



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

SCHOOL OF ENGINEERING AND TECHNOLOGY

**UNIVERSITY EXAMINATIONS FOR THE DEGREE IN SCIENCE IN
RENEWABLE ENERGY TECHNOLOGY AND MANAGMENT**

FOURTH YEAR RESIT EXAMINATIONS 2020/21 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TET 3415

COURSE TITLE: Energy and Built Environment

EXAM VENUE:

STREAM: BSc REN TECH & MGT

DATE: ../11/2020 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**

QUESTION ONE (COMPULSORY)

- a. Describe energy and built environment. (3 marks)
- b. What is energy conservation? (1 mark)
- c. State and explain various passive solar energy systems. (10 marks)
- d. As an upcoming energy expert, describe what or how tomorrow's energy efficient building should have? (5 marks)
- e. Describe design objectives of a whole building design. (8 marks)
- f. What does optimization of energy efficiency mean? (3 marks)

QUESTION TWO

- a. State the general expression for the energy balance as used in energy conservation. (1 mark)
- b. Describe the concept of intelligent lighting as used in energy and built environment. (5 marks)
- c. Describe the three optimization control measures studied in this course. (6 marks)
- d. Describe intelligent energy efficient buildings. (8 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 either four of the principles of energy efficiency building system. (8 marks)
- c. Discuss the concept of passive energy system as used in this course. (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. (6 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, describe how you can achieve cost-effectiveness from energy conservation measures? (5 marks)
- d. State and explain the key characteristics of at least two buildings in Kenya that have embraced green energy technologies. (6 marks)

QUESTION FIVE

- a. Under criteria for architectural, mechanical, electrical and building system components describe the following:
 - i. Site and building orientation. (10 marks)
 - ii. Envelope and façade design. (3 marks)
 - iii. Daylight and lighting analysis. (2 marks)

- b. Bondo County government housing department has invited all stakeholders in the building industry: owners, occupants and entire society to deliberate on the need for efficient buildings. Explain the benefits of efficient buildings to all this stakeholders. (5 marks)