



**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**SECOND YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DEGREE**

**OF**

**BACHELLOR OF SCIENCE IN GEOSPATIAL INFORMATION  
SCIENCE (GIS)**

**COURSE CODE: DPG 206**

**COURSE TITLE: SPATIAL STATISTICS**

**DATE: 22/04/2022**

**TIME: 8 - 10AM**

---

**INSTRUCTIONS TO CANDIDATES**

Answer Question 1(ONE) and any other TWO Questions

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

**Question ONE**

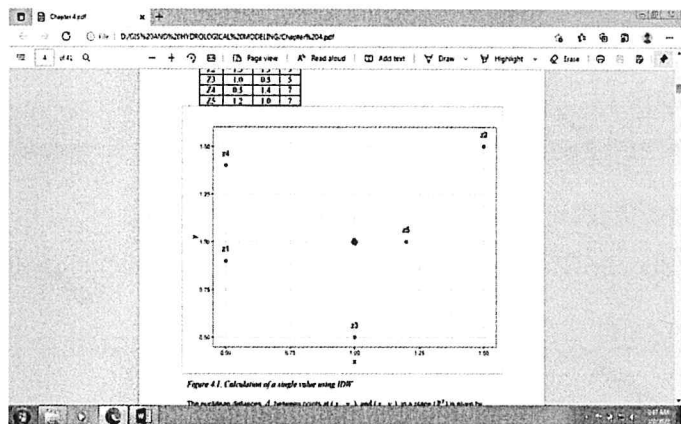
- a) Define the following terms as applied in spatial statistics: **[2 Marks each]**
  - i) Geostatistics
  - ii) Interpolation
  - iii) Prediction
  - iv) Deterministic interpolation
  - v) Stochastic interpolation
  - vi) Autocorrelation.
- b) What are spatial statistics in a GIS environment? **[5 Marks]**
- c) Spatial statistics is very critical when analyzing spatial data. Discuss. **[5 Marks]**
- d) Briefly describe steps of identifying clusters using statistics. **[5 Marks]**
- e) Explain the difference between global and local interpolation methods. **[3 Marks]**

**Question TWO**

- a) With the help of a diagram, discuss the Inverse Distance Weights (IDW) method. **(4 Marks)**

- b) Given in Figure 1 are five points,  $z_1, z_2, z_3, z_4, z_5$  and one point  $z_0$ , which we want to predict. The planar coordinates of each point are given in the columns x and y, and the actual value associated with each point is given in column z.

Point	x	y	z
$z_0$	1.0	1.0	?
$z_1$	0.5	0.9	1
$z_2$	1.5	1.5	3
$z_3$	1.0	0.5	5



$z_4$	0.5	1.5	7
$z_5$	1.2	1.0	7

---

Compute  $z_0$  using Inverse Distance Weights (IDW) **[16 Marks]**

### Question THREE

- Differentiate between spatial correlation and spatial autocorrelation. **[2 Marks]**
- What is the difference between spatial statistics and spatial analysis? **[2 Marks]**
- Explain the difference between global and interpolation methods. **[6 Marks]**
- What is the purpose of fitting a semivariogram with a mathematical model? **[5 Marks]**
- How does Kriging differ from the Inverse Distance Weights (IDW) method? **[5 Marks]**

### Question FOUR

Geographic Relationships is one of the topics in spatial statistics. Discuss the process of determining geographic relationships. **[20 Marks]**

