Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME SEMESTER–II • EXAMINATION – SUMMER 2015

Subject Code: 2723915 **Date:01/06/ 2015**

Subject Name: Energy Audit and Management

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.**

Q.1	**(a)**	What is an energy audit? Explain briefly the difference between preliminary and detailed energy audits?	**07**
	(b)	List down the objectives of energy management.	**07**
Q.2	**(a)**	Write a short note on automatic power factor controller.	**07**
	(b)	Define following in context of Lightning: (1) Lumen (2) Lux (3) Color Rendering Index (CRI)	**07**
		OR	
	(b)	Define Harmonics in power system. Explain different sources of harmonics and methods to Eliminate Harmonics.	**07**
Q.3	**(a)**	What do you mean by demand side management? Describe briefly.	**07**
	(b)	Discuss performance evaluation of boilers.	**07**
		OR	
Q.3	**(a)**	Write a short note on factors to be considered for selection of appropriate variable speed drive and its successful implementation.	**07**
	(b)	List at least four energy conservation measures in improving the boiler efficiency without investment.	**07**
Q.4	**(a)**	Write short note on FBC boiler.	**07**
	(b)	Why do furnaces operate at low efficiency? What are the methods by which furnace efficiencies can be improved?	**07**
		OR	
Q.4	**(a)**	Discuss waste heat recovering options.	**07**
	(b)	Explain economic thickness of insulation.	**07**
Q.5	**(a)**	Discuss Energy Saving in Compressors & Compressed Air Systems.	**07**
	(b)	The following table gives the centrifugal water pump details: Rated flow : 90 m^3/h Rated head : 4.5 $kg/cm^2(g)$ Motor Rating of pump : 37 kW Considering 65% pump efficiency and 85% motor efficiency, (i) find out whether the sizing of the drive correct? If not what should be the size of motor? (ii) If the above pump is drawing 18.5 kW and required head is 30m, the rated flow rate is 90 m^3/h, what should be the size of the new pump? What would be the savings considering 70% pump efficiency and 89% motor efficiency?	**07**
		OR	
Q.5	**(a)**	What do you understand by the term waste heat? What are the direct and indirect benefits of waste heat recovery?	**07**
	(b)	Write a short note on Energy Saving in Pumps & Pumping Systems.	**07**