Tezpur, Assam- 784028

ASSIGNMENT FOR AUTUMN SEMESTER END EXAMINATION, 2018

Course Name - Energy Management and Auditing
Course Code- DRE 201

1. **Short type questions**
   (a) Discuss the difference between energy efficiency and energy conservation.
   (b) Why short term payback is an inadequate yardstick for assessing longer term benefits?
   (c) List any four important factors involved in deciding the final cost of purchased electricity.
   (d) Why *sankey diagram* is useful in energy balance calculations?

   4×4=16

2. A thermic fluid heater with furnace oil is replaced by a coconut chip fired boiler having the following details. Find out the payback period based on the cost savings.

Average efficiency of fuel oil fired boiler system	80 %
Average efficiency of coconut chip fired boiler system	70%
GCV of furnace oil	10200 kcal/kg
GCV of coconut chips	4000 kcal/kg
Heat duty requirement	20 lakh kcal/hr
Annual operating hour	7000 hours
Investment of coconut chip fired boiler system	Rs. 100 Lakhs
Cost of furnace oil	Rs. 20 /litre
Cost of coconut chips	Rs. 3000 /ton
Density of furnace oil	0.90 kg/litre

   7

3. An energy auditor recommended to replace an old air fan and inefficiently designed air delivery duct system which is causing Rs 23 lakh per year in electricity cost with a modern backward curved fan with adequately designed duct system with an investment of Rs 2.2 lakh. The expected electricity cost reduction is 5% by using the new system. Considering over 15 years sustained savings, calculate the Internal Rate of Return (IRR).

   7

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