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T.E. (Electrical Engineering) (Semester – II) Examination, 2011
ENERGY AUDIT AND MANAGEMENT (New)
(2008 Pattern)

Time : 3 Hours

Max. Marks : 100

- Instructions :*
- 1) Answers to the **two** Sections should be written in **separate** books.
 - 2) **Neat** diagrams must be drawn **wherever** necessary.
 - 3) **Black** figures to the **right** indicate **full** marks.
 - 4) **Use** of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is **allowed**.
 - 5) **Assume** suitable data, if **necessary**.

SECTION – I

1. a) Discuss some of the long term energy strategies available for the energy security. 8
- b) What is green house effect ? What are the key green house gases ? Discuss adverse effects of harmful emissions. 8

OR

2. a) Give salient features of Energy Conservation Bill 2001. 8
- b) Briefly describe the energy reforms taking place in India. 8
3. a) Define demand side management with suitable examples enlight tools for demand restrain. 8
- b) State role of energy manager and list duties of energy manager. 8

OR



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4. a) How demand side management is used to control agricultural and domestic load ? 8
- b) Give the structure of energy management cell in a industry. Also explain commitment of top management towards energy conservation. 8
5. a) Why energy audit is to be carried out ? Explain phases of energy audit. 9
- b) With reference to energy audit explain following :
- i) energy policy
- ii) action plans
- iii) energy or power flow diagram. 9

OR

6. a) Explain with examples, fuel and energy substitution. 5
- b) Give the format of energy audit report. 5
- c) Use CUSUM technique and calculate energy savings. The average production can be 4000 MT/month. The specific energy consumption data is given below :

Month	Actual-SEC kWh/MT	Predicted - SEC kWh/MT
Jan.	242	265
Feb.	238	265
Mar.	287	265
Apr.	237	265
May	295	265
June	246	265

Draw necessary Cusum graph.

8



SECTION – II

7. a) The exterior areas of a compressor section are illuminated by twenty wall mounted 1000 W tungsten halogen single fitting lamp, luminaries. The lamp is 'ON' 12 hours a day, throughout the year.

With reference to data given below suggest the suitable retrofit for annual energy saving and simple pay back period. Take electricity cost Rs. 4.00/kWh.

Luminaire	Lumens	Efficacy	Cost/lamp
1000 W Halogen lamp	22,100	22.7	Rs. 5,000
250 W HPSV lamp	24,600	98.4	Rs. 5,500
400 W metal halide lamp	27,000	67.5	Rs. 6,500

10

- b) Explain benefits of TOD tariff and power factor tariff with reference to energy management.

8

OR

8. a) A proposed energy conservation project requires capital investment of Rs. 20,000. The cash flow generated by the project for next six years are Rs. 8,000, Rs. 8,000, Rs. 8,000, Rs. 6,000, Rs. 6,000 and Rs. 6,000 respectively. Calculate net present value and state economic viability of the project.

8

- b) i) What criteria need to be considered while listing down the investment opportunities for any energy conservation projects ?

ii) Write a note on AB tariff.

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9. a) What is cogeneration ? Explain different configurations possible with steam turbine cogeneration system.

8

- b) Enlist energy conservation opportunities in pumping systems.

8

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10. a) i) Explain effect of unbalance in supply on motor performance.
ii) How to access installed load efficacy ratio for an illumination scheme ? 8
- b) Enlist measures to be adopted for following components of HVAC system by which energy consumption can be reduced.
i) Compressor ii) Cooling tower. 8
- 11.a) Explain technical means for T & D loss minimization. 8
- b) Elaborate possible avenues for energy conservation in steel industry. 8
- OR
12. a) What are the probable areas in which energy can be saved for municipal corporation ? State financially attractive measures by which energy can be saved. 8
- b) During energy audit of IT industry, audit team have identified short term and long term energy conservation measures. What may be the recommendations of the team in respect of higher total harmonic distortion, lower power factor and use of DG set ? 8

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