NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING AND SPATIAL SCIENCES

DEPARTMENT OF ARCHITECURE 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, 07BRAR, 07BTAR, 06DPRS	**LEVEL:** 4
COURSE: INTRODUCTION TO GEOSPATIAL DATA	**COURSE CODE:** IGD411S
SESSION: JUNE 2022	**PAPER:** THEORY
DURATION: 2 HOURS	**MARKS:** 80

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER:	MS. D. HUSSELMANN
MODERATOR:	MR E. NAOSEB

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.

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

Question 1

Select only the letter considered to be the correct answer.   (10)

1.1.   The term geospatial data is a composite of two words. "Geo" refers to the earth, and the second

part "spatial data" is data that contains…

a. Data values about satellites in space

b. Data about special state projects

c. Coordinate values

d. None of the above

1.2.   Lines of longitude give direction …

a. East-West

b. North-South

c. South only

d. None of the above

1.3.   A raster model is formed by …

a.   Points and lines

b.   Rows and columns

c.   Lines and polygons

d.   None of the above

1.4.   Which of these form part of the marginal information of a map?

a. Meridians

b. Contour lines

c. North Arrow

d. None of the above

1.5.   Spot heights …

a. Are always the same height above sea level

b. Are always at the centre of contour lines

c. Are just random points on a map with no meaning

d. None of the above

1.6.   We want to map Namibia using the concept of map series. This allows for …

   a. Having a larger scale, allowing more detail to be shown

   b. Having a larger scale, allowing less detail to be shown

   c. Having a smaller scale, allowing more detail to be shown

   d. None of the above

1.7.   Aerial photographs are …

   a. Photographs that are generalised

   b. Photographs that are thrown in the air

   c. Photographs that are captured from the air using a camera

   d. None of the above

1.8.   Stereo photographs result when two photographs are taken from slightly different angles making them appear …………… when viewed together (choose the correct word below).

   a. Clear

   b. Three-dimensional

   c. Accurate

   d. None of the above.

1.9.   Which of these are the same as a satellite?

   a. Receiver

   b. Space vehicle

   c. Drone

   d. None of the above

1.10.   Two different types of GPS positioning modes are:

   a. Absolute positioning and stand-alone positioning

   b. Differential gps and relative gps

   c. Absolute positioning and autonomous positioning

   d. None of the above

                                                                                          [10]

Question 2

2.1.   Geospatial data has three main characteristics, what are they?   (3)

2.2.   Name the coordinate systems that make use of the following coordinates: (2)

      a.   Latitude and longitude coordinates:

      b.   X and Y coordinates:

2.3.   Calculate the straight-line distance from 10° 56′ 20″ S to 38° 47′ 29″ S.   (4)

2.4.   Name (a) the actual shape of the earth and (b) the most convenient mathematical model used for

      measuring locations on earth.   (2)

                                                                                  [11]

Question 3

3.1.   A land parcel located in the Usakos area has the following co-ordinates:

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

      a.   Calculate the distance from A to D.   (3)

      b.   Calculate the area of the land parcel. Give your answer in hectares.   (8)

3.2.   Calculate the scale if the length of the Fish River is 10 cm on the map and 5 km in reality.   (3)

                                                                                   [14]

Question 4

4.1   What is a map?   (2)

4.2   What are contour lines?   (2)

4.3   There are three types of orientation systems for direction on a map. Name these three different

      types of North arrows.   (3)

4.4   Given the following figures, calculate the volume of the dam: (5)

Contour (m)	Area (m²)
1700	3650
1650	3223
1600	2955
1550	2346
1500	2158

4.5   Indicate the slope having a rise value of 35 m and a run value of 88 m (a) as a percentage and (b) as

        an angle in degrees.   (2)

                                                                                         [14]

Question 5

5.1   Name two different types of aerial photography.   (2)

5.2   List the five basic mission calculations performed when preparing for aerial photography.   (5)

5.3   Calculate the scale of a photograph covering Usakos taken at a flying height of 1500 m using an

        aerial camera with a focal length of 152 mm. Round your scale off to the nearest 1000th place.   (3)

5.4   One of the problems associated with aerial photography is relief displacement. Relief displacement

        in aerial photography is not necessarily bad. Name two advantages of relief displacement in aerial

        photographs.   (2)

5.5   List the four basic requirements to produce an orthophoto.   (4)

5.6   What are the advantages of satellite imagery when compared to aerial photography?   (3)

                                                                                         [19]

Question 6

6.1   Name three GPS components.   (3)

6.2   List any four error sources of GPS/GNSS error sources, excluding human error.   (4)

6.3   What is meant by satellite geometry?   (1)

6.4   Draw two pictures; one showing good satellite geometry and one showing bad satellite geometry.

                                                                                                (4)

                                                                                              [12]