



**MASENO UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2013/2014**

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE  
DEGREE OF BACHELOR OF SCIENCE IN GEO-SPATIAL  
INFORMATION SCIENCE WITH INFORMATION TECHNOLOGY  
(MAIN CAMPUS)

**PGS 111: INTRODUCTION TO GEOGRAPHIC  
INFORMATION SYSTEMS**

*Date: 20<sup>th</sup> November, 2013*

*Time: 2.30 - 4.30 p.m.*

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**INSTRUCTIONS:**

- Answer Question ONE (COMPULSORY) and any other TWO questions.
- Sketch maps and diagrams should be used as deemed necessary.

**QUESTION 1: (INTRODUCTION)**

[30 Marks]

1. Define GIS? [4 marks]
2. State 3 components of Geographic Information Technologies. [6marks]
3. Describe five components of a functional GIS system. [10 marks]
4. Describe three components of ArcGIS software and state their functions [10marks]

**QUESTION 2: (GEOGRAPHIC DATA)**

[20 Marks]

1. What is geographical phenomenon? [2 marks]
2. Describe two types of geographical phenomena and give two example of each. [6 marks]
3. Explain 3 ways geographic phenomenon described in question 2 above are represented in GIS. [12 marks]

**QUESTION 3:(COMPUTER REPRESENTATION)**

[20 Marks]

1. The geographic phenomena in the table below are either geographic fields or geographic objects. Mark (*with X*) the correct answer for each phenomenon. Also indicate what suitable computer representation is by choosing from the list below (*one choice only*). *Tin, point, line, area, raster* [15 marks]

Phenomenon	Field	Object	Choose a suitable computer representation
Homabay Post office			
Temperature			
Kisumu Road network			
Air quality			
Lake Victoria			
Slope			
Emambung'o hills			
Migingo island			
Satellite image of Homabay			
Elevation			

2. Select the most suitable boundary type for each of the following phenomena using either [A. crisp B. fuzzy C. dynamic]. [5 marks]

Question item	Fill in the answer using Letter A, B or C
Administrative boundaries	
Soil pollution	
Forest areas	
Buildings	
Coast line	
Temperature	
Vegetation	
Lake shore	
Rivers	
Land use	

**QUESTION 4: (SPATIAL ANALYSIS)**

[20 marks]

1. What is spatial data analysis? [4 marks]
2. Describe four spatial data analysis functions you can perform using GIS [8 marks]
3. Police have not been able to track a car hijacking gang in the greater Kisumu County. How can they use GPS to narrow their search? [2 marks]
4. How would you represent Maseno university compound, Kisumu city and Nyando River at a scale of 1:500 and at a scale of 1:20000? [6 marks]

**QUESTION 5: (GEO-VISUALIZATION)**

[20 marks]

1. What is meant by the term "Geo-visualization"? [3 marks]
2. Define the term map and give three types of maps [6 marks]
3. State three basic elements of a map [3 marks]
4. Explain four (4) essential items of marginal information that a good map should comprise in addition to the mapped area (map image). [8 marks]

**QUESTION 6 (GIS APPLICATION)**

[20 marks]

1. Citing relevant examples, discuss five ways GIS can be applied. [20 marks]