NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

DEPARTMENT OF LAND AND SPATIAL SCIENCES

QUALIFICATIONS: BACHELOR OF NATURAL RESOURCE MANAGEMENT IN NATURE CONSERVATION BACHELOR OF NATURAL RESOURCE MANAGEMENT	
QUALIFICATION CODES: 07BNTC 07BNRS	**LEVEL:** Level 7 - 07BNTC, 07BNRS
COURSE CODE: GES512S	**COURSE NAME**: GEOGRAPHIC INFORMATION SYSTEMS 1
SESSION: JUNE 2025	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER:	Ms Roxanne Murangi
MODERATOR:	Mr Erich Naoseb

INSTRUCTIONS
1. Write your student number and programme code on the answer sheet. 2. Answer ALL the questions. 3. Read each question carefully before attempting to answer. 4. Write clearly and neatly.

PERMISSIBLE MATERIALS
1. Pen 2. Pencil 3. Eraser 4. Ruler

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

Question 1

Answer the multiple-choice questions listed below. Please select the ONE most relevant to the following questions. Indicate the correct answer on the answer sheet.

1.1. Data that describe the characteristics of spatial features. (1)

A. Attribute data
B. Ancillary data
C. Auxiliary data
D. Associative data

1.2. A systematic arrangement of parallels and meridians on a plane surface. (1)

A. Meridians
B. Equator
C. Surface
D. Map projection

1.3. What is the purpose of the "Select by Location" tool in GIS? (1)

A. To choose features based on their attribute values
B. To pick features based on their spatial relationship to other features
C. To select features randomly for sampling
D. To identify features with incomplete attribute data

1.4. The following are the major ways to represent the world or geographic phenomena in QGIS, except. (1)

A. Features (collection of lines, points, and polygons)
B. Attributes (associated features)
C. Spreadsheet without coordinates attached to the data
D. Remotely sensed data or imagery

1.5. Which of the following are examples of common map elements? (1)

A. Label, variables, and symbols
B. Database, theme, distortion lines
C. Inset, scale, frame, and legend
D. Points, lines, and polygons

[5]

Question 2

2.1. In your own words, briefly discuss what GIS is. List the three (3) major components of a GIS. (7)

2.2. Briefly describe what Geospatial data is. Provide any three (3) examples of geospatial data. (4)

2.3. A GIS has four (4) functions. Briefly discuss any two functions and provide two examples for each. (4)

2.4. A city intends to build a new hospital. How can GIS assist them in selecting the ideal location? Provide at least five (4) spatial datasets that will be used to determine the optimal site for the new hospital. (4)

2.5. Identify the labelled parts of Figure 1 extracted from ArcCatalog below and briefly explain the purpose of the parts identified. (6)

Figure 1

[25]

Question 3

3.1. Briefly describe what a coordinate system is. Provide three (3) uses of a coordinate system. (4)

3.2. Describe what a Geographic coordinate system is. List at least three (3) properties. (4)

3.3. Suppose the Earth were flat. Would you still need map projections? Motivate your answer. (4)

3.4. Outline the differences between georeferencing and geocoding. (4)

3.5. What are conformal projections, and how do they maintain shape over varied area sizes? Give two (2) examples and two (2) applications of a conformal projection. (7)

3.6. Define what the UTM projection system is. Outline four (4) properties of a UTM and explain how they avoid negative values. (7)

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Question 4

4.1. Briefly describe the difference between thematic rasters and image rasters. (4)

4.2. A wildlife conservation team is tasked with mapping and monitoring the migration patterns of endangered animals across Etosha National Park. They plan to use GIS to create detailed maps that show migration routes, the locations of watering holes, and protected areas to better manage the park's resources and improve conservation efforts.

a) What vector data collection methods would suit a wildlife conservation project? Provide at least one (1) example of the vector data types (points, lines, or polygons) that could be collected using each method to support this conservation effort. (6)

4.3. Name and briefly describe any three (3) functions you can perform to understand the data characteristics in GIS. (6)

4.4. Describe how the raster data model represents GIS data. (4)

[20]

Question 5

5.1. Outline and describe the three (3) concepts of attributes. (6)

5.2. Explain the Selection by Location Query works. List three (3) possible options that you can use in a Selection by Location Query. (4)

5.3. What do the main classification decisions refer to during the map production? (3)

5.4. Write a valid SQL expression to select "Cities" with people between 1800 and 3000 using a field called POP2000 from the Citizens layer. (3)

5.5. Indicate what each of the following terms are used to represent:

a) Contours (1)

b) Isotherms (1)

c) Isobaths (1)

d) Isochrones (1)

[20]