Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent Institution of MAHE, Manipal)

VII SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKEUP EXAMINATIONS, DECEMBER 2017

SUBJECT: ENERGY AUDITING [ELE 4006]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 28 December 2017** **Max. Marks: 50**

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. ___ is commercial energy
___ is a financial turnaround and revival package by Ministry of Power, Govt of India
___ in Rajasthan has a strategic oil reserve
___ is an act of parliament of India, enacted to transform power sector
National Action Plan on climate change has ___ missions ***(05)***

1B. A spherical balloon with a diameter of 5 mts is filled with natural gas. How much energy is contained in the quantity of natural gas ***(05)***

2A. Write a note on Technical & Economic feasibility of energy conservation opportunities ***(05)***

2B. Describe Energy Benchmarking and list out the steps in energy conservation benchmarking ***(05)***

3A. List out some of the Instruments and Metering that could be used for data collection ***(04)***

3B. Define (i) Capital Cost (ii) depreciation (iii) Salvage value ***(06)***

4A. A solution containing 5 % solids is mixed with 20 % solid solution and a single output of 25 % is removed. If the 5 % solution enters at 10 Kg / sec, what are the other rates assuming that there is no accumulation ***(05)***

4B. Based on IRR, decide which project is to be preferred if the discount rate is 10 % ***(05)***

	Investment	1	2	3
Project A	5,000	2,500	5,000	2,500
Project B	8,000	5,000	2,500	5,000

5A. A motor replacement has the following strategy of purchase
(a) Normal efficiency motor (Capital Cost = Rs 10,000, Annual Operating Cost = Rs 25,000)
(b) Higher efficiency motor (Capital Cost = Rs 20,000, Annual Operating Cost = Rs 10,000)
For a 15 year motor life, 30 year investment horizon, inflation rate of 5 %, discount rate of 10 %, determine which purchase is beneficial ***(05)***

5B. For the following motor-pump system, determine the present value of the energy loss: Fluid density = 1000 Kg / m^3, Flow rate = 0.048 m^3 / sec, Total Head = 60 mts, Motor input = 50 kW, Motor Efficiency = 85 %, Operating hours = 6500 hrs, System life = 10 years, Discount Rate = 10 %, Energy cost = Rs. 5 / kWh, ***(05)***