[Total No. of Printed Pages:2] **CODE NO:- Z-491**

FACULTY OF ENGINEERING & TECHNOLOGY

T.E.(EEP/EE/EEE)Year Examination June– 2015

Energy Conservation And Audit.

(Revised)

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

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

i) Q. No. 1& 6 are compulsory.

ii) Attempt two questions each from SECTION-A & SECTION-B

iii) Assume suitable data, if required.

SECTION A

Q.1 Attempt any five 10

a) Define "Energy –Audit" as per the Energy conservation Act-2001.
b) What is meant by Global- Warming potential?
c) The efficiency of boiler was improved from 70% to 80%. What would be the percentage fuel saving?
d) Which instrument is used to measure air Velocity and air flow in a duct?
e) Write the statement of second Law of Thermodynamics.
f) If the percentage of oxygen in flue gas is 7%, Calculate the excess air required for combustion.
g) Define 'ton' of Refrigeration.
h) What is meant by Evaporation Ratio in case of steam boiler?

Q.2 a) What are the duties and responsibilities of Energy –Manager as per the Energy- conservation Act 2001? 08

b) "Measurements are an essential part of Energy-Audi". Why? Also name various electrical and mechanical instruments used in Energy-Audit. 07

Q.3 a) Which parameters are to be monitored for evaluation the efficiency of boiler by direct method and write the formula for boilerefficiency? 08

b) A steam power station of 100 MW Capacity uses coal of calorific value 6400 Kcal /kg. The thermal efficiency is 30% and electrical efficiency is 92% .Find the coal required per hour when the plant is working at full load. 07

Q.4 a) Write the procedure to carry out energy –audit of compressed air system. 07

b) What is Co. generation& with the help of diagram explain 08

i) Book pressure Turbine
ii) Extraction condensing Turbine- Co-generation system

Q.5 Write short notes on any three 15

a) CDM and its objectives
b) Energy & sustainable development
c) Energy Audit of HVAC system
d) Energy conservation Act.2001.

SECTION-B

Q.6 Attempt any five .Objective questions 10

a) Define power factor & write the specifications for P.F. improvement capacitors.
b) If the maximum demand of a factory is 3500 KVA at 0.88 P.F. then the maximum Demand will reduce to by –KVA. If the P.F. is improved to 0.98.
c) Define NPV –giving the standard formula to calculate NPV.
d) What is IRR as applied to the financial evaluation of a project?
e) What is meant by TOD –Tariff?
f) What is DSM? How if helps in Energy- management?
g) Calculate the fixed –energy consumption for a rolling will consuming 3, 00,000 units electricity to produce 500MT product per month and having specific energy consumption of 500Kwh /MT.
h) For light system, define room- Index.

Q.7 a) Explain simple- pay-Book Period method & its advantages and disadvantages. 08
b) Give comparison between NPV and IRR method of financial analysis. For Energy conservation projects 07

Q.8 a) Explain the importance of power-factor in energy –conservation program. 08
b) An industrial plant is consuming 400KW power with a maximum demand of 520 KVA . the demand charge is Rs .300/KVA per month .Determine the savings possible by improving the P.F. to 0.95 and the payback period if investment on capacitor bank is Rs 3,00,000 07

Q.9 Explain in detail the procedure carry –out the energy audit of a typical thermal power plant .Which instruments are required to evaluate the performance ?suggest energy conservation measures to improve the performance of thermal power .plant 15

Q.10 Write short notes on any three 15

a) Advantages of DSM
b) E.A.2003 & Energy sector Reform
c) Electricity Tariff-applicable to industrial consumers
d) Energy performance Assessment of a typical steel-plant