

Total No. of Questions : 12]

SEAT No. :

**P1492**

**[5460]-169**

[Total No. of Pages : 2

**T.E. (Electrical)**

**ENERGY AUDIT & MANAGEMENT**

**(2012 Course) (Semester - II)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Your answers will be valued as a whole.*
- 4) *Use of logarithmic tables slide rule, Mollier chart, electronic pocket calculator and steam tables is allowed.*
- 5) *Assume suitable data, if necessary.*

**Q1)** Discuss long term and short term measures for securing future energy requirements of our country. [6]

OR

**Q2)** Give salient features of Electricity act 2003. [6]

**Q3)** Give the organisational structure of a large scale manufacturing unit in respect to energy management. Also explain constitution of Energy Committee. [7]

OR

**Q4)** Explain in detailed energy management strategy. [7]

**Q5)** Explain with neat block diagram process of automatic meter reading systems. [7]

OR

**Q6)** What are the benefits of wave shaping the load curve? Explain with suitable examples of wave shaping of residential consumers. [7]

**Q7) a)** Discuss steps involved in detailed energy audit. [8]

b) How least square method is used in energy audit for data analysis? [8]

OR

**Q8) a)** Why planning is important in energy audit? What is action plan? Explain it with suitable example. [8]

b) Discuss energy audit case study of paper and pulp industry. Highlight the recommendations for energy saving. [8]

*P.T.O.*

- Q9)** a) Compare Premium Efficiency Motor with Standard motor respective, size, cost, performance parameters, material used and quality of material. [6]  
 b) Explain energy efficiency measures in pumping systems. [6]  
 c) Discuss methods of reducing technical and commercial losses in distribution system. [6]

OR

- Q10)**a) With suitable examples explain different types of cogeneration schemes. It is recommended in the energy audit that waste heat recovery scheme must be implemented. Suggest appropriate system and justify your answer. [9]  
 b) Explain selection criteria for diesel generator. Explain effect of calorific value of fuel, turbo charger, transient loads on performance of D.G. [9]

- Q11)**a) Calculate Net Present Value of the proposal of energy saving in cement industry. The cost of retrofit is around Rs 12,00,000. The annual savings realised for consecutive five years are Rs.3,00,000, Rs.3,00,000, Rs.3,50,000, Rs.3,50,000 and Rs.4,00,000. The discounting factor is 12%. Comment on the economic viability of the project. [8]  
 b) Discuss energy conservation opportunities in commercial establishment identified during energy audit. [8]

OR

- Q12)**a) What is the time value of money? Also explain criteria for financial appraisal of economic investment. [8]  
 b) The cost and estimated savings data for an energy saving retrofit project is given in table below.

| Retrofit cost | Energy & demand savings                          | Maintenance cost savings                          |
|---------------|--|---|
| Rs.1,00,000   | 7,000 kWh/year & Rs.3,800/year as demand charges | Annual maintenance cost savings will be Rs.2000/- |

The key data is given below:

Energy savings are based on Rs. 3.00/kWh. There will be no changes in energy rates for 10 years. The useful life of the project is 8 years. With discounting factor of 12% calculate NPV. [8]

