JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DEGREE OF SCIENCE IN RENEWABLE ENERGY TECHNOLOGY AND MANAGEMENT

FOURTH YEAR FIRST SEMESTER 2015/2016 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TET 3415

COURSE TITLE: ENERGY AND BUILT ENVIRONMENT

EXAM VENUE: AH2 **STREAM: BSc RE TECH & MGT**

DATE: 15/10/2015 **EXAM SESSION:9.00 – 11.00 AM**

TIME: 2 HOURS

Instructions to candidates

The paper contains FIVE questions.

Answer question ONE and any other TWO questions

QUESTION ONE (COMPULSORY)

a. Describe in details what is energy and built environment. (3 Marks)
b. Define energy conservation? (1 Marks)
c. State and explain various passive solar energy systems that can be used in a building. (10 Marks)
d. As an upcoming energy expert, describe what or how tomorrow energy efficient building should look like. (5 Marks)
e. Describe design objectives of a whole building design. (8 Marks)
f. Explain what is meant by optimization of energy efficiency . (3 Marks)

QUESTION TWO

Under criteria for architectural, mechanical, electrical and building system components describe the following;

a. Site and building orientation (10 Marks)
b. Envelope and façade design (3 Marks)
c. HVAC system performance (4 Marks)
d. Daylight and lighting analysis (3 Marks)

QUESTION THREE

a. State two major aspects that matter during the planning of technical services and logistics for building systems. (2 Marks)
b. Describe any four of the principles of energy efficiency building system. (8 Marks)
c. Describe passive energy system. (4 Marks)
d. Describe triple bottom line goals as far as buildings and building efficiency is concerned. (6 Marks)

QUESTION FOUR

a. From energy and environmental building concept standpoint, describe the strategy for design involved (7 Marks)
b. How can unwanted energy flows with too much energy leaving or entering building via windows be corrected? (3 Marks)
c. As an upcoming renewable energy expert, describe how you can achieve cost-effectiveness from energy conservation measures? (5 Marks)
d. State any five passive solar energy systems (5 Marks)

QUESTION FIVE

a. State the general expression for the energy balance as used in energy conservation. (1 Mark)
b. Describe intelligent lighting systems. (5 Marks)
c. Describe three optimization control measures that can be considered when building a house. (6 Marks)
d. Describe intelligent energy efficient buildings. (8 Marks)