NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF NATURAL RESOURCES AND SPATIAL SCIENCES

DEPARTMENT OF GEO-SPATIAL SCIENCES AND TECHNOLOGY

QUALIFICATION: DIPLOMA IN GEOMATICS, DIPLOMA IN LAND ADMINISTRATION, DIPLOMA IN PROPERTY STUDIES, BACHELOR OF GEOMATICS, BACHELOR OF GEOINFORMATION TECHNOLOGY, BACHELOR OF TOWN AND REGIONAL PLANNING, BACHELOR OF REGIONAL & RURAL DEVELOPMENT, BACHELOR OF LAND ADMINISTRATION, BACHELOR OF PROPERTY STUDIES	
QUALIFICATION CODE: 06DGEM, 06DLAD, 06DPRS, 07BGEM, 07GITB, 07BTAR, 07BRAR, 07BLAD	**LEVEL:** 5
COURSE CODE: GES512S	**COURSE NAME:** GEOGRAPHIC INFORMATION SYSTEMS 1
SESSION: JANUARY 2020	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

2nd OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER	**Mr. Erich Naoseb**
MODERATOR:	**Mr. Miguel Vallejo**

INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly.

PERMISSIBLE MATERIALS

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1. Examination paper.
2. Examination script.
3. Calculator, ruler, pencil, eraser.

THIS QUESTION PAPER CONSISTS OF 6 PAGES (Including this front page)

Question 1 Complete the missing words in the below statements

1.1 The secant case means that a cylindrical projection has _____ line(s) of tangency. (1)

1.2. Each UTM zone covers _____ degrees in longitude (1)

1.3. The central meridian of a UTM zone has a scale factor of _____ (1)

1.4. False Easting applies to _____ coordinate. (1)

1.5. Global Positioning Systems (GPS) readings are based on the_____ datum. (1)

1.6. Vector data are better suited for representing _____ features and raster data are better suited for representing _____ features. (2)

1.7. The _____ is the reference system for locating spatial features on the Earth's surface. (1)

1.8. A _____transforms the geographic coordinates on an ellipsoid into locations on a plane. (1)

1.9. A _____refers to the line of tangency between the projection surface and the reference globe. (1)

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Question 2

2.1. Provide a brief explanation of the terms below.

a) False easting: (1)

b) False northing: (1)

c) Latitude: (1)

d) Longitude: (1)

e) Projected coordinate system: (1)

f) Projection: (1)

g) Union: (1)

h) Equivalent projection: (1)

i) Ellipsoid: (1)

j) Map: (1)

2.2. How does a GIS software (e.g., ArcGIS for Desktop) differ from Google Maps? (4)

2.3. A Geographical Information System (GIS) can work with spatial and non-spatial data. Name three ways in which data input in a geographical Information system can be broken down. (3)

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Question 3

3.1. A GIS can answer 5 type of questions. Study **Figure 1** below, name four of the five questions and explain how GIS can be used to answer those questions based on **Figure 1.** (8)

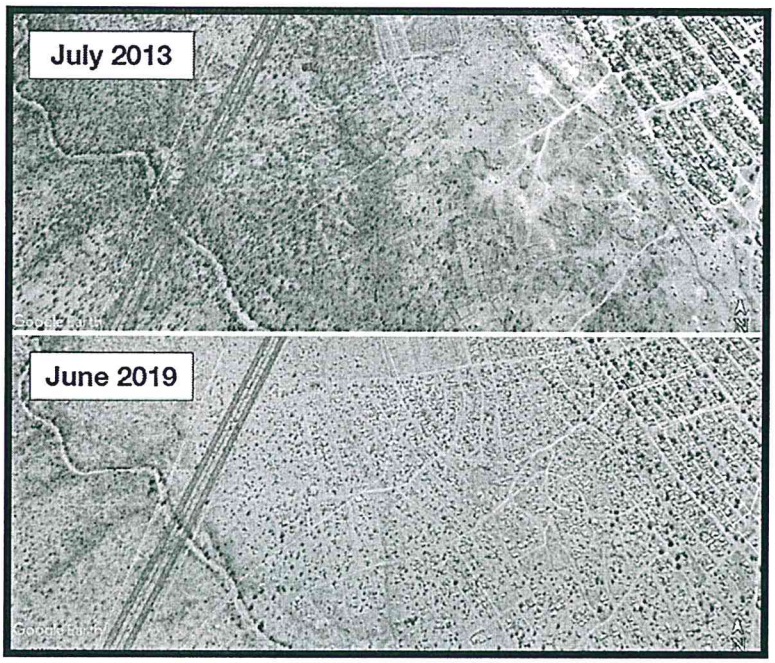

Figure 1: BEFORE AND AFTER. The satellite images show the area now known as Vergenoeg Informal Settlement on the outskirts of Okahandja. The image on top was captured in 2013 when the design for the Windhoek- Okahandja dual carriageway was done. The other image was captured in 2019.

3.2. What are the three important characteristics that map projections should attempt to keep? (3)

3.3. Explain the difference between thematic rasters and image rasters. (4)

3.4. Explain what vector overlay is and list three common vector overlay methods. (4)

3.5. Suppose you want to select only the point features that are found within the circle in **Figure 2**. Explain how you will achieve that using GIS analytical tools. (4)

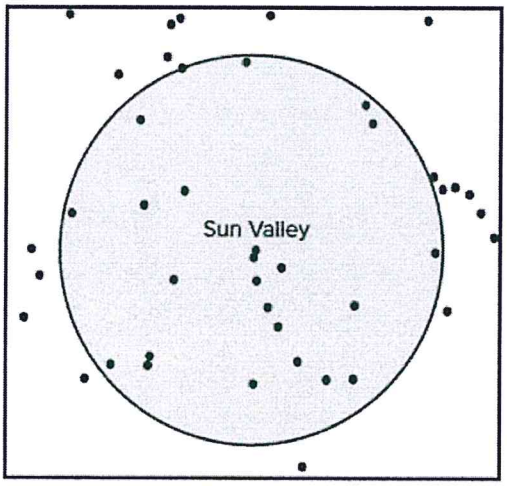

Figure 2

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Question 4

4.1. Data plays an important role in any information system. Name and explain the three important stages of working with geographical data. (6)

4.2. Name and briefly explain any two functions you can perform to understand the data characteristics in GIS. (4)

4.3. A system analyst performs an important function in an enterprise. Name the three (3)

modelling techniques that a system analyst can use to organize information in an enterprise.

4.4. Explain the raster data model as a means of representing GIS data. (3)

4.5. Describe the three types of map projections by the distortion properties. (6)

4.6. Briefly explain what a Geographic coordinate system is. (3)

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Question 5

5.1. You are provided the attribute table of the *BDR_regional_boundaries_2013_II* layer to create a map using the REGION_NAM field. What type of a map will you create? Motivate your answer (2)

Table

BDR_regional_boundaries_2013_II

FID	Shape *	REGION_NAM	REGION_COD	COUNT	AREA	GAVPrimary	ID	Shape_Leng	Shape_Area
0	Polygon	Zambezi	01	6	14480.3	1	1	947768.615493	14663147414
1	Polygon	Erongo	02	7	63579.9	2	2	1377214.21136	63639275627.900002
2	Polygon	Hardap	03	6	109617.7	3	3	2082108.17099	109704137187
3	Polygon	Karas	04	6	161274.7	4	4	2235979.96052	161394841967
4	Polygon	Kavango West	05	9	48455.2	5	5	783604.132895	24591330459.099998
5	Polygon	Khomas	06	10	36943.7	6	6	1490267.52906	36949886022.900002
6	Polygon	Kunene	07	6	115273.9	7	7	1911108.97186	115615667493
7	Polygon	Ohangwena	08	11	10703.2	8	8	597338.58523	10709145037.5
8	Polygon	Omaheke	09	7	84552.5	9	9	1519298.70983	84741796399.699997
9	Polygon	Omusati	10	12	26571.2	10	10	791129.990195	26600301556
10	Polygon	Oshana	11	10	8652.4	11	11	588262.568747	8656280634.110001
11	Polygon	Oshikoto	12	10	38668.3	12	12	994722.279739	38673072976.199997
12	Polygon	Otjozondjupa	13	7	105203.2	13	13	2111615.36127	105295121824
13	Polygon	Kavango East	05	9	48455.2	5	5	1001269.02653	23988637922.799999

1 (0 out of 14 Selected)

BDR_regional_boundaries_2013_II

Figure 3

5.2. Name any five (5) essential map elements you will insert in your map. (5)

5.3. Map scales can be represented in three forms. List these map scale forms with examples. (6)

5.4. Name the two questions that the map created in Question 5.1 will help to answer. (2)

5.5. Describe the three concepts of attributes using the information in **Figure 3**. (6)

5.6. Indicate what each of the below terms are used to represent. (4)

a) Contours

b) Isotherms

c) Isobaths

d) Isochrones

[25]