Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 1722103 **Date:14/05/2015**

Subject Name: **Advanced Air Conditioning**

Time: 02:30 pm to 5:00 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 if required.**

Q.1	**(a)**	Explain the terms RSHF, GSHF, ESHF and bypass factor.	**07**
	(b)	Describe clean room concept and application of clean room concept.	**07**
Q.2	**(a)**	Explain flywheel effect for cooling load calculation.	**07**
	(b)	Discuss factors affecting performance of cooling tower.	**07**
		OR	
	(b)	Explain velocity reduction method for determination of duct size.	**07**
Q.3	**(a)**	Describe the procedure for selection of an outlet using nomograph.	**07**
	(b)	Classify Air conditioning system and discuss factors affecting selection of Air conditioning system	**07**
		OR	
Q.3	**(a)**	Discuss and compare performance characteristic of FC, BC and RC fans.	**07**
	(b)	Describe different methods of noise reduction in Air Conditioning system	**07**
Q.4	**(a)**	Following data is available for the air conditioned room. Outside design condition 35 ęC DBT and 25 ęC WBT. Inside design condition 21 ęC DBT and RH = 70%. RSH = 46.5 kW and RLH = 2.9 kW. Ventilation air = 108 m^3/min. Assuming BF = 0.05. Calculate (1) Outside air loads (2) ESHF (3) Grand total heat (4) RSHF (5) Dehumidified air quantity (6) GSHF (7) Coil apparatus dew point	**07**
	(b)	Discuss Air Quality and its importance on human comfort and health	**07**
		OR	
Q.4	**(a)**	A cooling tower is to be designed to cool 140000 kg/hr of water received at 49 ęC. The air entering the bottom of the tower is 100000 kg/hr at 30 ęC DBT and 16 ęC WBT. The air leaves the top of the tower at 43 ęC DBT and 95% RH. Find (1) The temperature to which the water is cooled (2) Loss of water /hour.	**07**
	(b)	Discuss factors affecting duct construction	**07**
Q.5	**(a)**	Explain acoustic rating system and RC, NC and NR criteria for noise rating.	**07**
	(b)	A rectangular has dimensions of 300mm x 750 mm. It has to handle 60 m^3/s of standard air. Calculate (1) friction loss in a duct of 50 m equivalent length (2) friction loss of similar duct made from concrete duct. Take D_e=506 mm and correction factor for concrete as 1.78.	**07**
		OR	
Q.5	**(a)**	Explain dual duct system for air conditioning. Also carry out psychrometric representation of the same system.	**07**
	(b)	A centrifugal fan has a circular inlet duct 450 mm diameter and a rectangular duct of 450 mm x 375 mm. The SP at the fan inlet is 125 Pa and a SP at the fan outlet is 250 Pa when it delivers 110m^3/ min and absorbs 1 kW power. Assume standard air, calculate (1) total pressure at fan inlet and outlet. (2) Fan total pressure and fan static pressure (3) fan total and fan static efficiency.	**07**