



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

DEPARTMENT OF LAND AND SPATIAL SCIENCES

QUALIFICATIONS: BACHELOR OF NATURAL RESOURCE MANAGEMENT, BACHELOR OF NATURAL RESOURCE MANAGEMENT IN NATURE CONSERVATION	
QUALIFICATION CODES: 07BNRS, 07BNTC	LEVEL: 5
COURSE CODE: GES512S	COURSE NAME: GEOGRAPHIC INFORMATION SYSTEMS 1
SESSION: JULY 2024	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
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MODERATOR:	Mr Erich Naoseb

INSTRUCTIONS
<ol style="list-style-type: none">1. Write your student number on each answer sheet used.2. Answer ALL the questions.3. Read each question carefully before attempting to answer.4. Write clearly and neatly.

PERMISSIBLE MATERIALS
<ol style="list-style-type: none">1. Pen.2. Pencil.3. Eraser4. Ruler.

This paper consists of six (6) pages (including this cover page).

Question 1

Answer the multiple choice questions listed below. Please select the one (1) most relevant response to the following questions. Indicate the correct answer on the answer sheet.

- 1.1. GIS represents Y-coordinates in a _____ direction. (1)
- A. Tangentially
 - B. Vertical
 - C. Horizontal
 - D. Positional
- 1.2. Examples of discrete fields are. (1)
- A. Air temperature
 - B. Barometric pressure
 - C. Soil salinity
 - D. Land classification
- 1.3. Which type of map projection is best suited for use as regional or hemispheric maps, but rarely for a complete world map? (1)
- A. Equivalent Map Projection
 - B. Cylindrical Map Projection
 - C. Conical Map Projection
 - D. Azimuthal Map Projection
- 1.4. What is the most essential component of a GIS? (1)
- A. Graphical Representation
 - B. Information Database
 - C. Software
 - D. Satellite

- 1.5. What is the other name for a geographic coordinate system? (1)
- A. Rectangular Coordinate System
 - B. Spherical Grid System
 - C. Latitude and Longitude System
 - D. Parallel Coordinate System

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Question 2

Which of the following GIS-related statements are true or false? On the answer sheet, indicate True or False. Provide the correct answer if false.

- 2.1. The location of any point on the earth's surface about a rectangular coordinate system is generally termed a relative position. (2)
- 2.2. Data can be shared in the process of GIS. (2)
- 2.3. GIS has no significant role in disaster management and emergency response activities. (2)
- 2.4. If the number on scale is less then it represents a large scale map. (2)
- 2.5. Mapmakers use GIS to view geographic information. (2)

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Question 3

- 3.1. Explain hardware and people as components of GIS. (4)
- 3.2. Geographic phenomena can be categorised in two (2) forms; explain the two (2) types of a geographic phenomenon and provide two (2) examples of each. (6)

- 3.3. How does GIS software (e.g., ArcGIS for Desktop) differ from Google Maps? (4)
- 3.4. List five (5) advantages of using a GIS instead of traditional paper maps and manual analysis. (5)
- 3.5. Geographical Information System (GIS) can work with spatial and non-spatial data. Name three (3) ways in which data input in a geographical Information system can be broken down. (3)
- 3.6. A GIS can answer five (5) types of questions. Study Figure 1, name four (4) of the five (5) questions and explain how GIS can be used to answer those questions based on Figure 1. (8)

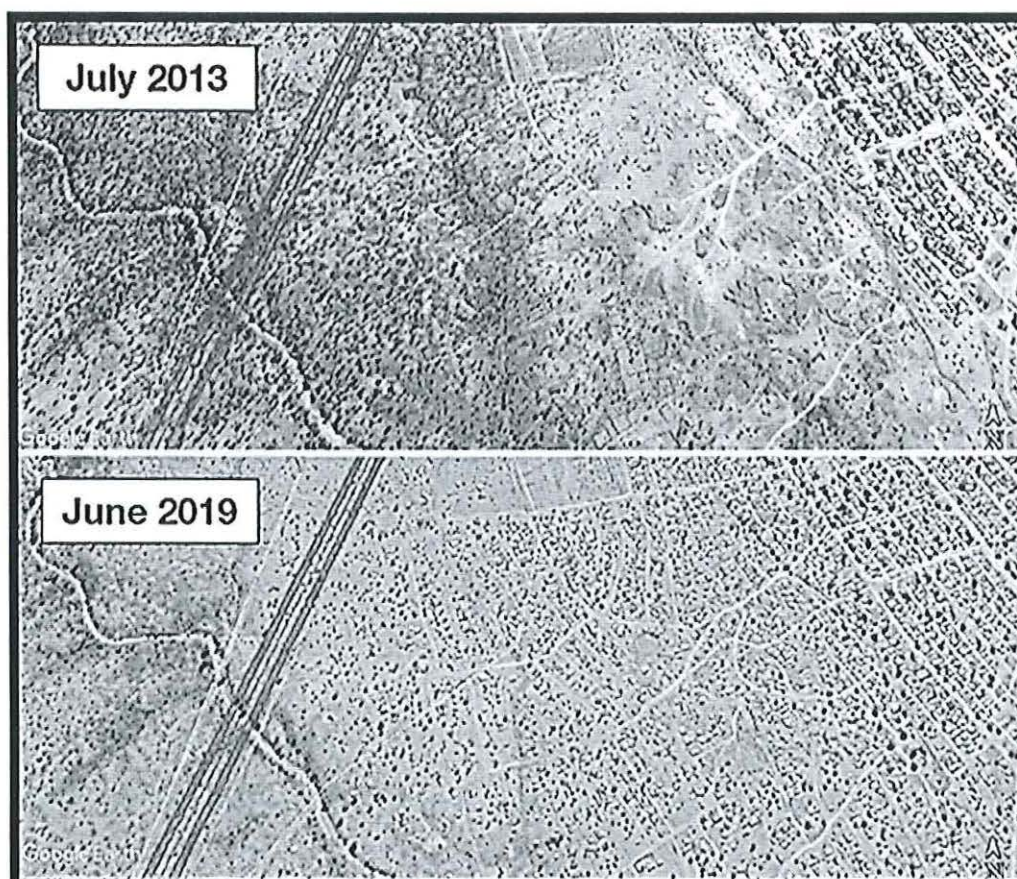


Figure 1: Before (2013) and After (2019). The satellite images show the area now known as Vergenoeg Informal Settlement on the outskirts of Okahandja. The image on top was captured in 2013 when the design for the Windhoek Okahandja dual carriageway was done. The other image was captured in 2019.

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Question 4

- 4.1. Define the following terms.
- a) Geoid (2)
 - b) Ellipsoid (2)
 - c) Map projection (2)
- 4.2. What projection properties does a Mercator projection preserve? (2)
- 4.3. What is the difference between a secant and a tangent projection? (2)
- 4.4. Define and describe the UTM Coordinate System. What type of developable surface is used for a UTM projection? (5)
- 4.5. Briefly explain how a UTM zone is defined in terms of its central meridian, standard meridian, and scale factor. (5)
- 4.6. Explain the concept of utilising counts and cell values within a raster data model. (5)

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Question 5

- 5.1. Outline four (4) of the problems of paper map digitisation. (4)
- 5.2. Identify the type of connectivity analysis in Figure 2. Provide five (5) possible application examples for this type of analysis. (6)

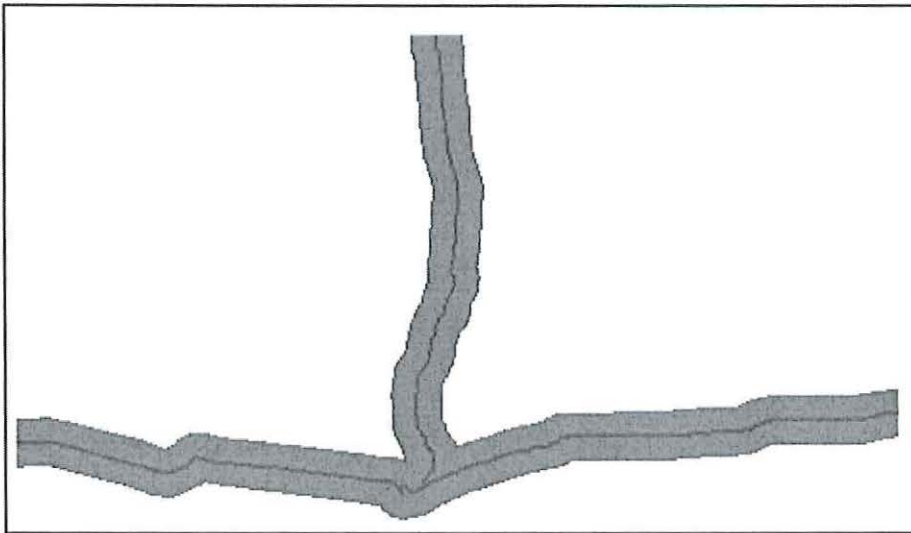


Figure 2

- 5.3. Which two (2) GIS data selection methods can be used in ArcMap? List these methods and provide a brief description of each. (4)
- 5.4. Explain the difference between thematic rasters and image rasters. (4)
- 5.5. List and describe the three (3) different types of thematic maps. Give two (2) examples of each, as well as the data type that was used to display the data. (12)

[30]