NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

## FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

### DEPARTMENT OF LAND AND SPATIAL SCIENCES

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| **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:** JUNE 2024 | **PAPER:** THEORY |
| **DURATION:** 3 HOURS | **MARKS:** 100 |

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

| INSTRUCTIONS |
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| 1. Write your student number on each answer sheet used.<br>2. Answer ALL the questions.<br>3. Read each question carefully before attempting to answer.<br>4. Write clearly and neatly. |

| PERMISSIBLE MATERIALS |
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| 1. Pen.<br>2. Pencil.<br>3. Eraser.<br>4. 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 a location in _____ dimensional coordinates. (1)

A. 2
B. 3
C. 4
D. 5

1.2. What are the two factors used to categorize all maps? (1)

A. Political Boundaries and Color
B. Climate and Temperature
C. Size and Theme
D. Scale and Contents

1.3. What is the function of geoprocessing? (1)

A. Manipulates global data
B. Manipulates spatial data
C. Manipulates local data
D. Manipulates special data

1.4. The scientist Roger Tomlinson created _____ for analysing and storing a large amount of data. (1)

A. Database
B. SD card
C. Pen drive
D. Computer

1.5. What function is performed by the data input/capture subsystem of GIS? (1)

A. Transformation of Data
B. Storage of Data Elements
C. Retrieval of Data Elements
D. Acquiring Data

**[5]**

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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. Satellite imagery cannot be integrated into GIS systems for analysis and mapping purposes. (2)

2.2. Google Maps is an example of a GIS software. (2)

2.3. GIS can only work with data in the form of maps and cannot handle tabular data. (2)

2.4. All layers to be used together in a GIS operation must align spatially. (2)

2.5. GIS is primarily used for mapping physical features of the Earth's surface and cannot represent abstract data. (2)

**[10]**

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**Question 3**

3.1. How does data become information? (3)

3.2. Provide one definition of what a GIS is. (4)

3.3. Differentiate between GIS and IS, providing examples of each. (4)

3.4. What are the three (3) Geographical Information Technologies? (3)

3.5. What are the functions of a GIS? List them and provide one (1) example for each function. (8)

3.6. Explain the term Geographic Phenomena. Provide three (3) examples of Geographic Phenomena. (4)

3.7. Imagine a tree. How would you keep track of and communicate information about this tree to other people who need to know all about it? In your explanation provide at least six (6) non-spatial attributes that are considered important to describe this tree. (4)

**[30]**

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**Question 4**

4.1. Provide a brief explanation of the term location. (2)

4.2. What is the purpose of a coordinate system in GIS? (2)

4.3. List three (3) characteristics that make a coordinate system. Provide one (1) example for each. (3)

4.4. Identify the types of coordinate systems in Figure 1. List at least four (4) characteristics for each coordinate system. (10)

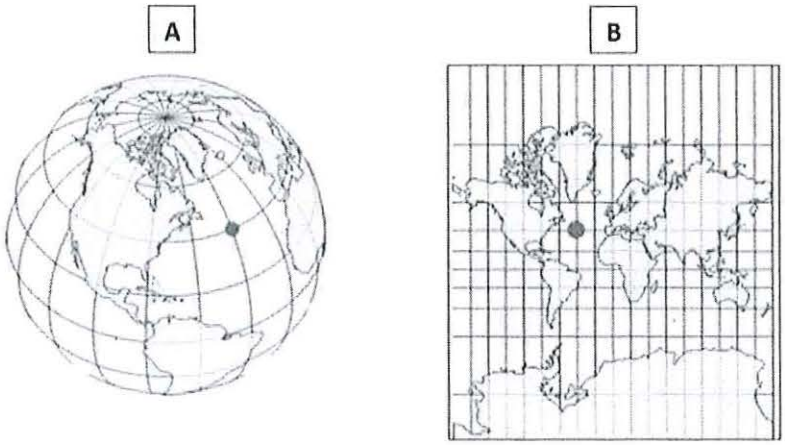


Figure 1

4.5. List the three (3) categories of map projection with their respective distortion properties. Provide one (1) example of each. (6)

4.6. Explain the term datum in the context of coordinate systems. (2)

4.7. Define and describe the UTM Coordinate System. What type of developable surface is used for a UTM projection? (5)

**[30]**

**Question 5**

5.1. Which of the data models relate to picture elements? Outline some of its characteristics. (4)

5.2. Identify the type of vector-based overlays in Figure 2. Briefly explain each overlay. (6)

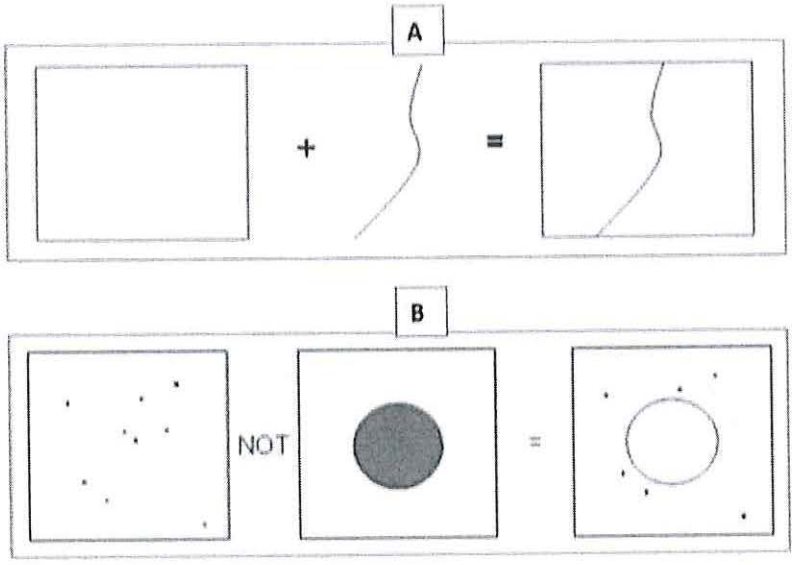


Figure 2

5.3. GIS queries can be performed in several ways, including by location. Outline any three (3) applications to this method of selection. (6)

5.4. Data accuracy is a statement of how closely a bit of data represents the real world. It involves five (5) statements. List them. (5)

5.5. Outline the difference between thematic and topographic maps. (4)

**[25]**