

Total No. of Questions : 12]

SEAT No. :

**P3587**

[Total No. of Pages : 3

**[4959]-1058**

**B.E. (Mechanical Sandwich Engg.)**

**ENERGY AUDIT & MANAGEMENT**

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

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right 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 energy scenario in India. **[5]**

b) List down the responsibilities of Energy Auditor. **[5]**

OR

**Q2)** a) Write short notes on : **[6]**

i) Ozone layer depletion

ii) Green House Effect.

b) Write down the responsibilities and functions of BEE. **[4]**

**Q3)** a) What are different Energy Conservation Opportunities in HVAC System? **[5]**

b) Write down the steps to carry out detailed energy audit. **[5]**

OR

**Q4)** a) What are different Energy Conservation Opportunities in Heat Exchanger System? **[4]**

b) Explain different instruments and equipments used for energy audit. **[6]**

**P.T.O.**

- Q5)** a) A sum of Rs. 20,000 is deposited in a bank at the beginning of a year. The bank pays 6% interest annually. How much money is in the bank account at the end of the fifth year, if no money is withdrawn? [5]
- b) Calculate Net present Value of a project at a discount rate of 16% with an Investment of Rs. 50,000 at the beginning of the first year, & saving of Rs. 23,000 & Rs. 36,000 at the end of the first & second year respectively. [5]

OR

- Q6)** Evaluate the financial merit of a proposed project shown in table below. Consider annual discount rate of 8% for each project. Use Net present analysis technique. [10]

	Project-I	Project-II
Capital cost (Rs.)	30,000	30,000
Year	Net Annual saving (Rs.)	Net Annual saving (Rs.)
1	6000	6600
2	6000	6600
3	6000	6300
4	6000	6300
5	6000	6000
6	6000	6000
7	6000	5700
8	6000	5700
9	6000	5400
10	6000	5400

- Q7)** a) List the energy saving opportunities in pumping system. [7]
- b) Find out the efficiency of the boiler by direct method with the data given below : [7]
- i) Type of boiler : Coal fired
  - ii) Quantity of steam (dry) generated 8 TPH
  - iii) Steam pressure (gauge)/temp: 10 kg/cm<sup>2</sup>(g)/180°C
  - iv) Quantity of coal consumed: 1.8TPH
  - v) Feed water temperature: 85°C

- vi) Gross Calorific Value of coal: 3200 kJ/kg
- vii) Enthalpy of saturated steam at 100 kg/cm<sup>2</sup> pressure: 665 kJ/kg
- viii) Enthalpy of feed water : 85 kJ/kg

OR

- Q8)** a) Explain direct and indirect method to find out boiler efficiency. [8]
- b) Explain the following parameters in the brief: [6]
- i) Excess air ratio
  - ii) Stoichiometric air quantity
  - iii) Balanced draught

- Q9)** a) Explain the terms : [6]
- i) Maximum demand
  - ii) Copper losses
  - iii) Luminous efficiency
- b) Explain the selection and location of transformer for improving power factor. [7]

OR

- Q10)** a) Discuss various factors which constitute the billing amount for a medium scale industry. [7]
- b) Explain different losses occurring in electric motors. [6]
- Q11)** a) Define Waste heat Recovery. Describe its benefits and potentials of savings in industry. [7]
- b) Describe suitable factors influencing selection of cogeneration plant. [6]

OR

- Q12)** a) Explain topping cycle and the bottoming cycle with sketch. [6]
- b) Describe heat wheel used for waste heat recovery with neat sketch. [7]

