Total No. of Questions : 8]

SEAT No. :

P756

[Total No. of Pages : 2

[5870]-1060
T.E. (Electrical)
ENERGY MANAGEMENT
(2019 Pattern) (Elective - II) (Semester - II) (303151D)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side 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.***

Q1) a) Discuss in detail the avenues under supply side management. **[9]**

b) Explain role of tariff in energy management. Discuss tariff structures used for energy management. **[9]**

OR

Q2) a) Explain with suitable examples role of renewable energy in energy management. **[9]**

b) With suitable flow graph explain implementation of demand side management for industrial consumers. **[9]**

Q3) a) What is energy audit? Explain steps in detailed energy audit. How it is different from preliminary energy audit? **[9]**

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 (kCal)
1	1000	750000
2	900	720000
3	1100	800000
4	1400	900000
5	1200	800000
6	1300	850000

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OR

Q4) a) Discuss use of various instruments for energy audit. **[9]**

b) Discuss clustering techniques used in data analytics. What information can be obtained from it? **[8]**

Q5) 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. **[9]**

b) Explain Time value of Money. How it affects financial appraisal? How appraisal criteria will change in lending and borrowing condition. **[9]**

OR

Q6) 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. **[9]**

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 energy conservation options in sugar industry. **[9]**

Q7) a) Explain energy conservation measures in compressors and blowers. **[8]**

b) Discuss energy management options in T & D sectors. **[9]**

OR

Q8) a) Discuss energy saving options in pumps and piping systems. **[8]**

b) Discuss different cogeneration systems. **[9]**

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