



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF NATURAL RESOURCES AND SPATIAL SCIENCES**

**DEPARTMENT OF GEO – SPATIAL SCIENCES AND TECHNOLOGY**

<b>QUALIFICATION:</b> BACHELOR OF GEOINFORMATION TECHNOLOGY, BACHELOR OF LAND ADMINISTRATION, BACHELOR OF PROPERTY STUDIES, BACHELOR OF GEOMATICS, BACHELOR OF REGIONAL AND RURAL DEVELOPMENT, BACHELOR OF TOWN AND REGIONAL PLANNING, DIPLOMA IN GEOMATICS, DIPLOMA IN PROPERTY STUDIES, DIPLOMA IN LAND ADMINISTRATION	
<b>QUALIFICATION CODE:</b> 07GITB, 07BLAD, 08BPRS, 07BGEM, 07BRAR, 07BTAR, 06DGEM, 06DPRS, 06DLAD	<b>LEVEL:</b> 4
<b>COURSE CODE:</b> IGD411S	<b>COURSE NAME:</b> INTRODUCTION TO GEOSPATIAL DATA
<b>SESSION:</b> JULY 2019	<b>PAPER:</b> THEORY
<b>DURATION:</b> 2 HOURS	<b>MARKS:</b> 80

<b>SUPPLEMENTARY / SECOND OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
<b>EXAMINER(S)</b>	Ms. Desiré L. Husselmann
<b>MODERATOR:</b>	Mr. Sebastian Mukumbira

<b>INSTRUCTIONS</b>
<ol style="list-style-type: none"><li>1. Answer ALL the questions.</li><li>2. Write clearly and neatly.</li><li>3. Number the answers clearly.</li><li>4. Answers to calculations must be rounded off to three decimal places, excluding answers to co-ordinate conversions</li></ol>

**PERMISSIBLE MATERIALS**

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

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

**Question 1**

State whether the following is True or False.

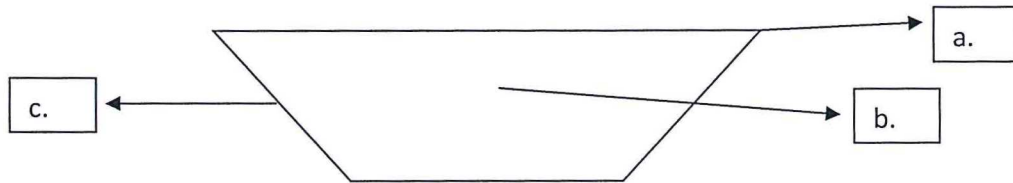
- 1.1. Geospatial data is special data that is referenced to the earth.
- 1.2. A map maker (cartographer) is guided by the main purpose of the map when producing a map and deciding on what data is to appear in the map.
- 1.3. Vertical datum enables us to determine planar and height position of earth features.
- 1.4. With maps it is possible to show full details of all map features on the map.
- 1.5. Maps are flat, but the surfaces they represent are curved.
- 1.6. Contour lines are imaginary lines.
- 1.7. Cameras are one of the most common in-situ sensors.
- 1.8. Aerial photographs are not subjected by relief displacement.
- 1.9. GPS works anywhere in the world, 24 hours a day.
- 1.10. Another name for satellites is SV's which stands for spatial vehicles.

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**Question 2**

- 2.1. A polygon is known to be a vector data model and can be defined as a plane figure that is bound by a closed path or circuit, composing of a finite sequence of straight-line segments. Identify the various parts of the polygon in the figure below. (3)



- 2.2. A graticule is the pattern formed by the meridians and parallels on the earth's surface. List four characteristics of the graticule. (4)
- 2.3. Convert  $23.507^\circ$  S to Degrees, Minutes and Seconds. Show your work. (3)

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**Question 3**

- 3.1. Calculate the spherical distance from A to C. (10)
- |   |                   |                   |
|---|-------------------|-------------------|
| A | $22.8765^\circ$ S | $16.8596^\circ$ E |
| C | $22.0356^\circ$ S | $14.2143^\circ$ E |
- 3.2. The length of a river measures 13 cm on a map with a scale of 1:65 000, while the length of the same river measures 15 cm on a map with an unknown scale. Calculate the scale of the map with an unknown scale. Round your scale off to the nearest 10 000<sup>th</sup>. (3)

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**Question 4**

- 4.1. What is a map projection? (2)
- 4.2. Define two different types of contour lines. (2)
- 4.3. Given the co-ordinates below, calculate the slope in degrees from point A to B. (5)

Point	Y	X	Height (Z)
A	-1542.280	+6879.219	1509
B	-1389.643	+7025.320	1718

- 4.4. State two basic reasons for map generalisation. (4)

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**Question 5**

- 5.1. Explain (a) vertical aerial photography and (b) oblique photographs. (2)
- 5.2. State six factors that affect the spatial resolution of an aerial photograph. (6)
- 5.3. List all the (a) advantages and (b) disadvantages of orthophotos. (5)
- 5.4. On an aerial photograph, the length of a rectangular swimming pool measures 8 cm. The length of the same swimming pool measures 20 m in reality. Calculate the scale of the photograph. (3)
- 5.5. Complete the sentences below: (5)

Satellite imaging apply the concept of (a) ...

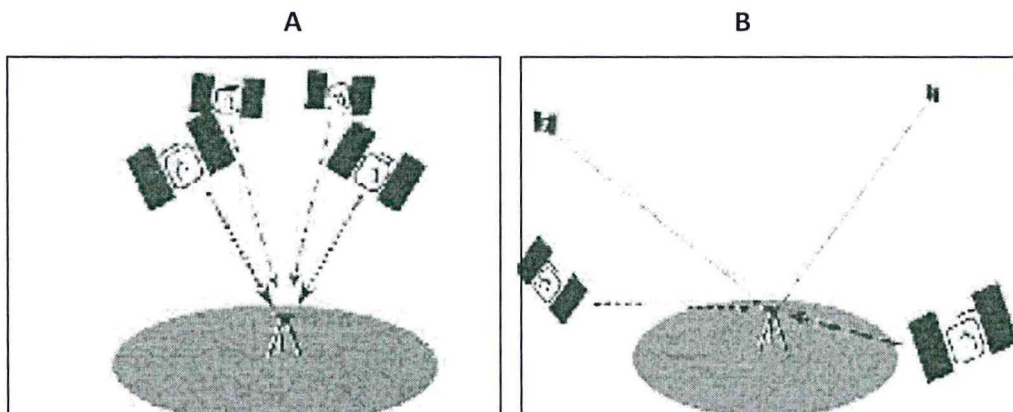
Satellite imaging uses (b) ... to detect and record the (c) ... or ... or ... by the earth's surface.

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**Question 6**

- 6.1. Name two different types of GPS positioning modes. State which one is more accurate right next to its name. (3)
- 6.2. Define the following terms: (4)
- Dilution of Precision  
Satellite Geometry
- 6.3. What does the following stand for? (3)
- HDOP  
PDOP  
GDOP
- 6.4. A number of satellites are tracked by two different receivers; receiver A and receiver B. Name the receiver that will result in the most accurate position if receiver A tracks 4 satellites and receiver B tracks 7 satellites. (1)
- 6.5. Below are two pictures; picture A and Picture B. One of the pictures relate to bad satellite geometry and the other to good satellite geometry. State which one of these two relate to (a) good satellite geometry and which one relates to (b) bad satellite geometry. (2)

**[13]**