



# MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL STUDIES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN  
ENVIRONMENTAL STUDIES AND COMMUNITY DEVELOPMENT

ECD 110: ENVIRONMENTAL INNOVATIONS AND TECHNOLOGY

DATE: 2/6/2017

TIME: 11:00 – 1:00 PM

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**INSTRUCTIONS:**

*Answer Question ONE and ANY other Two Questions*

**QUESTION ONE (COMPULSORY) (30 MARKS)**

- a) Define the following terms.
- i. Innovation (2 marks)
  - ii. Technology (2 marks)
  - iii. Social innovation (2 marks)
  - iv. Smart city (2 marks)
  - v. Radical innovation (2 marks)
- b) Explain five drivers of environmental innovations (10 marks)
- c) Citing specific examples discuss five roles of technology in addressing environmental challenges (10 marks)

**QUESTION TWO (20 MARKS)**

Discuss the role of the following in promotion of environmental innovations

- a) Innovation policy (10 marks)
- b) Research (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Explain the five core elements of social innovation (10 marks)
- b) Using five case examples discuss how social innovation can be used for environmental protection (10 marks)

**QUESTION FOUR (20 MARKS)**

Discuss the contribution of the following energy technologies in enhancing environmental and community sustainability.

- a) Improved cook stoves (5 marks)
- b) Bio-energy technologies (5 marks)
- c) Solar heating technologies (5 marks)
- d) Energy saving bulbs (5 marks)

**QUESTION FIVE (20 MARKS)**

- a) List five barriers of environmental innovations in Kenya. (5 marks)
- b) Discuss the concept of integrated solid waste management highlighting the five stages of waste management hierarchy. (15 marks)