Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 1721107 **Date:15/05/2015**

Subject Name: Energy Conservation & Management

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.**

Q.1	**(a)**	What are the major pollutants in burning fossil fuels? Describe them.	**07**
	(b)	Why energy conservation is important in the prevailing energy scenario? Explain.	**07**
Q.2	**(a)**	Why energy audit needed. Explain ten step methodology for energy audit.	**07**
	(b)	Write a short note on Energy resources and availability in INDIA.	**07**
		OR	
	(b)	A three phase, 10 kW motor has the name plate details as 415 V, 18.2 amps and 0.9 PF. Actual input measurement shows 415 V, 12 amps and 0.7 PF which was measured with power analyser during motor running. Find out efficiency of motor at full load and motor loading in percentage. Use P = 1.732×V×I× PF (PF ï Power Factor)	**07**
Q.3	**(a)**	Explain ï (1) Grades of Energy, (2) Directional and Alternate Current, (3) Conventional and non-conventional Energy Sources.	**07**
	(b)	Describe need of computer controlled energy management.	**07**
		OR	
Q.3	**(a)**	Discuss waste heat recovery in heat pipe with advantages and industrial applications.	**07**
	(b)	Define waste heat boiler. Explain with suitable diagram.	**07**
Q.4	**(a)**	What do you mean by cogeneration? How cogeneration is beneficial over a conventional power plant?	**07**
	(b)	(i) The nameplate details of a motor are given as power = 15 kW, efficiency = 0.9. Using a power meter the actual three phase power drawn is found to be 8 kW. Find out the loading of the motor in percentage. (ii) What is the need for performance assessment of a heat exchanger?	**07**
		OR	
Q.4	**(a)**	Write a note on economic thickness of Insulations (ETI).	**07**
	(b)	An office building has a roof which has a heat transfer coefficient (U) of 1.1 W/m^2K. It is proposed that additional insulation be installed in the roof to bring its *U* value down to 0.25 W/m^2K. The office building is located in a region which experiences an annual total of 2350 degree days. Assuming that the efficiency of the building heating system is 70%, the cost of fuel is Rs. 150 /kWh and the capital cost of installing the roof insulation is Rs. 200.00 per m, determine the payback on the investment.	**07**
Q.5	**(a)**	Can anyone store energy? Please explain any two methods in details.	**07**

	(b)	Why electric load management is needed? Describe step by step approach for maximum electrical demand control.	**07**

OR

Q.5	**(a)**	Briefly explain various energy conservation opportunity in a refrigeration plant.	**07**
	(b)	Explain energy conservation opportunities in any residential building.	**07**

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