SUBJECT CODE-221
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2015
Energy Conservation & Audit
(Revised)

[Time: Three Hours] **[Max. Marks: 80]**

"Please check whether you have got the right question paper."

N.B I) Q. No. 1 and 6 are compulsory.
  ii) Attempt any two questions. Each from section – A and section – B
  iii) Assume suitable data if required.

Section – A

Q.1. Attempt any five 10
  a) What are the applications of bottoming cycle?
  b) Define energy audit as per energy – conservation act – 2001.
  c) Write the statements of laws of thermodynamics
  d) If the % of oxygen in flue gas is 7% calculate the excess air required for combustion
  e) What is role of BEE in achieving energy efficiency of our country?
  f) What is co-generation? Draw the bolus diagram of co-gen. system
  g) What is emission trading?
  h) How much CO_2 emissions in tons could be reduced annually by replacing 60 watts in candescent lamp with 15 CFL if CO_2 emission is 1kg CO_2 per KWh, and annual burning is 3000 hours?

Q.2 a) Measurements are an essential part of energy – Audi , why? Also name various electrician & mechanics instrument used in energy-Audit. 07
  b) Explain :- 08
   a) Kyoto protocol
   b) Energy manager responsibilities

Q.3 a) List out energy conservation opportunities in Boiler-plant of a thermal power station. 07
  b) What is co-generation & with the help of diagram explain 08
   i) Book pressure turbine
   ii) Extraction condensing turbine cogeneration system.

Q.4 a) Explain in detail the steps to calculate boiler efficiency by indirect method. 08
  b) What is waste heat recovery systems what are devices used for it 07

Q.5 Write note : (any three) 15
  a) Role of renewable energy sources in energy management of nation
  b) Clean development mechanism & its objectives
  c) Kyoto protocol
  d) Carbon trading

Section – B

Q.6 Attempt any five 10
  a) What are the different methods of financial evaluation
  b) How will you calculate the discount factor
  c) What is meant by profitability index for energy conservation projects?
  d) If the maximum demand of a factory is 3500 KVA at 0.88 P.F. the max.oem and will reduce by -------- KVA if p. f. improved to 0.98
  e) What is IRR ?

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f) What is meant by "peak clipping" and "villey filling" in case of DSM?
g) For lighting system define room index
h) What is meant by TOD – tariff?

Q.7 a) Explain IRR with advantages & limitation 07
b) Explain the importance of power factor in energy – consternation program. 08

Q.8 a) A proposed energy improvement project requires an initial investment of Rs.5,00,000 = 00 & generates cash 07
flows as given below
Year savings
1 1,20,000
2 1,15,500
3 1,30,000
4 1,16,500
5 1,17.250
6 2,00,000
Calculate the NPV of the proposal at the discount rate of 11%
b) Explain various components of electricity billing as applicable to an industrial consumer 08

Q.9 Explain in detail the procedure to conduct the energy auditor a typical thermal power plant which instruments are 15
require for performance evaluation of TPS? Suggest measures to be taken to improve the overall performance of TPP.

Q.10 Write short notes on (any 3) 15
a) Electrical local management.
b) Energy efficiency and optimization.
c) Harmonics with its sources and causes.
d) E. A. 2003 n& Energy sector reform.