for cooling load calculations of a typical building.	**07**
	(b)	With neat sketch explain working of Cold storage.	**07**
Q.4	**(a)**	Explain adiabatic saturation process with neat sketch and derive its expression	**07**
	(b)	A mixture of dry air and water vapour is at a temperature of 22 C under a total pressure of 730 mm of Hg .The dew point temperature is 15 C.Find (1)Partial pressure of water vapour(2)Relative humidity(3)Specific humidity (4)Enthalpy of air per kg of dry air (5)Specific volume of air per kg of dry air	**07**
		OR	
Q.4	**(a)**	Define following term related to psychrometry (i) wet bulb temperature (ii) dry bulb temperature (iii) Relative humidity (iv) specific humidity (v) dew point temperature (vi) apparatus dew point temperature (vii) sensible heat factor	**07**
	(b)	Explain equal friction method of duct sizing for air conditioning Under what situation is this method recommended .What are its disadvantages?	**07**
Q.5	**(a)**	Classify air conditioning systems. Explain Central air conditioning system with a neat sketch.	**07**

(b) Explain in brief the following **:** **07**

(1) Filters

(2) Humidifiers used in air conditioning systems

OR

Q.5 **(a)** What is effective temperature? What factors affect effective temperature and explain its significance in design of air-conditioning systems. **07**

(b) Classify Fan used in air-conditioning system. Explain selection of the Fan using fan characteristic curve. **07**

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