



JARAMOGI OGINGA ODONGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DEGREE IN SCIENCE IN RENEWABLE

ENERGY TECHNOLOGY AND MANAGMENT

1STYEAR 1STSEMESTER 2018/2019 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TET 3111

COURSE TITLE: INTRODUCTION TO RENEWABLE ENERGY AND MANAGEMENT

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**
- 4. Use well labeled diagrams**

Question 1

As the solar short wave radiation passes through the Earth's atmosphere, a set of interactions do occur.

- Explain with an aid of a diagram the term direct and diffuse beams. (5 marks)
- Expound on the Terms Green House effect and Reflection of the extraterrestrial solar intensity (6 Marks)
- The solar short wave and the atmospheric long wave spectral distributions are divided into regions or limits that helps in explaining the important absorption processes. Name and explain each of the five divisions.(19 Marks)

Question 2

A hydraulic ram is an example of a hydropower device used mostly in remote rural areas; Sketch the device and explain the ten steps of its operation principle (20 marks)

Question 3

Turbines can be categorized into two overarching classes based on the orientation of the rotor.

- Name the categories (0.5 Marks)
- Sketch and name the main parts of an Horizontal axis wind turbine.(5 Marks)
- State the disadvantages of the Vertical axis wind turbine (10 Marks)
- Write down the general equation of power and wind speeds of a wind turbine. Describe the importance of each parameter. (4.5 Marks)

Question 5

- Define the term renewable energy and non- renewable energy and give three examples for each. (6 marks)
- Give two other terminologies for the terms renewable and non- renewable energy (3 Marks)
- Define the terms energy conservation and energy efficiency (3 Marks)
- Name the possible sources of energy for use in Kenya in a descending order. (5 Marks)
- State or give an example of where the energy source is found. (3 Marks)