



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 2017/2018 ACADEMIC YEAR
CENTRE: MAIN CAMPUS

COURSE CODE: TET 3413

COURSE TITLE: ENERGY CONSERVATION AND MANAGEMENT

EXAM VENUE: CR

STREAM: BSc REN ENERGY TECH. & MGT.

DATE: 18/12/2017

EXAM SESSION: 2.00 – 4.00 PM

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**

1. (a) Briefly illustrate Primary energy as the first stage of energy supply chain **(4mks)**
(b) According to World Energy Council 2016 report , increased investment on renewable technologies and reduction in the demand of fossil fuel, has revolutionized secondary sources of energy. Using examples, define secondary energy, which is the second component of energy supply chain **(6mks)**
(c) As a renewable energy expert working in conjunction with Ministry of Energy , explain energy conversion efficiency and measures you would recommend to save and conserve energy at both national and local levels **(10mks)**
(d) The Ministry of Industrialization in conjunction with Kisumu county is encouraging investors to invest more on Tri-generation (CCHP) and Co-generation (CHP) systems. As an upcoming energy expert elaborate the merits of these systems in relation to energy conservation **(10mks)**

2. (a) explain energy storage in relation to energy conservation and management **(3mks)**
(b) World Energy Council considers Water Reservoir as the most efficient energy storage method. Discuss the various ways in which energy can be stored for future use **(8mks)**
(c) Efforts by the Kenya government to encourage energy conservation have received tremendous support in both public and private sectors. One of the measures is energy storage, what are the benefits of this measure at national and local level **(9mks)**

- 3.(a) Define energy efficiency and explain its benefits **(4mks)**
(b) The Kenya government in conjunction with NEMA are campaigning and disseminating information on importance of energy management at home. What are the energy conservation measures that can be undertaken at home **(8mks)**
(c) Kenya Manufacturers Association in conjunction with Transport sector are both affected by high oil prices and increasing energy costs. As a renewable energy expert what are the energy efficiency measures you can advise both sectors **(8mks)**

- 4.(a) Explain waste heat recovery in relation energy conservation and management **(4mks)**
(b) BIDCO company, located in Thika town, intends to apply co-generation system (CHP) in its production system as a measure to curb waste heat loss. Discuss the benefits of co-generation systems in relation to energy management **(6mks)**
(c) The Ministry of Energy has been campaigning for energy conservation as a result of increasing electricity cost incurred by manufacturer. As a renewable energy expert discuss how companies could recover waste heat which constitute more than 80% of energy loss **(10mks)**

- 5.(a) Define energy conversion systems and its relevance to energy conservation **(4mks)**
(b) As an energy auditor at BIDCO manufacturing plant, point out the main areas where some of the energy losses are likely to occur in the firm **(8mks)**
(c) During energy auditing process what are the energy efficiency measures that you can recommend to the plant manager and the benefits arising thereof if well implemented **(8mks)**