DEPARTMENT OF GEOGRAPHY, GEOINFORMATICS & METEOROLOGY
FACULTY OF SCIENCE
GGY221 INTRODUCTORY GIS
SECOND OPEN BOOK CLASS TEST

11 October 2010   TIME: 40 min

1. DATA ACQUISITION

1.1 Name the steps in the data stream that you will follow if:

a.   **You need to capture new boreholes in a specific area**. *Coordinate Surveying/GPS, Electronic Data Transfer, (Projection Change)*

b.   **You want to add an aerial photograph as a backdrop to the boreholes but the image does not fit on the vector data**
Aerial Photographs, Electronic data transfer (or Scanning) Rubber sheeting.

c.   **You have obtained some data sets as raster data but you want to display your final result as vector layers.**
Digital Data, Electronic Data Transfer, Raster-vector Conversion

(8)

1.2 The following research question and criteria are given to you:
Research question: Where is the best route for the new railway line?
The best route for the new railway line is where the following conditions apply:
a.   It must pass through the Industrial and Business area.
b.   It must be further than 5km from the Residential area.
c.   The underlying geology type must not be dolomite.
d.   It should not be closer than 5 km from any indigenous forest.
e.   The total cost of the properties that will be affected should not exceed more than R100 million.

The following data sets are needed for the project:

Spatial data	Attribute Data
Properties	Land Use Type Property Values Unique Identifier
Geology	Geology types
Vegetation	Unique Identifier Vegetation types

Give possible sources and encoding methods that may be used to capture each data set in a GIS. You are not allowed to use a possible source or encoding method more than two times.

More than one possible answer!:

(9)

Spatial data	Attribute Data	Data Source	Encoding Method
Properties	Land Use Type Property Values Unique Identifier	Aerial Photograph Digital Data	Scanning and Digitising Electronic Data Transfer
Geology	Geology types	Maps	Digitising
Vegetation	Unique Identifier	Satellite Images	Electronic data

	Vegetation types		transfer and Digitising

2. **Data Analysis**

1.2 Based on the information given in question 1.2 explain the analysis method (s) that you will use to analyse each of the criteria using a GIS.

1 It must pass through the Industrial and Business area.
Attribute Query to find all Business and Industrial properties

2 It must be further than 5km from the Residential area.
Attribute Query to find all Residential areas. Buffer of 5km around residential areas (or Spatial Query)

3 The underlying geology type must not be dolomite.
Attribute Query to find all dolomite areas (Switch selection)

4 It should not be closer than 5 km from any indigenous forest.
Attribute query to find all indigenous forests. Buffer of 5 km around indigenous forests (or spatial selection)

5 The total cost of the properties that will be affected should not exceed more than R100 million.
Spatial selection to find all properties that will be affected. Attribute query to work out total cost.

(13

TOTAL [30]