



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2015/2016

**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE
DEGREE OF BACHELOR OF ARTS WITH INFORMATION
TECHNOLOGY**

CITY CAMPUS

PGS 222: SPATIAL STATISTICS AND GEOSPATIAL ANALYSIS

Date: 20th April, 2016

Time: 9.00 - 11.00am

INSTRUCTIONS:

- **Answer Question ONE and any other TWO Questions.**



QUESTION: 1

- a. Briefly explain the following:
 1. Spatial statistics (2 marks)
 2. Geospatial analysis (2 marks)
 3. Lattice data(2 marks)
 4. Spatial point patterns(2 marks)
 5. Stationarity (2 marks)
- b. Outline the key Objectives of Spatial Statistics in the contemporary world. (6 marks)
- c. Define the main applications of spatial statistics and geospatial analysis in Kenya. (4 marks)
- d. Explain the sources of spatial statistics data (5 marks)
- e. Differentiate between Kriging and Stochastic simulation (5 marks)

QUESTION: 2

- a. Briefly describe Kriging approach (5 marks)
- b. Explain the advantages of Kriging (3 marks)
- c. Differentiate the following models: (6 marks)
 1. Ordinary Cokriging
 2. Universal Cokriging
- d. Explain the major applications of Kriging in Kenya (6 marks)

QUESTION: 3

- a. In the context of spatial structure, explain the following:
 1. Large-scale structure (5 marks)
 2. Small-scale structure (5 marks)
- b. Using diagrams explain the following applications
 1. Directional distribution (standard deviational ellipse) (6 marks)
 2. Linear directional mean (4 marks)

QUESTION: 4

- a. Outline the main functions of the following tools:
 1. Median center(3 marks)
 2. Mean center(3 marks)
 3. Spatial Autocorrelation (3 marks)
 4. Average nearest neighbor(3 marks)
 5. Standard distance(3 marks)
- b. Giving examples explain the key applications of geospatial analysis (5 marks)

QUESTION: 5

- a. Briefly define semivariogram analysis in the context of spatial correlation (5 marks)
- b. Using a diagram explain characteristics of semivariogram (10 marks)
- c. Outline the advantages of using semivariogram analysis. (5 marks)

QUESTION: 6

- a. Differentiate the following models: (*Use a diagram where possible*) (15 marks)
 1. Exponential
 2. Gaussian
 3. Spherical
- b. Briefly explain Stochastic simulation in the context of geospatial analysis (5 marks)