

Total No. of Questions : 10]

SEAT No. :

P2139

[Total No. of Pages : 3

[5254]-534

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 indicate 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) Primary & Secondary energy sources.
- ii) Primary energy consumption & Final energy consumption.

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

OR

Q2) a) Explain detailed energy audit. **[6]**

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

- i) Ultrasonic leak detector
- ii) Lux meter

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

Initial investment	Rs. (20,00,000)
Saving in Year	Cash Flow
1	Rs. 400,000
2	Rs. 400,000
3	Rs. 600,000
4	Rs. 600,000
5	Rs. 700,000

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

b) Write a short note on simple payback period with the advantages of this method. **[4]**

P.T.O.

OR

Q4) a) An air pre-heater costs Rs.4,00,000 and will last for 5 years. It will generate a saving of Rs. 1,40,000 per year with a maintenance cost of Rs.20,000 per year. The discount rate is 10% and salvage value is Rs. 10,000 at the end of 5 year. Is the proposal attractive by NPV method? **[6]**

b) What is return on investment? **[4]**

Q5) a) What are the different losses in a boiler system, which are considered in Indirect method for calculating boiler efficiency? Explain with neat sketch. Write formula for calculating boiler efficiency by Indirect method. **[8]**

b) What are the different opportunities for saving energy in central chilled water plant? **[8]**

OR

Q6) a) Explain direct and indirect method of performance evaluation of a furnace with their advantages & disadvantages. **[8]**

b) What are different Energy Conservation Opportunities in Cooling Tower and Pumping System? **[8]**

Q7) a) Explain step by step approach for maximum demand control. **[8]**

b) Write a short note on - Energy saving opportunities with electrical system.**[8]**

OR

Q8) a) What is power factor? What are the benefits of improving power factor?**[8]**

b) Write a detail note on recommended luminance levels for various tasks/activities/locations. **[8]**

Q9) a) Explain the concept of co-generation and its potential benefits with a neat sketch. **[8]**

- b) Write short note on : [6]
- i) Recuperator
 - ii) Regenerator
- c) How does a shell & tube heat exchange work? [4]

OR

- Q10)**a) Explain various topping cycle cogeneration systems. [8]
- b) What are the direct and indirect benefits of Waste Heat Recovery plant? [6]
- c) Explain working heat wheel with neat sketch. [4]

