

Centre for Open and Distance Learning
TEZPUR UNIVERSITY
DRE 201: Energy Management and Auditing

Assignments
Full Marks: 30

1.
 - (a) Explain the meaning of fuel substitution and energy substitution with examples
 - (b) Differentiate between *supply side management* and *demand side management*. Elaborate how the former can be implemented by the electrical utilities.
 - (c) How do you calculate the efficiency of a boiler? Discuss four major energy conservation opportunities in a boiler system.
 - (d) A boiler operator is trying to reduce excess air level from 30% to 10% in a coal fired boiler. Describe, what will most likely happen to the CO and CO₂ concentration as well as unburnt carbon in the flue gas. Explain your answer.

4×4=16

2. A plant is using 4 tons/day of coal to generate steam. The calorific value of the coal is 4000 kcal/kg. The cost of coal is Rs. 2000/tone. The plant substitute coal with rice husks, as a boiler fuel, which has a calorific value of 3000 kcal/kg and cost Rs. 700/tone. Calculate the annual cost savings at 300 days of operation, assuming the boiler efficiency decreases from 78% on coal to 72% on rice husks.

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3. An investment of Rs. 1.0 lakh is made for a variable speed drive at the beginning of the year, which is also the date of operation. Savings expected over 4 years are Rs. 30,000, Rs. 30,000, Rs. 40,000 and Rs 45,000 respectively. Find out the Net Present Value at the end of the 4th year, if the discount rate is 12%. Also calculate the IRR.

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