

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 %, H₂ = 12.0 %, S = 3.0 %, O₂ = 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 CO₂ in flue gas = 11, Flue gas temperature (T_f) = 220 °C, Ambient temperature (T_a) = 27 °C, Humidity of air = 0.018 kg/kg of dry air, Take C_p = 0.23 kCal/kg.°C for flue gas & C_p = 0.45 kCal/kg.°C 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**
