Centre for Energy Studies
Indian Institute of Technology Delhi
ESL 750: Economics and Planning of Energy Systems
Time: One Hour **Minor Test - II (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 - II.

1. Explain why
   (a) The cost of electricity produced by a solar power plant is expected to be more stable in the long term as compared to the cost of electricity produced by a fossil fuel based power plant?
   (b) It is necessary to carefully identify the independent parameters to be used in econometric models?
   (c) Time-trend models should preferably be used for short term demand forecasting only? **[9]**
2. Explain the differences between (any two)
   (a) Simple and Discounted Payback Period
   (b) Inter-Fuel substitution and Inter-Factor substitution
   (c) IRR and MARR **[4]**
3. Describe and discuss different possible reasons for inability of an econometric model in explaining the variation in the dependent variable with the variation in the values of independent variables. **[5]**
4. Derive an expression for discounted payback period of an investment in a renewable energy project if the net annual benefits from the project are expected to be uniform over its useful life. Also define the condition for a finite value of discounted payback period. **[5]**
5. Determine the levelized unit cost of electricity produced by a stand-alone solar thermal power plant and study its sensitivity with respect to discount rate and useful life with the following base values of the input parameters:

Nominal capacity of the plant	: 10 MW
Capital cost of the plant	: Rs. 150 crore
Useful life of the plant	: 20 years
Annual cost of operation and maintenance	: 3% of capital cost
Annual capacity utilization factor of plant	: 0.20
Discount Rate	: 0.10

Present the results in tabular form. **[7]**