



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF NATURAL RESOURCES AND SPATIAL SCIENCES**

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

<b>QUALIFICATIONS:</b> BACHELOR OF GEOINFORMATION TECHNOLOGY; BACHELOR OF LAND ADMINISTRATION	
<b>QUALIFICATIONS CODES:</b> 07GITB 07BLAD	<b>QUALIFICATIONS LEVEL:</b> 6 - 07GITB 6 - 07BLAD
<b>COURSE NAME:</b> GEOINFORMATION MANAGEMENT	<b>COURSE CODE:</b> GMN621S
<b>DATE:</b> JANUARY 2019	<b>SESSION:</b> 2 <sup>nd</sup>
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

**SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION**

**EXAMINERS:** Mr. Lameck Mwewa & Mr. Sebastian Mukumbira

**MODERATOR:** Prof. Thomas Christiansen

**THIS QUESTION PAPER CONSISTS OF 4 PAGES**

**(Excluding this front page)**

***INSTRUCTIONS***

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

***PERMISSIBLE MATERIALS***

1. Calculator
2. Ruler
3. Pencil
4. Eraser

**Question 1**

**1.1** Define the following terms:

- |       |                |            |
|-------|----------------|------------|
| 1.1.1 | Data           | (1)        |
| 1.1.2 | Information    | (1)        |
| 1.1.3 | Geoinformation | (1)        |
|       |                | <b>[3]</b> |
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**Question 2**

**2.1** When one has to introduce a technological innovation to an organization, there are some potential problems that one has to anticipate. List four of these potential problems.

(4)

**[4]**

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**Question 3**

**3.1** Geographic information Systems can be implemented at varying levels, namely, Departmental Level, Enterprise Level and Community/Federated Level, hence the terms Departmental Systems, Enterprise Systems and Community/Federated Systems.

With the help of a table, compare and contrast Departmental Systems and Enterprise Systems.

(6)

**[6]**

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**Question 4**

**4.1** There are several planning and management tools available for GIS planning. These include a Gantt Chart. For this tool (Gantt Chart) do the following

- |       |   |     |
|-------|---|-----|
| 4.1.1 | Explain its principle and its advantages briefly  | (3) |
| 4.1.2 | Compile a sketch figure that illustrates schematically how the tool looks like.                     | (4) |
| 4.1.3 | Indicate (at least) three components (of your choice) that are typical characteristics of the tool. | (3) |

**[10]**

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**Question 5**

**5.1** Understanding the strategic needs of an organization often needs frequent interviews, discussions and observations. Give any 4 guiding questions that you may ask management and rank and file employees during an interview.

(4)

**[4]**

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**Question 6****6.1**

6.1.1 What do the two abbreviations "WMS" and "WFS" stand for? (2)

6.1.2 Explain briefly the important difference between the two. (5)

6.1.3 What is your understanding of the term Spatial Data Infrastructure (SDI)? (2)

6.1.4 Briefly discuss any three components of an SDI. (6)

**[15]**

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**Question 7**

**7.1** An Information Product Description has several components including the title and the name of the department requiring the Information Product. List and describe four more components of an IPD.

(8)

**[8]**

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**Question 8**

**8.1** Data design requires the consideration of various aspects of the data. Name at least four of these aspects.

(4)

**[4]**

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**Question 9****9.1**

9.1.1 Task 1: Assuming the road is 8.4 cm long on a map 1 : 50,000. How long is that road section in nature? (in km!) (2)

9.1.2 Task 2: Assuming a farm is 11.2 km x 5.6 km. On a map it is 6 cm x 3 cm. What is the scale of the map to the nearest 100 000? (3)

9.1.3 Task 3: Ohamakari farm on the outskirts of Okakarara covers a rectangular area

of 8,000 ha. How big (in cm<sup>2</sup>) would the farm be on a map 1 : 100,000? (4)  
 [9]

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**Question 10**

**10.1** When referring to remote sensing data the term 'resolution' may refer to four different types of resolution. Name and briefly explain four of these types of resolution. [One mark for each resolution type mentioned. Three marks for each explanation of the resolution type.] (12)  
 [12]

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**Question 11**

**11.1** If we assume that a map polygon should have a minimum size of 5 x 5 mm, what is the minimum area (in ha) which can be displayed on a map with a scale of 1 : 25,000? (4)  
 [4]

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**Question 12**

**12.1** Which approximate map scale would you need to make sure that your area measurement error for a minimum area of 1000 ha remains below +/- 8%? (2)

Map scale for given area and tolerance					
Minimum Area	% error in area measurement				
Hectares (ha)	1%	3%	5%	8%	10%
0.01	95	286	476	762	952
0.1	301	904	1506	2409	3012
1	652	2857	4762	7619	9524
10	3012	9035	15058	24094	30117
100	9524	28571	47619	76190	95238
1000	30117	90351	150585	240935	301169
1 hectare (ha) = 10 000m <sup>2</sup> = 2.471 acres					

[2]

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**Question 13**

**13.1** Distinguish between thick client and thin client in client-server architecture. Use some real-life examples to illustrate your answer. (6)

[6]

**Question 14****14.1** Define the following terms in reference to Cost-Benefit analysis:

14.1.1 Base year (2)

14.1.2 Break-even (2)

<i>Year</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2012</i>	<i>2022</i>
<b>Total Costs (N\$)</b>	250000	255000	245000	230000	227000	228000	228000
<b>Cumulative Costs</b>							
<b>Total Benefits (N\$)</b>	0	0	140000	180000	360000	420000	680000
<b>Cumulative Benefits</b>							

14.1.3 Assuming a discount rate of 5%, calculate the following:

a) Cumulative costs for the period 2017 to 2023. (3)

b) Cumulative benefits for the same period. (3)

c) The cumulative benefits to cumulative costs ratio discounting. (3)

[13]