ASSIGNMENT FOR AUTUMN 2021 AND SPRING 2022 EXAMINATION

COURSE NAME- ENERGY MANAGEMENT AND AUDITING
COURSE CODE- DRE 201

1. **Short type questions:**   **4x4= 16**
   (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?

2. A thermic fluid heater with furnace oil is replaced by a coconut chip fired boiler having thefollowing details. Find out the payback period based on the cost savings.   **7**

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

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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