



MACHAKOS UNIVERSITY

UNIVERSITY EXAMINATIONS FOR 2017/2018 ACADEMIC YEAR

SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL SCIENCES

**SECOND YEAR, FIRST SEMESTER EXAMINATION FOR BACHELOR OF
ENVIRONMENTAL STUDIES (RESOURCE CONSERVATION)**

ERC 215: NATURAL RESOURCE MAPPING AND CARTOGRAPHY

DATE: 6/12/2017

TIME: 2.00-4.00 PM

-Instructions: Answer question one and ANY two other questions

Section A: 30 MARKS (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Explain the ways in which data can be entered into GIS platform (5 marks)
- b) Describe the THREE (3) scenarios of GIS table data which can be organized to solve environmental problems (6 marks)
- c) The data in table below were collected from Kajiado County. Use the data to answer the questions that follow;

Sample no.	X	Y	Soil erosion (%)	Water pollution (%)	Improper use of pesticides (%)	Improper disposal of waste (%)
1	38.23°	-01.26°	22	13	13	5
2	38.37°	-01.08°	34	17	12	6
3	38.27°	01.47°	12	19	10	9
4	38.09°	0.11°	14	10	20	11
5	38.18°	-01.43°	17	14	15	16

- i. Suggest the problem to be investigated (2 marks)
- ii. What are the possible causes of the problem? (3 marks)
- iii. Describe how you would organize the data to pose a satisfactory GIS query (7 marks)
- iv. Formulate a satisfactory GIS query (3 marks)
- v. Give the possible answer (4 marks)

SECTION B: 40 MARKS

QUESTION TWO (20 MARKS)

Use the data below to answer the questions that follow.

Table (a)

Shape	County	Sub-county	Soil erosion (%)	Deforestation (%)
point	Kitui	W	4	23
point	Kitui	X	8	17
point	Kitui	Y	6	27

Table (b)

shape	county	Sub-county	Soil erosion (%)	Deforestation (%)	Poor tillage (%)
point	Machakos	L	12	15	7
point	Machakos	N	17	18	6
point	Machakos	P	21	24	8

Table (c)

shape	county	Rainfall intensity	Topography
polygon	Kitui	Very high	steep
polygon	Machakos	high	Very steep

Table (d)

shape	county	Sub-county	Poor tillage (%)
point	Kitui	X	3
point	Kitui	Y	5
point	Kitui	W	8

Table (e)

shape	county	Sub-county	Soil erosion (%)	Deforestation (%)	Poor tillage (%)
point	Machakos	S	23	7	3
point	Machakos	R	27	9	5

- Suggest the problem to be investigated (1 mark)
- What are the possible causes of the problem? (3 marks)
- Describe how you would organize the data to pose a satisfactory GIS query (10 marks)
- Formulate a satisfactory GIS query (6 marks)

QUESTION THREE (20 MARKS)

The data below were collected from Nyamira County. Use the data to answer the questions that follow;

Sample no.	Release of methane gas (%)	Burning of agricultural wastes (%)	Deforestation (%)
1	8	6	15
2	7	7	17
3	4	4	19
4	9	2	12
5	6	4	14

- Suggest the problem to be investigated (2 marks)
- What are the possible causes of the problem? (3 marks)

- c) Describe how you would organize the data to pose a satisfactory GIS query (5 marks)
- d) Formulate a satisfactory GIS query (7 marks)
- e) Give the possible answer (3 marks)

QUESTION FOUR (20 MARKS)

Discuss how GIS technology can be applied in adapting to climate change and variability in
Isiolo County (20 marks)

QUESTION FIVE (20 MARKS)

Discuss how GIS technology can be applied to curb food insecurity in Bungoma County
(20 marks)