



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

**UNIVERSITY EXAMINATIONS FOR THE DEGREE IN RENEWABLE ENERGY,
TECHNOLOGY AND MANAGENT**

4TH YEAR 1ST SEMESTER 2018/2019 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TET 3414

COURSE TITLE: ENERGY AND CLIMATE CHANGE

EXAM VENUE: _____ STREAM: BSc REN ENERGY TECH. & MGT.

DATE: ../12/2018 EXAM SESSION: _____

DURATION: 2 HOURS

Instructions

- 1. Answer question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**



- a. Explain the following terms as used in energy and climate change:
 - i. Climate (1 mark)
 - ii. Climate change (1 mark)
 - iii. Greenhouse effect (1 mark)
 - iv. Climate system (1 mark)
- b. Climate change discussions are always coming up in environmental stakeholders meetings or seminars in Kenya. State and explain how Kenyans can cause climate change? (5 marks)
- c. Renewable energy sources are connected with climate change in very complex ways. The use of renewable energy can affect the magnitude of climate change while the magnitude of climate change can affect their prospects for use. Discuss this statement. (10 marks)
- d. Energy and climate change are interlinked. State and explain at least four possible relationships of climate change with other energy-related issues. (8 marks)
- e. Why does climate change matter? (3 marks)

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QUESTION TWO

- a. Discuss the Delta-change method as a technique used for modelling climate change impacts on hydropower systems. (5 marks)
- b. Bondo County is interested in understanding the effects of climate change on energy production and distribution. As an upcoming energy expert, using examples give a detailed description of the effects of climate change on energy production and distribution. (15 marks)

QUESTION THREE

- a. State and explain the characteristics of climate system components (5 marks)
- b. KenGen and Kenya Power Limited have approached you to discuss the effects of climate change on energy use. State and explain five effects of climate change on energy use (10 marks)
- c. Climate change is likely to affect energy planning nationally or regionally. Explain this statement (2 marks)
- d. Temperature increases resulting from global warming are almost certain to reduce the amount of energy needed for space heating in a residential building. Explain this statement (3 marks)

QUESTION FOUR

- a. Briefly discuss Sima model as an ecosystem model used to ascertain climate change impacts on forest biomass for fuel production. (5 marks)
- b. The Ministry of Energy and Petroleum, Kenya, is interested in understanding the observed climate changes and impacts. An officer at the Ministry has met with you, renewable energy expert, for one on one discussion. State and explain ten observed climate changes and impacts (10 marks)
- c. A key pillar of several countries' mitigation strategies is decarbonization of the energy sector through renewable energy deployment. Discuss this statement, giving relevant examples. (5 marks)

QUESTION FIVE

- a. Climate change is driven by the accumulation in the Earth's atmosphere of heat trapping greenhouse gases resulting from anthropogenic activities. Explain this statement using relevant examples. (2 marks)
- b. Energy production in Kenya is partly dominated by renewable energy sources. Renewable energy sources tend to be more sensitive to climate variability. Discuss this statement (10 marks)
- c. Climate changes have direct effects on energy production and use. In some cases, climate changes may have a number of indirect effects on certain institutions and localities. Discuss this statement (8 marks)