Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 171907 **Date:04/12/2015**

Subject Name: Energy Conservation & Management

Time: 10:30am to 1:00pm **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)**	Classified various energy and explain in brief.	**07**
	(b)	Discuss India's present energy scenario and long term energy scenario.	**07**
Q.2	**(a)**	Define: Power factor, Load factor, Specific heat, Latent heat of fusion, Humidity, Gross calorific value, Relative density	**07**
	(b)	Explain various basic electrical parameters to calculate electricity tariff for an industry.	**07**
		OR	
	(b)	(i) An electric heater of 250 V, 3.5 kW rating is used for hot water generation. Find electricity consumption (a) at the rated voltage per hour & (b) at 230 V for 5 hour.	**03**
		(ii) A three phase, 5 kW motor has the technical specifications like 350 V, 20 amps and 0.7 PF. Actual input measurement by an energy auditor is found as 350 V, 18 amps and 0.5 PF which was measured with power analyzer device. Find the motor loading in percentage.	**04**
Q.3	**(a)**	List and explain factors which influence the thermal performance of the building from energy management point of view.	**07**
	(b)	Define energy management. Which are the types of energy audit? Explain detailed energy audit.	**07**
		OR	
Q.3	**(a)**	Define energy conservation. Give the name and application of the energy audit instruments in brief.	**07**
	(b)	Define the terms: SPP, ROI, NPV, IRR, Cash flow, Risk analysis & Time value of money.	**07**
Q.4	**(a)**	What is the role of an ESCO? Discuss it in detail.	**07**
	(b)	Investment for an energy conservation project is Rs.11,00,000. Annual savings for the first three years is 1,75,000; 2,00,000 & 3,25,000. Considering cost of capital as 12%, what is the net present value (NPV) of the project? You're your comments on the result and also mention the advantages of NPV method.	**07**
		OR	
Q.4	**(a)**	What are the benefits of monitoring & targeting system? Differentiate between (1) Energy monitoring & targeting (2) Internal & external benchmarking.	**07**
	(b)	Explain the importance of CUSUM chart and its procedure to analyze the case with help of diagrams.	**07**
Q.5	**(a)**	Explain energy efficiency in steam boiler.	**07**
	(b)	Give various tips for energy savings in thermal utility devices like compressor, pump and refrigeration system.	**07**
		OR	

Q.5	**(a)**	Which are the cogeneration plants? Explain bottoming cycle with diagram.	**07**
	(b)	Explain various sources of heat recovery.	**07**

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