Total No. of Questions : 12] **SEAT No. :**

P2951 **[Total No. of Pages : 3**

[5669]-540

T.E. (Electrical)

ENERGY AUDIT AND MANAGEMENT

(2015 Pattern)

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) ***Use of logarithmic tables, slide rule, Mollier charts, electronics pocket calculator is and steam table is allowed.***
4) ***Assume suitable data, if necessary.***

Q1) What are the adverse effects of energy use on environment? **[6]**

OR

Q2) Explain the terms Energy Intensity and Energy Security. **[6]**

Q3) What is energy management? Discuss energy management strategies. **[7]**

OR

Q4) Explain vital elements of successful energy management? What is the role of engineering department in energy management? **[7]**

Q5) Discuss the avenues under supply side management. **[7]**

OR

Q6) Explain role of renewable energy in energy management. **[7]**

P.T.O.

Q7) a) What is energy audit? Explain steps in detailed energy audit. How it is different from preliminary energy audit? **[10]**

b) In a process industry data of energy consumption and production is given below. Use Cusum technique to estimate energy saving in plant. Also plot Cusum graph. The specific energy consumption of plant being 800 kCal/T. Fixed consumption of the plant is 3000kCal. **[8]**

Month	Production(MT)	Actual Energy Consumption (kWh)
1	1000	750000
2	900	720000
3	1100	800000
4	1400	900000
5	1200	800000
6	1300	850000

OR

Q8) a) Discuss use of various instruments for energy audit. **[9]**

b) What is bench-marking? Give common bench-marking examples. How bench-marking is useful in energy audit? **[9]**

Q9) a) Explain energy conservation measures in compressors and blowers. **[8]**

b) Discuss energy management options in T & D sectors. **[8]**

OR

Q10)a) Discuss energy saving options in pumps and piping systems. **[8]**

b) Explain energy conservation options in sugar industry. **[8]**

Q11)a) A paper mill has investment option for energy saving projects:

Option: A Investment envisaged Rs.40 lakhs . annual return is Rs.8 lakhs, life of the project is 10 years, discount rate 10%. Calculate economic feasibility by calculating net present value method. **[8]**

b) Explain Time value of Money. How it affects financial appraisal? How appraisal criteria will change in lending and borrowing condition. **[8]**

OR

Q12)a) 100 numbers of fused 60 Watt incandescent light bulbs (ILB) are replaced by same numbers of 12 Watt CFL instead of new ILB. Calculate the following for 4000 hours of operation per year. **[8]**

i) The annual "kWh saved"

ii) The annual "kVAh saved" if the power factor of the CFL is 0.6.

iii) The annual reduction in electricity costs if Rs. 4 per kWh is the energy charge and Rs. 250 per kVA per month is the demand charge.

iv) The simple payback period if the ILB costs Rs. 10 and the CFL costs Rs. 100 (assume life of ILB and CFL as 1000 hours and 4000 hours respectively).

b) Explain with suitable example sensitivity analysis. How it is different from others? **[8]**

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