



**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: JULY 2023	PAPER: THEORY
DURATION: 2 HOURS	MARKS: 80

SECOND OPPORTUNITY / SUPPLEMENTARY EXAMINATION QUESTION PAPER

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MODERATOR: Mr E. Naoseb

THIS QUESTION PAPER CONSISTS OF 6 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

Select only the letter considered to be the correct answer.

- 1.1. The systems of lines used to locate a certain place on earth are called (1)
- a. Co-ordinate systems
 - b. Latitude systems
 - c. Grid systems
 - d. None of the above
- 1.2. Which reference line passes through both the geographic North Pole and the geographic South Pole? (1)
- a. 0° latitude
 - b. 0° longitude
 - c. Tropic of Cancer (23.5°N)
 - d. None of the above
- 1.3. Isolines are ... (1)
- a. Lines of equal quantity
 - b. lines that connect icebergs of equal height
 - c. lines that show the level of rainfall
 - d. None of the above
- 1.4. Which of these form part of the marginal information of a map? (1)
- a. Meridians
 - b. Contour lines
 - c. Namibian boundary
 - d. None of the above
- 1.5. Satellite images are obtained by ... (1)
- a. satellites in space
 - b. sensors on satellites in space
 - c. cameras on satellites in space
 - d. none of the above
- 1.6. The concept of map series allows for ... (1)
- 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. Ortho photographs are ... (1)
- a. Aerial Photographs that are generalised
 - b. Photographs that are used by orthopaedic surgeons to plan surgery
 - c. Aerial photographs that have been geometrically corrected
 - d. None of the above
- 1.8. The process of studying and gathering the information required in identifying the various cultural and natural features on an aerial photograph is called ... (1)
- a. photo inferring
 - b. photo sensing
 - c. photo interpretation
 - d. none of the above
- 1.9. DGPS stands for? (1)
- a. Direct GPS
 - b. Differential GPS
 - c. Drone GPS
 - d. None of the above
- 1.10. The art and science of making maps is called (1)
- a. cartogrammetry
 - b. maping art
 - c. Photogrammetry
 - d. None of the above

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Question 2

- 2.1. What are the three characteristics of geospatial data? (3)
- 2.2. What do we call the following: (3)
- a. The true shape of the eath
 - b. Mathematical formulaes used to convert the three-dimensional shape of the earth to

a two dimensional flat surface

c. The pattern of Meridians and parallels on the earth

2.3. Calculate the distance from 17.568° S to 29.304° S. (3)

2.4. Select the correct **bold** word in the statement. (2)

a. Different land uses on a map can be identified as **Qualitative / Quantitative** data.

b. A **vector / raster** data model makes use of pixels to display geospatial data.

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Question 3

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

a. 22° 28' 13" S 23° 08' 15" E

b. 24° 55' 04" S 19° 26' 37" E

3.2. Calculate the Great Circle Distance between the two points given in question 3.1 above. (10)

3.3. You have just finished surveying the NUST car parking and you want to determine the scale of your work. An old city map at scale 1: 500 covering part of the car park already exists. If the length of one parking bay measures 25mm on your map and the same length on the city map measures 75mm, determine the scale of the new map? (2)

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Question 4

4.1 List the five properties which can be distorted depending on the map projection used. (5)

4.2 Differentiate between index contour lines and intermediate contour lines. (2)

4.3 Given two scales, 1:50 000 and 1: 250 000, identify the larger scale. (1)

4.4 What is the magnetic declination? (1)

- 4.5 The following points are given to you by a City of Windhoek Town Planner requiring information about the slope of the area.

Point	Y	X	Height
A	-1340.280	+4901.219	1607
B	-1208.643	+5394.320	1718

Calculate the slope from A to B as a:

- a. Percentage (3)
- b. Ratio (1)
- c. Angle (2)

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Question 5

- 5.1 Name two different types of aerial photographs. (2)
- 5.2 Name three types of displacement associated with aerial photographs. (3)
- 5.3 Select the correct **bold** answer. (4)
- An **aerial photograph / satellite image** covers a larger area.
 - An **aerial photograph / satellite image** requires planning before it can be acquired.
 - An **aerial photography / satellite image** has a larger scale.
 - An **aerial photograph / satellite image** contains information recorded from energy in other parts of the electromagnetic spectrum.
- 5.4 Calculate the scale of a photograph covering Rehoboth taken at a flying height of 2000 m using an aerial camera with a focal length of 135 mm. Round your scale off to the nearest 1000 place. (3)

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Question 6

- 6.1 Name and describe the three components that make up a GPS system. (6)

- 6.2 Name two different types of GPS positioning modes. State which one is the least accurate right next to its name. (3)
- 6.3 State one word that define the basis of GPS. (1)
- 6.4 Draw two pictures; one showing good satellite geometry and one showing bad satellite geometry. (4)

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