Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2181916 **Date: 04/05/2017**

Subject Name: Energy Conservation and Management(Department Elective II)

Time: 10:30 AM to 01:00 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)**	Investment for an energy proposal is Rs.10.00 lakhs. Annual savings for the first three years is 180,000, 200,000 & 310,000. Considering cost of capital as 11 %, what is the net present value of the proposal?	**07**
	(b)	Find out the efficiency of the oil fired boiler by indirect method and Boiler Evaporation ratio. Ultimate analysis of Oil (C = 84.0 %, H_2 = 12.0 %, S = 3.0 %, O_2 = 1.0 %), GCV of Oil = 10250 kCal/kg, Enthalpy of steam = 660 kCal/kg, Feed water enthalpy = 60 kCal/kg, % of Oxygen in flue gas= 7, % of CO_2 in flue gas = 11, Flue gas temperature (T_f) = 220 ^oC, Ambient temperature (T_a) = 27 ^oC, Humidity of air = 0.018 kg/kg of dry air, Take C_p = 0.23 kCal/kg.^oC for flue gas & C_p= 0.45 kCal/kg.^oC for steam.	**07**
Q.2	**(a)**	Define and briefly explain: Energy conservation and Energy management.	**07**
	(b)	Write note on 'Indian Energy scenario'.	**07**
		OR	
	(b)	Explain commercial and non-commercial energy, primary and secondary Energy resources.	**07**
Q.3	**(a)**	Explain scheme of BEE including designated consumers.	**07**
	(b)	Explain Internal rate of return technique with example.	**07**
		OR	
Q.3	**(a)**	Define following terms: (i) CUSUM, (ii) EMIS, (iii) Energy monitoring. and Explain the role of Energy Service COmpanies (ESCOs.)	**07**
	(b)	Explain Simple pay back method with its advantage & limitation.	**07**
Q.4	**(a)**	Explain need for energy audit and information to be collected during the detailed energy audit.	**07**
	(b)	What are the disadvantages of 'direct method' of boiler efficiency evaluation over 'indirect method'? Write step wise procedure to calculate Boiler efficiency.	**07**
		OR	
Q.4	**(a)**	Classify the energy audit & Explain the three phases of detailed energy audit.	**07**
	(b)	How to save energy in Refrigeration and Air Conditioning plant?	**07**
Q.5	**(a)**	Explain commercially viable waste heat recovery devices and their saving potentials.	**07**
	(b)	Explain Clean Development Mechanism (CDM).	**07**
		OR	
Q.5	**(a)**	Explain performance evaluation of a furnace.	**07**
	(b)	Explain Prototype Carbon Fund (PCF).	**07**

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