MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL SCIENCES

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR IN ENVIRONMENTAL RESOURCE CONSERVATION

ERC 215: NATURAL RESOURCE MAPPING AND CARTOGRAPHY

DATE: 22/7/2019 **TIME: 8.30-10.30 AM**

INSTRUCTIONS;

Answer question ONE and any other TWO questions

QUESTION ONE (30 MARKS)

a) Describe the 3 scenarios of GIS table data which can be organized to solve environmental problems (6 marks)

b) Explain the ways in which data can be entered in to GIS platform (5 marks)

c) The data in table below were collected from Bugoma County. Use the data to answer the questions which follow;

Sample no.	X	Y	Improper disposal of waste (%)	Improper use of pesticides (%)	Improper use of fertilizers (%)	Water pollution (%)
1	38.01^{o}	-0.06^{o}	11	3	13	15
2	38.13^{o}	-0.08^{o}	7	7	12	17
3	38.16^{o}	0.07^{o}	4	9	10	11
4	38.01^{o}	0.09^{o}	9	10	20	16
5	38.08^{o}	-0.01^{o}	8	4	15	18

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)

QUESTION TWO (20 MARKS)

Use the date below to answer the questions which follow.

Table (a)

Shape	County	Sub-county	Soil erosion (%)	Deforestation (%)
point	Kiambu	W	20	15
point	Kiambu	X	30	20
point	Kiambu	Y	40	10

Table (b)

shape	county	Sub-county	Soil erosion (%)	Deforestation (%)	Poor tillage (%)
point	Machakos	L	15	20	17
point	Machakos	N	20	25	19
point	Machakos	P	10	15	21

Table (c)

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

Table (d)

shape	county	Sub-county	Poor tillage (%)
point	Kiambu	X	15
point	Kiambu	Y	30
point	Kiambu	W	20

Table (e)

shape	county	Sub-county	Soil erosion (%)	Deforestation (%)	Poor tillage (%)
point	Machakos	S	20	18	12
point	Machakos	R	15	30	10

a) Suggest the problem to be investigated (1 mark)

b) What are the possible causes of the problem? (3 marks)

c) Describe how you would organize the data to pose a satisfactory GIS query (10 marks)

d) Formulate a satisfactory GIS query (6 marks)

QUESTION THREE (20 MARKS)

The data below were collected from Kisii County. Use the data to answer the questions which follow;

Sample no.	**Burning of agricultural wastes (%)**	**Deforestation (%)**	**Release of methane gas (%)**
1	18	26	5
2	17	27	7
3	14	24	9
4	19	22	2
5	16	24	4

a) Suggest the problem to be investigated (2 marks)

b) 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 to enhance livestock productivity in Tana River County

QUESTION FIVE (20 MARKS)

Discuss how GIS technology can be applied to enhance agricultural productivity in Bomet County