MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations 2015/2016

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL STUDIES

SECOND SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN ENVIRONMENTAL STUDIES

ECD110: ENVIRONMENTAL INNOVATIONS & TECHNOLOGIES

Date: 22/4/2016   **Time: 8.30-10.30 AM**

INSTRUCTIONS
   This paper consists of FIVE questions
   Answer question one and other two questions in this paper

QUESTION ONE

a) Explain the following terms

   i)   Overtech   (2 marks)

   ii)   Innovation   (2 marks)

   iii)   Smart cities   (2 marks)

b) Explain why the Americans prefer the leaf blower over the rake.   (4 marks)

c) Highlight reasons why the Spanish ship sank just after it had been launched   (2 marks)

d) i)   Explain the causes of smog over London in 1952   (4 marks)

   ii)   Explain the effects of smog on the inhabitants of London   (3 marks)

 e) Explain Darwin's theory of evolution and natural selection   (3 marks)

   i)   Explain two factors that hinder institutional innovation in Kenya   (2 marks)

   ii)   Explain how innovation data can be shared in the community   (2 marks)

f) Explain the Biogas production from cow dung.   (4 marks)

QUESTION TWO

a)   i)   Describe how the Clean Air Act (1956) was used to clear the air over London.

(4 marks)

         ii)   Give an episode of air pollution over the city of Louisville in 1950s in comparison to air Pollution over China today.   (4 marks)

         iii)   Explain how the Village green project in Durham, North Carolina was used in ambient air pollution monitoring in June, 2013.   (12 marks)

QUESTION THREE

a)   Explain FIVE environmental and FIVE human impact of the Chernobyl (Ukraine) nuclear accident that happened in April, 1986. .   (10 marks)

b)   Explain the events that culminated to Fukushima (Japan) nuclear accident in March, 2011.   (10 marks)

QUESTION FOUR

Explain the following elements to look at in a smart city

       i.   Smart energy

       ii.   Smart mobility

       iii.   Smart technologies

       iv.   Smart governance

       v.   Smart infrastructure   (20 marks)

QUESTION FIVE

a)   Define the term 'biomimicry'   (2 marks)

b)   Explain how biomimicry is applied in the creation of aircraft / drone wings for energy efficiency use and speed.   (8 marks)

c)   Explain the term 'Bioeconomy'   (2 marks)

d)   Discuss how the Rehabilitation of mangrove forest along the coastal area is a source of bioeconomy to its inhabitants.   (8 marks)