UNIVERSITY EXAMINATIONS

2ND SEMESTER 2023/2024 ACADEMIC YEAR

THIRD YEAR EXAMINATION FOR THE DEGREE BACHELOR OF SCIENCE IN ECONOMICS AND STATISTICS AND BACHELOR OF ECONOMICS & SOCIOLOGY

ECON 324: ENERGY & ENVIRONMENTAL ECONOMICS

STREAM: *TIME: 2 HRS*

DAY: MONDAY [2.30-4.30 P.M]   *DATE: 15/04/2024*

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

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INSTRUCTIONS:

Answer question ONE, and any other TWO questions. Question one carries 30 Marks and all other questions carry 20 Marks each.

QUESTION ONE (30 marks)

  a) Briefly distinguish these terms as as used in both energy and environmental economics
   i)   Storable renewable resources and Non-storable renewable resources   **(1 Marks)**
   ii)   Shadow price and Market price   **(1 Marks)**
   iii)   Sustainable and Unsustainable development   **(1 Marks)**
   iv)   Energy resources and Energy commodities   **(1 Marks)**
   v)   Contingent Valuation methods (CVM) and Travel Cost Methods   **(1 Marks)**

  b) "Most environmental degradation problems can be traced back to imperfectly defined property rights". Using relevant examples discuss this statement.   **(5 marks)**

  c) i) Suppose that an environmental regulatory authority introduces a requirement that all polluting firms reduce their pollution by 20 per cent even though the cost of pollution varies widely from one polluter to another. Using an illustrative example, explain why this regulation might be inefficient
   ii) Briefly discuss an alternative policy approach that would be more efficient.

   (10 marks)

  d) "A pollution regulating authority can use different instruments to implement chosen targets of pollution levels. Which instrument to use are often decided dependent of criteria like efficiency and distributional effects". A polluting activity is given by the following;

   Total damage function $TD = 100 + 2M^2$

   Total abatement cost function $TAB = 300 + 60M - M^2$,
   where M is the flow (quantity) of emission per period.
   Required;

      i)   Which level of pollution flow is chosen by an unregulated activity and which is the social efficient one?   **(7 marks)**

      ii)   Illustrate your solution in a diagram   **(3 marks)**

QUESTION TWO   (20 marks)

  a) Beatrice is a smoker. Alfred is a non-smoker whose health is adversely affected by Beatrice's second-hand smoke. Explain how they can bargain to a Pareto optimal equilibrium and illustrate the possible solutions given different initial property rights.   **(5 Marks)**

b) The economic approach to environmental problems starts from the assumption that resource allocation is done via markets and market prices, but that in the presence of environmental problems, markets ' fail' in a certain sense. Explain the reason and nature of market failures related to energy and environmental problems **(5 Marks)**

c) Briefly explain any five relevant policies which can be adopted to correct market failure in the energy and environmental sectors. **(10 Marks)**

QUESTION THREE (20 marks)

a) Explain any five roles of the government of Kenya in the energy pricing policies

(10 Marks)

b) In a partial equilibrium model of a production externality, show under what circumstances taxes and standards are equivalent in terms of their effect on pollution levels **(10 Marks)**

QUESTION FOUR (20 marks)

a) Every time your neighbor cooks on his outdoor grill, fumes come into your bedroom window making you very upset. The National Environment Management Agency does not regulate smoke from grills.

Required:
i) Use Coase Theorem to recommend solutions to the above problem? **(5 marks)**
ii) How does this solution differ from what Pigou would recommend? **(5 marks)**

b) Explain any five determinants of foreign direct investment (FDI) in oil industry

(10 Marks)

QUESTION FIVE (20 marks)

a) Explain any five effects of a shortfall in energy supply on national development of a country like Kenya **(10 Marks)**
b) Discuss cost effectiveness as a criterion for choosing instruments in environmental policy
(10 marks)