Total No. of Questions : 10]

SEAT No. :

P3623

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B.E. (Mechanical) (Semester - I)

ENERGY AUDIT AND MANAGEMENT

(2012 Pattern) (Elective - I)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagram must be drawn wherever necessary.***
2) ***Figures to the right indicates full marks.***
3) ***Use of Electronic pocket calculator is allowed.***
4) ***Assume suitable data, if necessary.***

Q1) a) Write a short note on: **[6]**

i) Commercial & non-commercial energy.

ii) Renewable & non-renewable energy

b) Explain preliminary energy audit & its importance. **[4]**

OR

Q2) a) Explain detailed energy audit with its 10 steps. **[6]**

b) Explain following instruments used in Energy Audit with their application: **[4]**

i) Combustion analyzer

ii) Infrared pyrometer

P.T.O.

Q3) a) What is the NPV of an energy conservation project with cash flow given below: **[6]**

Initial investment	Rs. (1,000,000)
Saving in Year	Cash Flow
1	Rs. 200,000
2	Rs. 200,000
3	Rs. 300,000
4	Rs.300,000
5	Rs. 350,000

The discount rate k = 10%. Is the proposal attractive?

b) Write a short note on Return on Investment. **[4]**

OR

Q4) a) An economizer costs Rs. 200000 and will last for 10 years. It will generate a saving of Rs. 35,000 per year with a maintenance cost of Rs.5000 per year. The discount rate is 10% and salvage value is Rs.5000 at the end of 10 years. Is the proposal attractive by NPV method? **[8]**

b) What is the simple payback period? **[2]**

Q5) a) Explain merits and demerits of Direct and Indirect methods used for calculating boiler efficiency. **[8]**

b) Write down varies energy conservation opportunities in HVAC System and DG set. **[8]**

OR

Q6) a) Explain various losses in industrial furnace system with a neat schematic sketch. Explain the indirect method of performance evaluation of a furnace. **[8]**

b) What is the importance of Analysis and Recommendation for Energy Audit? **[8]**

Q7) a) Explain electrical billing tariff structure for an industrial consumer. **[8]**

b) What is power factor? What are the benefits of improving power factor? **[8]**

OR

Q8) a) What is maximum demand in electrical systems? Explain how maximum demand is calculated with the help of a load curve. **[8]**

b) What are the types of lamps used in lighting system? Write down their features with typical applications. **[8]**

Q9) a) Describe various factors influencing selection of co-generation plant. **[8]**

b) Write short note on: **[6]**

i) CDM projects

ii) Carbon credits

c) How the Waste heat recovery systems are classified? **[4]**

OR

Q10)a) What is cogeneration? What are the advantages of cogeneration? **[8]**

b) What are the direct and indirect benefits of Waste Heat Recovery plant? **[6]**

c) Explain working of convective Recuperator with neat sketch. **[4]**