education

MPUMALANGA PROVINCE

REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

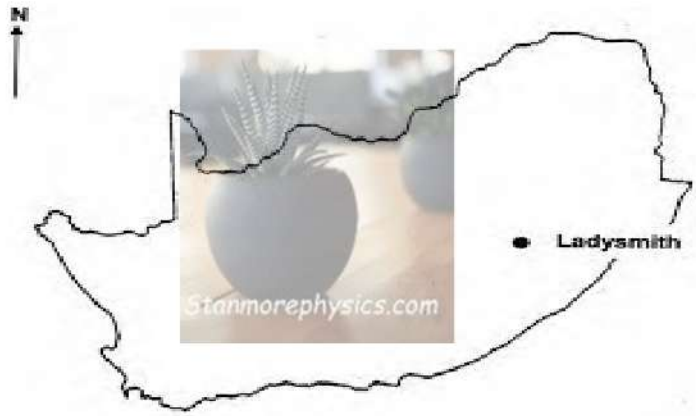
NAME & SURNAME	
GRADE	**12**
DATE	**13 MARCH 2025**
SUBJECT	**GEOGRAPHY TASK 1**

Question	**01**	**02**	**03**	**Total**	**%**	
Total Mark	**20**	**24**	**16**	**60**		**Signatures:**
Educator's Mark						
Moderator's Mark						

This question paper consists of 9 pages (including cover page).

1. A 1:50 000 topographical map (2829 DB LADYSMITH) and a 1:10 000 orthophoto map (2829 DB 6 LADYSMITH of a part of the mapped area are provided).
2. All questions are based on the 1:50 000 topographical map (2829 DB LADYSMITH), 1:10 000 orthophoto – rectified image (2829 DB 6 LADYSMITH).
3. The area demarcated in RED on the topographic map represents the area covered by the orthophoto map.
4. You may use magnifying glass
5. Kindly hand in ALL the material given to you by the invigilator/educator.
6. This document serves both as a question paper as well as the answer sheet for this task.

GENERAL INFORMATION OF LADYSMITH



Ladysmith (renamed uMnambithi in 2024) is a town in the Uthukela District of KwaZulu-Natal, South Africa. It lies 230 kilometres (140 mi) northwest of Durban and 365 kilometres (227 mi) south-east of Johannesburg. Ladysmith is located on the banks of the Klip River ("stone river"), with the central business district and a large part of the residential areas located within the flood basin of the river. It is on the foothills of the Drakensberg mountains, about 26 km from the Van Reenen's Pass. The town has a subtropical highland climate (Cwb, according to the Köppen climate classification), with warm summers and cool, dry winters. It borders on a humid subtropical climate (Cwa). The average annual precipitation is 639 mm (25 in), with most rainfall occurring during summer.

QUESTION 1 – MULTIPLE CHOICE QUESTIONS

1.1. Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) in the block next to each question.

1.1.1. Ladysmith is found in… province

A Western Cape
B Eastern Cape
C KwaZulu-Natal
D Mpumalanga

1.1.2. The feature located in 28°31'20"S and 29°48'50"E represents a…on a topographic map

A police Station
B ruin
C place of Worship
D buildings

1.1.3. The contour line 1080 in block **A5** on topographic map shows that…in block A5

A height is 1080 meters below sea level
B joins places with the height of 1080 meters
C contour interval is 1080 meters
D the topography is gentle

1.1.4. Direction of Glencoe from block **C2** using N11 national route / road is…

A from Southwest to Northeast
B from Northeast to Southwest
C from North to South
D from South to North

1.1.5. A feature marked **J** on the topographic map is a…

A mine dump
B cemetery
C embankment
D excavation

(1 x 5) (5)

1.2. MAP CALCULATIONS

1.2.1. Determine the true bearing from spot height 1159 in block **A1**to trig beacon 1118 in block **A2** on the topographic map. (2 x 1) (2)

1.2.2. Refer to the topographic map to answer the following questions on magnetic declination for 2025.

a) The difference in years is… (1 x 1) (1)

b) The mean annual change is… (1 x 1) (1)

c) Use the answers from question 1.2.2. (a) and 1.2.2. (b) to calculate the current magnetic declination.

(3 x 1) (3)

1.2.3. Use your answer in question 1.2.1. and 1.2.2. (c) to calculate the magnetic bearing.

Formula: Magnetic Bearing = Magnetic declination + True bearing

(2 x 1) (2)

1.2.4. Calculate the area of point **6** that is demarcated by a red square on the orthophoto map in km². Show all your calculations.

Formula: Area = Length x Breadth (4 x 1) (4)

1.2.5. Calculate the distance in meters between **I** and **J** on the topographic map.

Formula: Actual distance = Map distance x Map scale (2 x 1) (2)

QUESTION 2 – MAP INTERPRETATION

2.1. Refer to the orthophoto map.

2.1.1 a) Choose one option from those given in brackets.

(**Anabatic / Katabatic**) wind would develop from the mountain in Maiden Castle in block **E2** and blow toward the foot of the mountain labelled in block **D3**. (1 x 2) (2)

b) Refer to the map and describe how the local winds you mentioned in 2.1.1 (a) would occur. (2 x 2) (4)

_____

_____

_____

2.1.2. The area in block **D1** on the Orthophoto map is not suitable for construction of buildings. Support the statement above by quoting evidence from the map. (2 x 2) (4)

_____

_____

_____

2.1.3. Refer to the table below showing records of temperature in block **A4** and block **C2** on the orthophoto map.

Day	Time	Temperature Recording in °C	Temperature Recording in °C
		Block A4	Block C2
Day 1	12h00 – 14h00	12°C	10°C
Day 2	12h00 – 14h00	10°C	8°C
Day 3	12h00 – 14h00	18°C	12°C

[Source: examiner's own sketch]

a) On what day was the highest temperature difference experienced? (1)

_____

b) On what day was the lowest temperature difference experienced? (1)

_____

c) Compare the record of temperature for block **C2** and block **A4** in day 3. (2 x 2) (4)

_____

_____

_____

_____

d) Refer to the orthophoto map.
Quote evidence from the map and explain why temperature records differ in block **C2** and block **A4**. (2 x 2) (4)

_____

_____

_____

_____

e) The mapped area (on the topographic map) receives seasonal rainfall. Give **TWO** points of evidence from the topographic map to support this statement. (2 x 2) (4)

_____

_____

_____

_____

QUESTION 3 – GIS

3.1. Various options are provided as possible answers to the following questions. Choose the correct answer and writhe only the letter (A-D) in the block next to each question.

3.1.1. Refers to the degree of detail and clarity in terms of location and shape of geographic features.

A Spectral resolution
B Low resolution
C Spatial resolution
D High resolution

3.1.2. Remote sensing device.

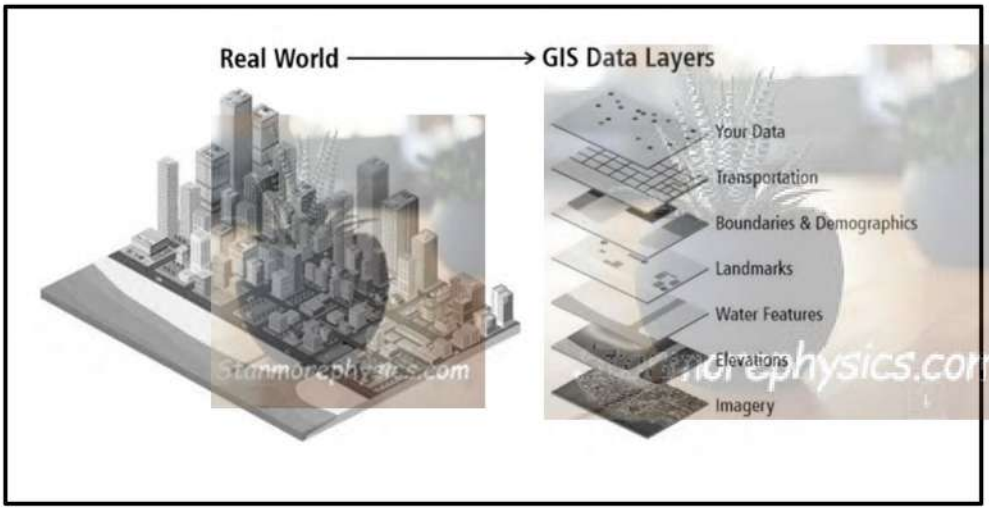
A Cellphone
B Laptop
C Method
D Satellites

3.1.3. Component of GIS that collect, manipulate and process data.

A Software
B Hardware
C Data
D People

(1 x 3) (3)

3.2. Refer to the diagram below on data layering and answer the questions that follow.



3.2.1. Define the concept *data layering*. (1 x 2) (2)

_____

_____

_____

3.2.2. Identify the transport data layer in **Block B1** on the topographical map.

(1 x 2) (2)

_____

_____

3.2.3. The vertical aerial photograph is used to make the orthophoto map has a (**high/low**) resolution) (1 x 1) (1)

_____

3.2.4. The reference of the topographical map represents (**spatial/attribute)** data. (1 x 1) (1)

_____

3.2.5. Differentiate between the raster and vector data.

Raster data (1 x 2) (2)

_____

_____

_____

Vector data (1 x 2) (2)

_____

_____

_____

3.3. Remote sensing involves capturing data of objects on the earth's surface from distance or without being in contact.

3.3.1. State one use of remote sensing in real world. (1 x 1) (1)

_____

_____

_____

3.3.2. Discuss **ONE** disadvantages of using remote sensing. (1 x 2) (2)

_____

_____

_____

TOTAL: 60

education

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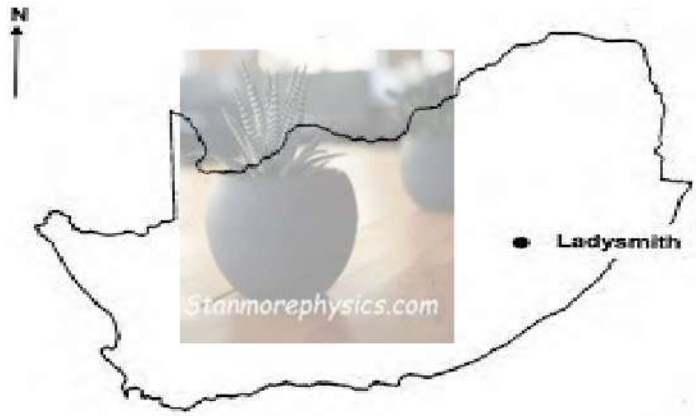

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D Mpumalanga

B

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A police Station
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D

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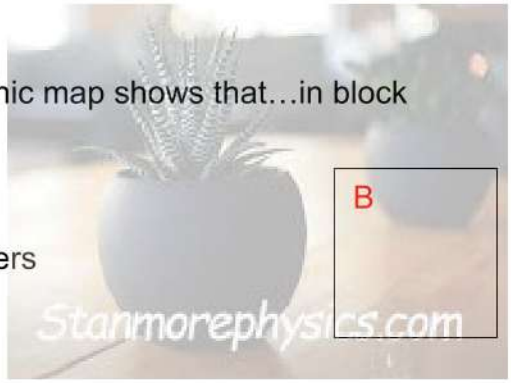

B

1.1.4. Direction of Glencoe from block **C2** using N11 national route / road is…

A from Southwest to Northeast
B from Northeast to Southwest
C from North to South
D from South to North

A

1.1.5. A feature marked **J** on the topographic map is a…

A mine dump

D

B cemetery

C embankment

D excavation

(1 x 5) (5)

1.2. MAP CALCULATIONS

1.2.1. Determine the true bearing from spot height 1159 in block **A1**to trig beacon 1118 in block **A2** on the topographic map. (2 x 1) (2)

- True Bearing = 93° √√

1.2.2. Refer to the topographic map to answer the following questions on magnetic declination for 2025.

a) The difference in years is… (1 x 1) (1)

- 2025 – 2001 = 24 years √

b) The mean annual change is…

- 8'W √

(1 x 1) (1)

c) Use the answers from previous questions to calculate the current magnetic declination. (3 x 1) (3)

- 2025 – 2001 = 24 years
- 8'W x 24 years = 192'W √
- 21°03'W + √ 192'W = 24°15' West Of True North √

1.2.3. Use your answer in question 1.2.1 and 1.2.2 to calculate the magnetic bearing.

Formula: Magnetic Bearing = Magnetic declination + True bearing

(2 x 1) (2)

- 24°15' W + 93° = 117°15'W √√

1.2.4. Calculate the area of point **6** that is demarcated by a red triangle on the orthophoto map in km². Show all your calculations.

Formula: Area = Length x Breadth (4 x 1) (4)

- L = 3.1 cm x 0.1 = 0.31 km √
- B = 2.2 cm x 0.1 = 0.22 km √
- Area = 0.1 km x 0.22 km √ = 0,022 km² √

1.2.5. Calculate the distance in meters between **I** and **J** on the topographic map.

Formula: Actual distance = Map distance x Map scale (2 x 1) (2)

- 7 cm x 500 = 3500 m √√

QUESTION 2 – MAP INTERPRETATION

2.1. Refer to the orthophoto map.

2.1.1 a) Choose one option from those given in brackets.

(**Anabatic / Katabatic**) wind would develop from the mountain in Maiden Castle in block **E2** and blow toward the foot of the mountain labelled in block **D3**. (1 x 2) (2)

- Katabatic winds √√

b) Refer to the map and describe how the local winds you mentioned in 2.1.1 (a) would occur. (2 x 2) (4)

- Occurs during the night √√
- Cooling of the Maiden Castle due to temperature inversion √√
- Cool air becomes heavy and dense √√
- Air flows downslope √√

2.1.2. The area in block **D1** on the Orthophoto map is not suitable for construction of buildings. Support the statement above by quoting evidence from the map. (2 x 2) (4)

- Steep slope would prevent construction of buildings √√
- Contour lines are close to each other indicating steep slope, it would be costly √√

2.1.3. Refer to the table below showing records of temperature in block **A4** and block **C2** on the orthophoto map.

Day	Time	Temperature Recording in °C	Temperature Recording in °C
		Block A4	Block C2
Day 1	12h00 – 14h00	12°C	10°C
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Day 3	12h00 – 14h00	18°C	12°C

[Source: examiner's own sketch]

a) On what day was the highest temperature difference experienced? (1)

- Day 3 √

b) On what day was the lowest temperature difference experienced? (1)

- Day 2 √

c) Compare the record of temperature for block **C2** and block **A4** in day 3. (2 x 2) (4)

- Temperature in day 3 showed higher temperatures in block A4 √√
- Temperature in day 3 showed lower temperatures in block C2 √√

d) Refer to the orthophoto map.
Quote evidence from the map and explain why temperature records differ in block **C2** and block **A4**. (2 x 2) (4)

- In block C2 density of buildings limit the inflow of air, this causes higher temperatures. √√
- In block A4 there is low building density which allows air to flow freely and to reduce temperatures. √√
- Block C2 is situated in the city center whilst block A4 is situated on the outskirt of the city. √√
- In block A4 there is more vegetation that contribute in reducing temperatures whilst block C2 has more built up areas (artificial surfaces) that absorb heat and increases temperatures. √√

e) The mapped area (on the topographic map) receives seasonal rainfall.
Give **TWO** points of evidence from the topographic map to support this statement. (2 x 2) (4)

- Reservoirs √√
- Dams √√
- Non-perennial river √√

- Wind pump √√
- Furrows √√
- Canals √√

QUESTION 3 – GIS

3.1. Various options are provided as possible answers to the following questions. Choose the correct answer and writhe only the letter (A-D) in the block next to each question.

3.1.1. Refers to the degree of detail and clarity in terms of location and shape of geographic features.

A Spectral resolution
B Low resolution
C Spatial resolution
D High resolution

D

3.1.2. Remote sensing device.

A Cellphone
B Laptop
C Method
D Satellites

D

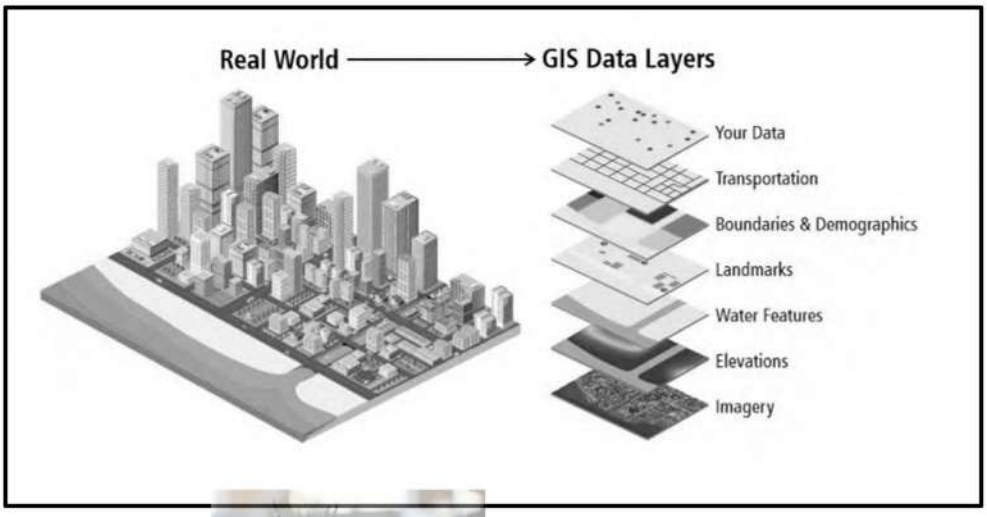
3.1.3. Component of GIS that collect, manipulate and process data.

A Software
B Hardware
C Data
D People

D

(1 x 3) (3)

3.2. Refer to the diagram below on data layering and answer the questions that follow.



3.2.1. Define the concept *data layering*. (1 x 2) (2)

- It refers to when different kinds of data are placed on top of one another to produce a map on an area. √√

3.2.2. Identify the transport data layer in **Block B1** on the topographical map. (1 x 2) (2)

- Main road. √√

3.2.3. The vertical aerial photograph is used to make the orthophoto map has a (**high/low**) resolution) (1 x 1) (1)

- Low. √

3.2.4. The reference of the topographical map represents (**spatial/attribute)** data. (1 x 1) (1)

- Spatial √

3.2.5. Differentiate between the raster and vector data.

Raster data (1 x 2) (2)

- Consist of grid or cells in rows and columns called pixels. √√

Vector data (1 x 2) (2)

- Use coordinates to specify the location of points, lines and polygon features on a map. √√

3.3. Remote sensing involves capturing data of objects on the earth's surface from distance or without being in contact.

3.3.1. State one use of remote sensing in real world. (1 x 1) (1)

- Monitoring environmental changes e.g. deforestation √
- Disaster management e.g. tracking floods √
- Urban planning by analyzing land use patterns √
- Agriculture by assessing crop health √
- Weather forecasting by observing clouds formations √
- Geological studies by mapping terrain features √

3.3.2. Discuss **ONE** disadvantages of using remote sensing. (1 x 2) (2)

- Is a fairly expensive method of analyzing especially when measuring or analyzing smaller areas √√
- Requires a special kind of training to analyze the images √√
- Human errors may occur during the analyzing process √√
- Sometimes different phenomena being analyzed may look the same during measurement which may lead to classification error √√
- Sometimes large-scale engineering maps cannot be prepared from satellite data which makes remote sensing data collection incomplete √√

TOTAL: 60