

**UNIVERSITY OF ESWATINI**  
**DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND**  
**PLANNING**

**RE-SIT EXAMINATION, JULY 2019**

**B.A, BSc, BASS, B.Ed.**

**TITLE OF PAPER: INTRODUCTION TO GEOGRAPHICAL  
INFORMATION SYSTEMS**

**COURSE NUMBER: GEP221**

**TIME ALLOWED: THREE (3) HOURS**

**INSTRUCTIONS:**

- 1. ANSWER THREE QUESTIONS**
- 2. QUESTION 1 IS COMPULSORY**
- 3. ILLUSTRATE YOUR ANSWERS WITH  
EXAMPLES AND CLEARLY DRAWN DIAGRAMS  
WHERE APPROPRIATE**

**ALLOCATION OF MARKS: QUESTION 1 (COMPULSORY) CARRIES  
40 MARKS WHILE THE REST CARRY  
30 MARKS EACH**

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS  
GRANTED BY THE INVIGILATOR**

**GEP221: INTRODUCTION TO GEOGRAPHICAL INFORMATION SYSTEMS –  
JULY 2019**

**SECTION A: COMPULSORY**

**QUESTION 1**

The Ministry of Agriculture and Cooperatives is interested in studying the coverage and changes in *cultivated land* of the Middleveld in Eswatini for the past 50 years. As a GIS officer in the Ministry, you have been tasked with undertaking the analysis, and producing the change map for cultivated areas in the region. The following are available datasets you are to use for the task:

- A shapefile of the four physiographic regions of the country projected to WGS84
  - A land use raster map for the year 1969 projected to LO31+
  - A land use raster map for the year 2019 projected to LO31+
- a) Fully outline, using examples and illustrations where appropriate, the steps you would undertake, and the GIS operations you would perform to undertake the analysis, in order to produce a map showing changes in cultivated land in the Middleveld. (35 marks)
- b) Briefly explain how you would aid the Ministry make sense of the product so as to understand change in cultivated land in the region. (5 marks)

**(40 Marks)**

**SECTION B: ANSWER ANY TWO QUESTIONS**

**QUESTION 2**

- a) Define attribute data and spatial data, differentiating between the two. (15 marks)
- b) Using examples, differentiate between attribute data query and spatial data query, and explain when each query type is best to use. (15 marks)

**(30 Marks)**

**QUESTION 3**

With reference to a problem of your choice, discuss how GIS has been useful in solving a spatial analysis problem.

**(30 Marks)**

**QUESTION 4**

- a) Define a Geographical Information System. (5 marks)

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b) Discuss the functions of a GIS, showing how GIS is unique over other systems.

(25 marks)

**(30 Marks)**

**QUESTION 5**

Using examples, identify and discuss five main questions a GIS can answer.

**(30 Marks)**