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 (NATURE CONSERVATION), BACHELOR OF GEOINFORMATION TECHNOLOGY, BACHELOR OF LAND ADMINISTRATION, BACHELOR OF PROPERTY STUDIES HONOURS, BACHELOR OF REGIONAL AND RURAL DEVELOPMENT, BACHELOR OF URBAN AND REGIONAL PLANNING, DIPLOMA IN PROPERTY STUDIES	
QUALIFICATION CODE: 07BNRS, 07BGEI, 07BLAM, 08BOPS, 07BORR, 07BURP, 06DIPS	**LEVEL:** 4
COURSE: INTRODUCTION TO GEOSPATIAL DATA	**COURSE CODE:** IGD411S
SESSION: JULY 2024	**PAPER:** THEORY
DURATION: 2 HOURS	**MARKS:** 80

SECOND OPPORTUNITY / SUPPLEMENTARY EXAMINATION QUESTION PAPER

EXAMINER:	Ms D. Husselmann
MODERATOR:	Mr E. Naoseb

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

INSTRUCTIONS

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.
4. Answers to calculations must be rounded off to three decimal places, excluding answers to co-ordinate conversions

PERMISSIBLE MATERIALS

1. Examination paper.
2. Examination script.
3. Calculators and other drawing equipment.

Question 1

1.1.   What do the following acronyms stand for?   (5)

        a.   MSL

        b.   TIN

        c.   DTM

        d.   UTM

        e.   GPS

1.2.   State whether the following are true or false.   (5)

        a.   A thematic map show as much detail of the landscape, elevations, roads, towns etc. as possible.

        b.   Geospatial data is positional data collected about a geographic phenomenon.

        c.   Map generalisation is the process of amplifying the amount of details on a map.

        d.   Aerial photographs are also generalised or symbolised as maps.

        e.   At least four satellites are required to obtain a fixed GPS position.

1.3.   Fill in the missing word.   (5)

        a.   Data models enable complex ... features to be viewed in a simplified form that can easily be understood.

        b.   A line is a ..., it has both magnitude and direction.

        c.   A ... shows all the graphic symbols used to design the map.

        d.   ... photographs results when two photographs are taken from slightly different angles making them to appear three-dimensional when viewed together.

        e.   Dilution of Precision is a measure of the ... of satellite geometry and is related to the spacing and position of the satellites in the sky.

[15]

Question 2

2.1.   Which data model uses pixels to show location?   (1)

2.2.   Which datum enable us to: (2)

a. determine x and y positions and

b. determine height.

2.3.   What do we call the mathematical formulas that are used to convert the three-dimensional   (1)
earth to a two-dimensional flat surface?

2.4.   Give one word for: The pattern formed by the lines of latitude and longitude.   (1)

2.5.   Calculate the distance from 56.178° S to 30.294° S.   (3)

2.6.   Match each co-ordinate system with the correct co-ordinate format by writing down the co-   (3)
ordinate system and the format next to it.

CO-ORDINATE SYSTEM	CO-ORDINATE FORMAT
Polar	Y, X
Geographic	Direction, Distance
Projected	Latitude, longitude

[11]

Question 3

3.1.   Convert the following Degrees Minutes and Seconds to Decimal Degrees. Show your work.   (6)

a.   22° 28' 13" S

b.   23° 08' 15" E

3.2.   A Land parcel located in the Usakos area has the following co-ordinates: (8)
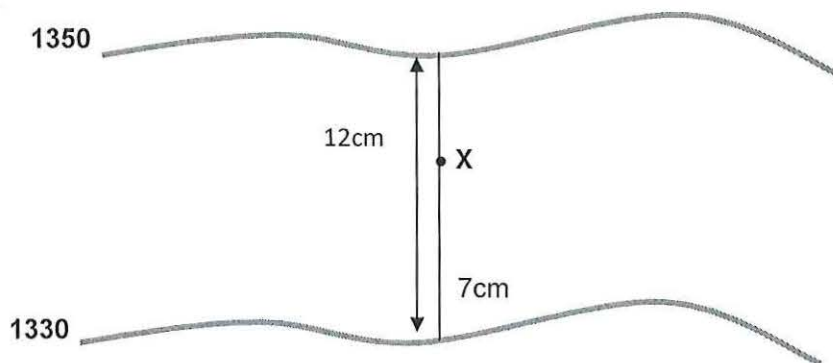
Point	Y	X
A	-10 697.20	+20 719.20
B	-13 742.20	+21 546.70
C	-14 050.60	+22 829.50
D	-11 581.50	+23 233.60

      i.   Calculate the area of the land parcel. Give your answer in hectares.

3.3.   Calculate the scale if the length of the Fish river is 7 cm on the map and 9 km in reality. Round   (4)
your scale off to the nearest 100th place.

    [18]

Question 4

4.1   There are three types of orientation systems for direction on a map. Name these three   (3)
different types of North arrows.

4.2   List five map elements.   (5)

4.3   Given a slope of 27.36°, convert your slope to percentage.   (3)

4.4   Given the figure below interpolate the height of point X.   (4)

    [15]

Question 5

5.1   Name the two characteristics of aerial photographs.   (2)

5.2   Name three types of displacement associated with aerial photographs.   (3)

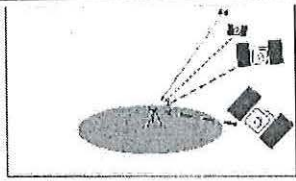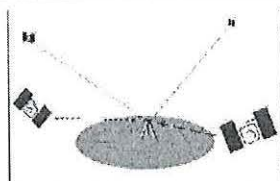5.3   Which have a larger scale; aerial photograph or satellite image?   (4)

5.4   Calculate the size of the area covered by a photograph measuring 18 cm by 9 cm on a scale of   (6)
        1:10 000. Give your answer in hectares.

                                                                                          [15]

Question 6

6.1   List the four types of DOP measures.   (4)

6.2   Study the pictures below and state which picture indicates good satellite geometry and which   (2)
        picture indicates bad satellite geometry.

PICTURE A	PICTURE B

                                                                                          [6]