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Centre for Energy Studies
Indian Institute of Technology Delhi

ESL 750: Economics and Planning of Energy Systems

Time: One Hour

Minor Test - I (2013-2014 batch)

Maximum Marks: 15

Note: Please answer all questions. The marks assigned to each question for the purpose of evaluation are indicated within square brackets at the end of the question. The total marks scored would be normalized for the actual weight age of 15 marks for the Minor Test - I.

1. Explain why
 - (a) Energy-GDP elasticity of a country should be less than unity?
 - (b) Money has a time value?
 - (c) Deciding the spacing between risers of a flat plate solar collector may involve economic considerations?
 - (d) Energy demand should be estimated accurately and also much before the expected time of energy use? [12]
2. Explain the differences between
 - (a) Cross Elasticity of Demand and Price Elasticity of Demand
 - (b) Energetic Feasibility and Financial Viability of a renewable energy project
 - (c) Uniform Series Present Worth Factor and Uniform Series Capital Recovery Factor [6]
3. A household currently uses an electric geyser (with 95% efficiency of electricity utilization for water heating) to meet its daily hot water demand of 180 liters at 40 °C. Use of a domestic solar water heating system that heats water from 15 °C to 60 °C is expected to satisfy 70% of annual water heating demand of the household. The initial temperature of fresh water supply is 15 °C. The present unit price of electricity is Rs. 6/kWh and the same is expected to increase at an annual rate of 8%. Determine the cumulative present worth of monetary savings likely to accrue to the household due to electricity saved with the use of domestic solar water heating system during its useful life of 30 years if the discount rate is 10% and the specific heat of water is 4.18 kJ/kg °C. [7]
4. Describe a procedure to estimate the amount of carbon dioxide likely to be mitigated with the replacement of incandescent bulbs being used by a household with CFLs if the electricity being used by the household is being produced in a coal thermal power plant. [5]