

UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING
FINAL EXAMINATION, MAY 2017
B.A, BSc, BASS, B.Ed.

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

COURSE NUMBER: GEP 221

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**

**GEP 221: INTRODUCTION TO GEOGRAPHICAL INFORMATION SYSTEMS –
MAY 2017**

SECTION A: COMPULSORY

QUESTION 1

A client with 20 farms around Swaziland is looking at setting up a game reserve in one of these farms. Their plan is that the game reserve should also have a lodge for accommodation, a casino and a golf course. You are a GIS expert, and the client has asked you to complete a GIS-based spatial analysis project. The task is to assist with the GIS-based selection of the suitable farm, and the spatial planning for the new game reserve and lodge site development at the farm.

Being a new project, the client does not have any existing spatial data. Information they pass to you is the farm numbers for you to retrieve the farms from topographic maps. But the client understands that there will be a need to capture some data for you to be able to perform your analysis. You need to guide them on the kind of data you will need to perform the spatial analysis.

With the above in mind;

- a) Discuss how you would complete this analytical task. (20 marks)
 - b) Provide a description of spatial datasets you would need to complete the task, noting the data source, whether the data is freely available, or it needs to be bought, or whether it needs to be created. (10 marks)
 - c) Discuss how each dataset will be used to assist in the selection of the site, and the establishment of the new development. (10 marks)
- (40 Marks)**

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 2

With the aid of a diagram, discuss the different components of a GIS, highlighting how the failure of *each* of the components affects the system.

(30 Marks)

QUESTION 3

- a) What is the function of the 'Buffer Tool' in a GIS? (2 marks)
- b) Discuss an example of how you might make use of the 'Buffer Tool' if you were given a set of rivers (as polylines) and natural forests (as polygons). (6 marks)
- c) With the aid of diagrams, explain the difference between the 'Intersect Tool' and the 'Clip Tool' in ArcGIS. (7 marks)
- d) 'A shapefile must have, as a minimum, at least three file types'. List the composite files of a shapefile, and describe the role of each file. (15 marks)

(30 Marks)

QUESTION 4

- a) Draw the three principle vector data representations, and briefly describe the characteristics of each. (10 marks)
 - b) Discuss the different sources of GIS vector data. (20 marks)
- (30 Marks)**

QUESTION 5

An old 1950 paper map of Matsapha has been passed to you. Explain how you would transform the paper map into GIS data, whereby each land feature type is a layer/shapefile.

(30 Marks)