Total No. of Questions :12]

SEAT No. :

P3314

[Total No. of Pages :3

[4959]-35
B.E. (Mechanical)
Energy Audit and Mangement
(2008 Course) (Semester -I) (Elective - I)(402044A)

Time : 3 Hours] *[Max. Marks :100*

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 side indicate full marks.***
4) ***Use of Lagarithmic tables, slide rule, electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***

SECTION -I

Q1) a) Why energy conservation is important in the prevailing energy scenario? **[8]**

b) Explain current energy consumption pattern in global and Indian industry. **[8]**

OR

Q2) a) Write short note on. **[8]**

i) Energy security and reliability.

ii) Energy and environment.

b) Discuss different aspects of Energy Policy and strategy in energy Conservation systems. **[8]**

Q3) a) Write short note on. **[10]**

i) Responsibility of energy auditor.

ii) Energy Audit software.

b) State and explain the function of measuring instrument used for energy audit? **[8]**

OR

P.T.O.

Q4) a) Explain the aim of energy audit. Accurate measurement is very important in energy audit. Why? **[8]**

b) Describe Energy conservation opportunities in pumping systems. **[10]**

Q5) a) Explain following financial analysis methods. **[8]**

i) Present value of money.

ii) Sensitivity analysis.

b) Determine simple pay back period for a boiler that cost Rs.75 lakhs to purchase and Rs.5 lakhs per year on an average to operate and maintain and is expected to save Rs.30 lakhs. **[8]**

OR

Q6) a) Describe advantages and drawbacks of simple payback period financial technique. **[8]**

b) How you will determine cost of electricity generated in case of steam power plant? **[8]**

SECTION -II

Q7) a) A centrifugal pump lifts 50 litres/s water under a static head of 18m. The suction and delivery pipes are both of 15cm diameter. The lengths of suction and delivery pipes are 8m and 60m respectively. If the overall efficiency is 75%, find the power required to drive the pump. Assume the Darcy's friction factor $f = 0.03$ **[8]**

b) Describe energy saving opportunities in compressed air system. **[8]**

OR

Q8) a) What are the measures to be taken for efficient operation of HVAC System? **[8]**

b) Explain in brief steam trap and why it is important in thermal power plant. **[8]**

Q9) a) What possible improvement measure you would look for general lightening system. **[9]**

b) What are the types of lamps used in lighting system? Write down their features with typical application. **[9]**

OR

Q10)a) Explain the following terms. **[9]**

i) Power Factor.

ii) Maximum Demand.

iii) Copper losses.

b) What are different types of motor? Explain motor speed control systems. **[9]**

Q11)a) Explain cogeneration systems using the back pressure turbine, extraction-condensing turbine and double extraction back pressure turbine. **[8]**

b) Describe direct and indirect benefits of waste heat recovery? **[8]**

OR

Q12)a) Explain how cogeneration is advantageous over conventional power plant. **[8]**

b) Describe heat wheel used for waste heat recovery with neat sketch. **[8]**