



**STRATHMORE UNIVERSITY**  
**SCHOOL OF COMPUTING AND ENGINEERING SCIENCES**  
**MASTER OF SUSTAINABLE ENERGY TRANSITION**  
**MSSET 8504: ENERGY ECONOMICS**

**DATE: 16<sup>th</sup> DECEMBER 2024**

**TIME: 18:00-20:30 HOURS**

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**INSTRUCTION**

1. This examination contains **FOUR** questions.
  2. Attempt **Question ONE (COMPULSORY)** and any other **TWO** questions
  3. All workings should be shown clearly.
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**QUESTION ONE**

**[20 MARKS]**

- a) Define Energy Economics and clearly highlight some of the questions that the field of energy economics tries to answer **[5 marks]**
- b)
  - i) With illustration describe the concept of negative energy pricing stating the causes and the negative impacts associated with it.
  - ii) Discuss some of the ways negative prices for energy producers can be mitigated **[7 marks]**
- c) Explain how the energy needs can be met sustainably based on three core dimension of the energy trilemma. **[5 marks]**
- d) Briefly highlight how energy is traded on a Day-Ahead Basis **[3 marks]**

**QUESTION TWO****[15 MARKS]**

- a)
- i) Using an illustrative example explain how the system equilibrium price is arrived at in the case of energy auctions market.
  - ii) Why is it important for energy to be traded using this equilibrium price as opposed to relying on individual bids and offers? **[8 marks]**
- b) Discuss how the following approaches can be used energy demand forecasting clearing stating the merits and demerits of each approach
- i) Direct Surveys
  - ii) Artificial Neural Networks Approach **[7 marks]**

**QUESTION THREE****[15 MARKS]**

- a) Explain how the high cost of financing affects energy sector investments in developing countries **[7 marks]**
- b) Discuss how the use of energy in a society is related to the economic status and human development index **[8 marks]**

**QUESTION FOUR****[15 MARKS]**

Discuss the following economic based energy demand side management approaches

- a) Time-of-Use (TOU) Pricing **[3 marks]**
- b) Critical Peak Pricing (CPP) **[3 marks]**
- c) Real-Time Pricing (RTP) **[3 marks]**
- d) Inclined Block Rate (IBR) **[3 marks]**
- e) Peak-Time Rebate (PTR) **[3 marks]**