



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

DEPARTMENT OF LAND AND SPATIAL SCIENCES

QUALIFICATION: BACHELOR OF NATURAL RESOURCE MANAGEMENT, BACHELOR OF NATURAL RESOURCE MANAGEMENT IN NATURE CONSERVATION, ADMINISTRATION, BACHELOR OF LAND ADMINISTRATION, BACHELOR OF TOWN AND REGIONAL PLANNING, BACHELOR OF PROPERTY STUDIES, DIPLOMA IN PROPERTY STUDIES, BACHELOR OF REGIONAL & RURAL DEVELOPMENT	
QUALIFICATION CODE: 07BNRS, 07BNTC, 06DLAD, 07BLAM, 07BTAR, 06DPRS, 08BPRS, 07BRAR	LEVEL: 5
COURSE CODE: GES512S	COURSE NAME: GEOGRAPHIC INFORMATION SYSTEMS 1
DATE: JUNE 2023	SESSION: 1
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER:	MS ROXANNE MURANGI
MODERATOR:	MR MIGUEL VALLEJO

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

MATERIALS PERMISSIBLE
<ol style="list-style-type: none">1. Ruler2. Pen3. Pencil4. Eraser

This paper consists of four (4) pages (excluding this cover page)

Question 1

Define the following terms in the GIS context:

- 1.1. Geographic phenomena (2)
- 1.2. Datum (2)
- 1.3. Ellipsoid (2)
- 1.4. Map scale (2)
- 1.5. Attribute table (2)

[10]

Question 2

- 2.1. In your own words, discuss the term geographic information. Provide examples and applications in which each of the mentioned examples may be used. Provide at least five (5) examples. (6)
- 2.2. We study geographic phenomena because we want to gain a better understanding of our environment (geographic space) and events occurring there (de By 2004). In your own words, discuss what a GIS is. (3)
- 2.3. A GIS constitutes of five key components: hardware, software, data, people and methods and standards. Discuss the component data and three stages of working with GIS data. (8)
- 2.4. Describe how GIS software is different from other computer software. (4)

- 2.5. There are five types of questions that a sophisticated GIS can answer. Briefly discuss the questions what if (modelling)? and what is at? and provide one example for each question. (4)

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Question 3

- 3.1. Differentiate between a feature, feature class and feature dataset. (6)
- 3.2. Explain what a GIS layer is. Outline any five additional GIS principles. (6)
- 3.3. What is a horizontal datum? Provide two uses of a horizontal datum. (4)
- 3.4. Describe the UTM coordinate system. What type of developable surface is used for a UTM projection? (3)
- 3.5. What are the UTM zones, and where is the zone of origin? (3)
- 3.6. How are negative coordinates avoided in a UTM coordinate system? (3)
- 3.7. Identify the three projection aspects presented below in Figure 1. (3)

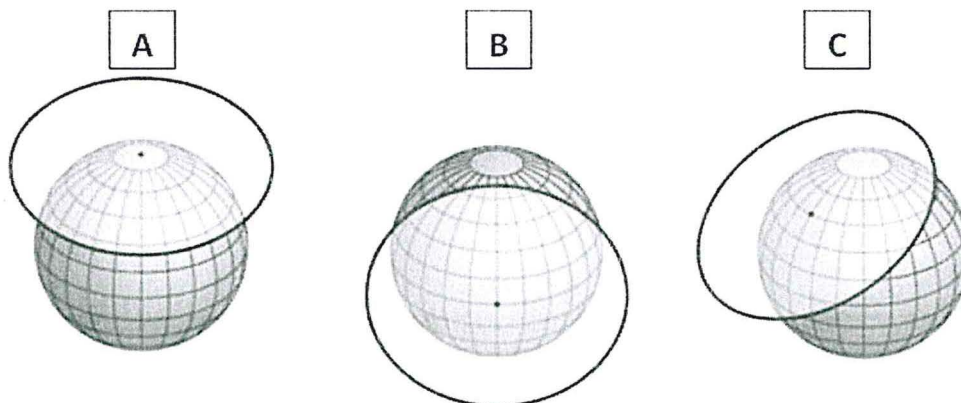


Figure 1

- 3.8. Explain what conformal projection is. Provide two useful applications of a conformal projection. (4)

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Question 4

- 4.1. A variety of methods exist for creating vector data including digitizing, GPS data collection, geocoding, and scanning. Briefly discuss the digitizing technique and outline two problems of paper map digitization. (4)
- 4.2. A raster data model uses a matrix of pixels or cells arranged in rows and columns to represent continuous phenomena. The accuracy of a raster depends on scale and resolution. Briefly explain the term resolution. (1)
- 4.3. List the three methods of raster data creation. (3)
- 4.4. State why elevation is considered a continuous phenomenon. (2)

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Question 5

5.1. Briefly explain the term spatial analysis. Provide four spatial analytical functions. (5)

5.2. Identify and briefly discuss the type of overlay function shown in Figure 2. (4)

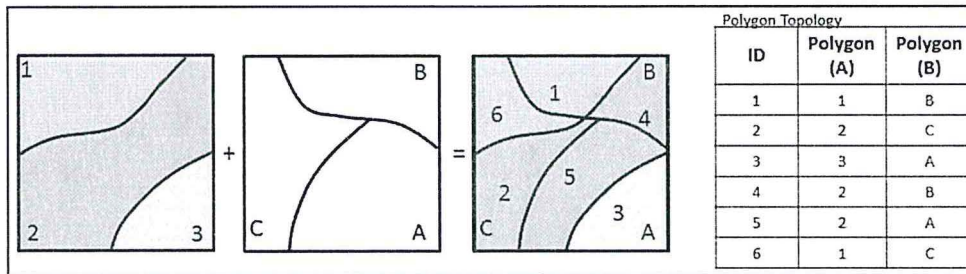


Figure 2

5.3. List the three concepts of attribute data. (4)

5.4. Figure 3 below shows the attribute table for the HLTH_pharmacies layer. Indicate the number of feature attributes contained in the HLTH_pharmacies layer. List the spatial and nonspatial attributes. (4)

HLTH_pharmacies							
FID	Shape *	NAME	STREETADDR	TEL	Y	X	
0	Point	AUAS VALLEY PHARMACY	AUAS VALLEY SHOPPING CENTRE	239241	8635.7	-64954.5	
1	Point	COMPION PHARMACY	GUSTAV VOIGTS CENTRE	229260	8728.69	-62937.8	
2	Point	CONTINENTAL PHARMACY	CONTINENTAL BLDG	235916	8767.53	-62364.5	
3	Point	ESTERIA PHARMACY	METJE BEHNSEN BLDG	237424	8707.6	-62361.16	
4	Point	INDEPENDENCE PHARMACY	INDEPENDENCE CENTRE	215011	5399.94	-57795.71	
5	Point	INTERNATIONAL PHARMACY	AI GAMS CENTRE	248195	10571.5	-63268.74	
6	Point	KLEIN WINDHOEK PHARMACY	341 SAM NUJOMA DRIVE	227323	10646.72	-63354.78	

Figure 3

5.5. Discuss what a map is. (1)

5.6. Briefly discuss what an isoline map is. Provide four types of isoline maps. (5)

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