



**JARAMOGI OGINGA ODONGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

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

**4<sup>TH</sup>YEAR 1<sup>ST</sup>SEMESTER 2018/2019 ACADEMIC YEAR**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: TET 3412**

**COURSE TITLE: ENERGY AND CLEANER PRODUCTION**

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

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

**DURATION: 2 HOURS**

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### **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**

### **QUESTION ONE**

- a) What do you understand the term zero wastage. (2 Marks)
- b) What is Cleaner Production? Explain in detail (6 Marks)
- c) Discuss the four basic guiding principle of cleaner production. (8 Marks)
- d) What distinct environmental effects are associated with these power plants;
  - i. Wind.
  - ii. Solar thermal.
  - iii. Electricity Transmission (8 marks)
- e) Enlist and explain the benefits of CP. (6 marks)

### **QUESTION TWO**

- a) As a clean development official who supervises the erection of new power plants highlight five major areas where you can be strict as you try to prevent pollution from power plants giving detailed examples of the same. (12 Marks)
- b) Explain barrier to implement cleaner production in industries.(8 Marks)

### **QUESTION THREE**

- a) What do you understand by the following terms as used by the UNFCCC
  - i. Kyoto protocol? (2 marks)
  - ii. Clean Development Mechanism. (2 marks)
  - iii. Certified emission reduction (2 marks)
- b) A part from CDM, list the other two mechanisms established by the protocol. (2 marks)
- c) Discuss CDM and highlight the three major objective for this mechanism. (6 marks)
- d) What are the benefits of CDM to developing countries? (4 marks)
- e) List four examples of CDM projects in Kenya. (2 marks)

### **QUESTION FOUR**

- a) What are the three main aspects that make an energy source sustainable? Give three examples of sustainable energy sources. (5 marks)
- b) Why do people use fossil fuels, instead of alternative fuels if alternative fuels are supposed to be better for the environment? (5 marks)
- c) Explain the negative environmental impacts of coal as a source of energy. (10 marks)

### **QUESTION FIVE**

- a) Acid rain is a menace in industrialized regions. Stating the role of energy generation and processing, briefly explain the formation of acid rain. (2 marks)
- b) What do you understand by the following terminologies;
  - i. Global warming? (2 marks)
  - ii. Greenhouse effect (2 marks)
- c) List four examples of greenhouse gases. (2 marks)
- d) As a consultant of an organization in Uasin-Gishu county where we have wheat and maize farmers who want to produce gas from their crop wastes and use it to run an engine. Give possible ways to extract energy from these wastes explain all processes fully. (4 Marks)
- e) A sample of analyzed air at 0°C and 1 atm pressure is reported to contain 9 ppm of CO. Determine the equivalent CO concentration in micrograms per cubic meter and milligrams per cubic meter. (3 marks)
- f) Derive Stokes equation for particle settling in an environment. (5 Marks)