Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(Old course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 1722103 **Date: 11/12/2015**

Subject Name: Advanced Air Conditioning

Time:2:30 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 of Pychrometric chart and table is permitted**

Q.1	**(a)**	Discuss factors affecting the air conditioning system selection.	**07**
	(b)	State and explain the types of evaporative cooling system with sketch.	**07**
Q.2	**(a)**	The following two indoor conditions give the same comfort when the outdoor conditions are 35 °C DBT and 60% Relative Humidity (RH) (a) 22 °C DBT and 55% RH (b) 20 °C DBT and 65% RH If the circulation of free air through the air conditioning system is 200m^3/min then find the working cost of the plant per day in both cases. If the rate of cooling is 50 paisa per ton of refrigeration per hour and rate of heating is 10 paisa per kWh. Dew point temperature of the cooling coil is 10 °C. Also find the bypass factor of the coil in both the cases. The required conditions are achieved first by cooling and dehumidifying and then by heating.	**07**
	(b)	Explain constant volume-variable temperature Air Conditioning system with neat sketch.	**07**
		OR	
	(b)	Compare Forced draft and Induced draft cooling towers.	**07**
Q.3	**(a)**	Explain terms RSHF,GSHF, ESHF and By pass factor	**07**
	(b)	Describe different sources of heat load for air conditioning system with formula of load calculation.	**07**
		OR	
Q.3	**(a)**	Using skeleton psychrometric chart, explain cooling and dehumidification process with ventilation air and cooling coil with bypass factor. On the same chart clearly show Room ADP and Coil ADP	**07**
	(b)	Describe advances in Air Conditioning System	**07**
Q.4	**(a)**	Describe Clean Room Concept. Enlist applications of Clean Room Concept.	**07**
	(b)	Enlist and explain factors considered in Air Distribution System.	**07**
		OR	
Q.4	**(a)**	Define Effective Temperature. Discuss factors governing Optimum Effective Temperature.	**07**
	(b)	Enlist and describe methods for duct design.	**07**
Q.5	**(a)**	Describe the sources of Noise in Air Conditioning system in detail	**07**
	(b)	A circular duct of 40 cm diameter is selected to carry air in an air conditioning space at a velocity of 440 m/min. If this duct is to be replaced by a rectangular duct of aspect ratio of 1.5, find out the size of rectangular duct for equal friction method when (A) the velocity of air in two ducts is same, (B) the discharge rate of air in two ducts is same.	**07**
		OR	

Q.5 **(a)** Enlist and Explain various methods of Noise Control in Air Conditioning system **07**

(b) A library hall is to be maintained at 24 ℃ DBT and 50 % RH when ambient conditions are 38 °C DBT and 40% RH. The room sensible and latent heat gains are 125000 kJ/hr and 68000 kJ/hr respectively. The ventilation is $65m^3$/min. find the following (1) Grand Total Heat (2) Effective Sensible Heat factor (3) ADP temperature (4) Dehumidified air quantity. Take bypass factor for coil = 0.1 **07**

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