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 TOWN AND REGIONAL PLANNING, DIPLOMA IN PROPERTY STUDIES	
QUALIFICATION CODE: 07BNRS, 07BGEI, 07BLAM, 08BPRS, 08BOPS, 07BRAR, 07BTAR, 06DIPS, 06DPRS	**LEVEL:** 4
COURSE: INTRODUCTION TO GEOSPATIAL DATA	**COURSE CODE:** IGD411S
SESSION: JUNE 2023	**PAPER:** THEORY
DURATION: 2 HOURS	**MARKS:** 80

FIRST OPPORTUNITY 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 is True or False. (5)

a. Topographic maps are reference maps that mostly contain height information like contour lines and spot heights.

b. A spatial point is defined by an exact location in space. It has volume, area and length.

c. A camera is a remote sensing device.

d. Having a smaller scale, allows more detail to be shown on maps.

e. The more satellites visible to a GPS receiver, the more accurate the determined position becomes.

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Question 2

2.1. Draw two pictures displaying how a point will be displayed using (2)

a. a vector data model and

b. a raster data model

2.2. What type of co-ordinates are used to show horizontal position for each of the following co-ordinate systems? (4)

a. Geographic co-ordinate system

b. Projected co-ordinate system

2.3. Does the earth have a regular shape? Yes / No (1)

2.4. Calculate the straight-line distance from 10° 56′ 20″ E to 38° 47′ 29″ E at 71° 58′ 39″ S. (4)

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Question 3

3.1. The following points represent vertices on Erf number 205, Orwetoveni, Otjozondjupa Region. Calculate the area of the erf. (8)

Point	Y	X
A	-8670.380	-62120.790
B	-8674.620	-62145.930
C	-8724.030	-62136.460
D	-8723.740	-62131.320
E	-8703.540	-62134.900

3.3. Convert the following geographical coordinates into degrees, minutes and seconds. (6)

a. 22.639°S 17.963°E

b. 23.542°S 18.275°E

3.4. A tower is 2 km due north of a church. A windmill is 5 km east of the tower. A map is to be drawn with a scale of 1: 25 000. What will be the distance on the map between the church and the tower? (3)

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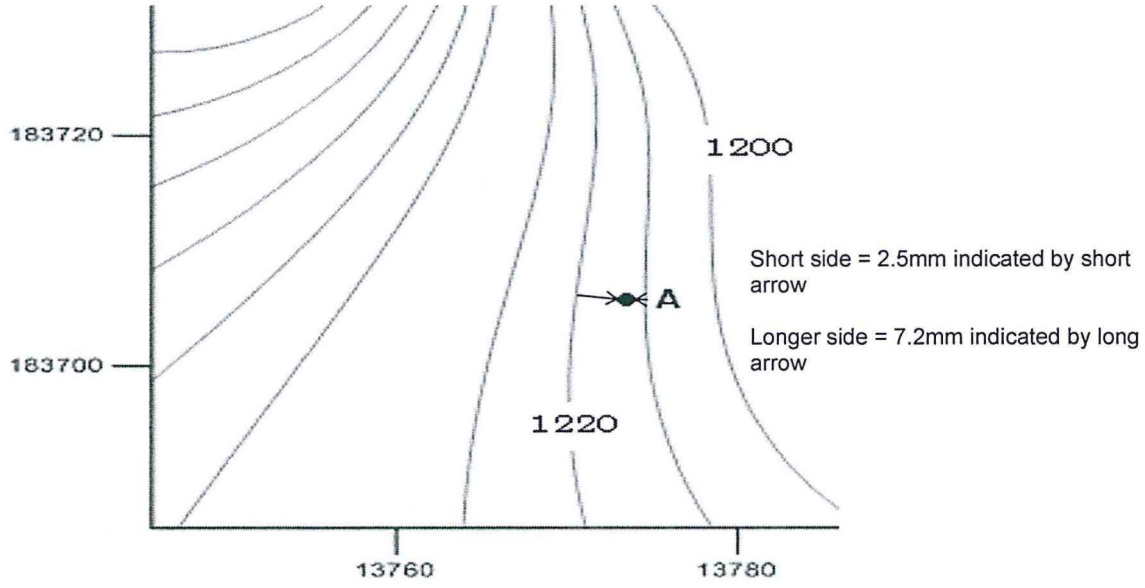
Question 4

4.1 List five map elements. (5)

4.2 List two differences between small scale maps and large scale maps. (4)

4.3 The following is part of a contour map of a planned recreational facility in Otjomuise, Windhoek. Estimate the elevation of point A. (4)



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Question 5

5.1 Select the correct **bold** answer. (3)

a. The scale of a **vertical / oblique** photograph varies from foreground to background.

b. **Vertical / oblique** photography is done in stereo, this results in a 3-dimensional appearance when photographs are viewed together.

c. **Vertical / oblique** photographs are required for mapping applications.

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

5.3 List the four basic requirements to produce an orthophotograph. (4)

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

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Question 6

6.1 List the four types of DOP measures and explain what each DOP indicates. (8)

6.2 Below are two DOP values. indicate the weaker DOP value. (1)

DOP value of 2

DOP value of 9

6.3 List any five error sources of GPS/GNSS error sources, excluding human error. (5)

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