

NATIONAL UNIVERSITY OF LESOTHO
B.A, B.A URP & B.Sc. SUPPLEMENTARY EXAMINATIONS
ES 4411/GES 4575: SPATIAL ANALYSIS & DATA MODELING/GIS FOR PLANNERS

August 2023

MARKS: 100

TIME: 3 HOURS

Instruction: Answer any four questions. Where appropriate illustrate your answers with sketches or diagrams.

Question 1

With the aid of a diagrams or equations, briefly discuss the following methods of measuring distance

- a) Proximity distance (10)
 - b) Manhattan distance (10)
 - c) Euclidean distance (5)
- [25]

Question 2

- a) Thoroughly, discuss the Inverse Distance Weighting (IDW) method and present (15)
 - b) Briefly discuss one practical application of IDW method in Lesotho (10)
- [25]

Question 3

Discuss all methods of spatial analysis that fall under transformations and present one practical application of each method mentioned (25)

Question 4

- a) Thoroughly, discuss all the query methods available in GIS (20)
 - b) Outline the importance of conducting queries in GIS (5)
- [25]

Question 5

The ReNoka project has embarked on a process of protecting wetlands in the highlands of Lesotho from overgrazing. You have been assigned the task of mapping the wetlands and monitoring their condition on a six-month basis to determine the success of the intervention efforts. You have been appointed as a GIS specialist for this project, as a result:

- a) Discuss, with reasons, the best methods of data capture that you would use to represent the following datasets into the GIS; wetlands, streams, grazing areas, rock outcrops, cattle post areas and bare soil spots (15)
 - b) Discuss the type of analysis that you would undertake to determine the conditions of the wetlands on a six months basis (5)
 - c) Reasons for selecting this type of analysis in (b) above (5)
- [25]

Question 6

- a) Discuss all the necessary steps required to generate a Digital Elevation Model (DEM) from the digitisation process (15)
 - b) Discuss any two types of spatial analysis that can be performed on a DEM (10)
- [25]