SEDIBENG WEST

TYPE OF TASK: FINAL EXAMINATION

PAPER 1

SUBJECT	:	GEOGRAPHY
GRADE	:	11
TIME	:	3 HOURS
TOTAL	:	150 MARKS
DATE OF IMPLEMENTATION	:	7 NOVEMBER 2024
EXAMINER	:	SEDIBENG WEST
MODERATOR	:	SEDIBENG EAST

This question paper consists of 23 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS:

   SECTION A:
   QUESTION 1: Atmosphere (60)
   QUESTION 2: Geomorphology (60)

   SECTION B:
   QUESTION 3: Geographical Skills and Techniques (30)

2. Answer ALL THREE questions.
3. All diagrams are included in the QUESTION PAPER
4. Leave a line open between sub-sections of questions answered.
5. Start EACH question at the top of a NEW page.
6. Number the answers correctly according to the numbering system used in this question paper.
7. Do NOT write in the margins of the ANSWER BOOK.
8. Draw fully labelled diagrams when instructed to do so.
9. Answer in FULL SENTENCES, except when you have to state, name, identify or list.
10. Units of measurement MUST be indicated in your final answer, e.g., 1 020 hPa, 14 °C and 45 m.
11. You may use a non-programmable calculator and magnifying glass.
12. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

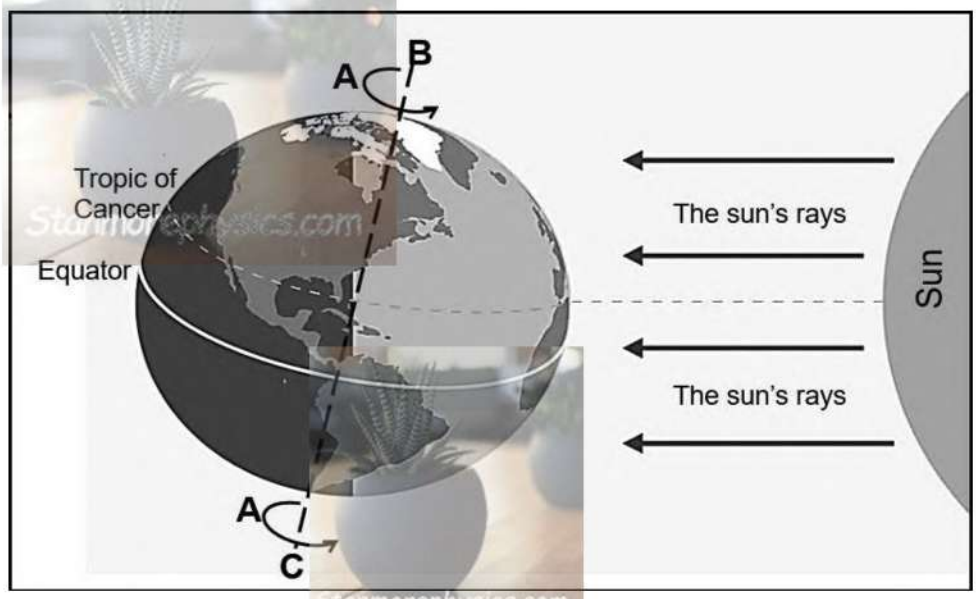
13. A 1:50 000 topographic map **2726 BC** BOTHAVILLE **OR 3320 BB LAINGSBURG** and a 1: 10 000 orthophoto map **2726 BC 13** BOTHAVILLE **OR 3320 BB 17, 18, 22, 23 LAINGSBURG** are provided.
14. The area demarcated in RED/BLACK on the topographic map represents the area covered by th orthophoto map.
15. Show ALL calculations. Marks will be allocated for this.
16. You must hand in the topographic and the orthophoto map to the invigilator at the end of this examination session.

ATMOSPHERE AND GEOMORPHOLOGY

QUESTION 1: ATMOSPHERE

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.8) in the ANSWER BOOK, for example 1.1.9 D.

Refer to the sketch below of the earth's axis to answer QUESTIONS 1.1.1 to 1.1.5.



[Adapted from https://www.spacecentre.nz/resources/faq/solar-system/earth/rotation-speed.html]

1.1.1 The season, the southern hemisphere experiences is …

A autumn.
B winter.
C spring.
D summer.

1.1.2 The arrows at **A** shows the … of the earth.

A circle of illumination
B revolution
C rotation
D circle of parallelism

1.1.3 The sketch illustrates a/an … situation, with the days being … than/to the night at the equator.

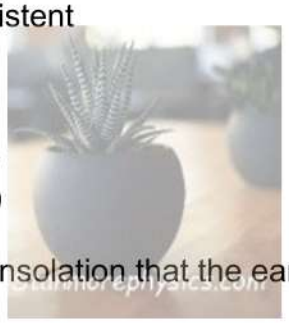
(i) solstice
(ii) equinox
(iii) longer
(iv) equal

A (i); (iii)
B (i); (iv)
C (ii); (iii)
D (ii); (iv)

1.1.4 Line **B**–**C** represents the … of the earth's axis and is … throughout the year.

(i) dynamism
(ii) parallelism
(iii) consistent
(iv) inconsistent

A (i); (iii)
B (i); (iv)
C (ii); (iii)
D (ii); (iv)

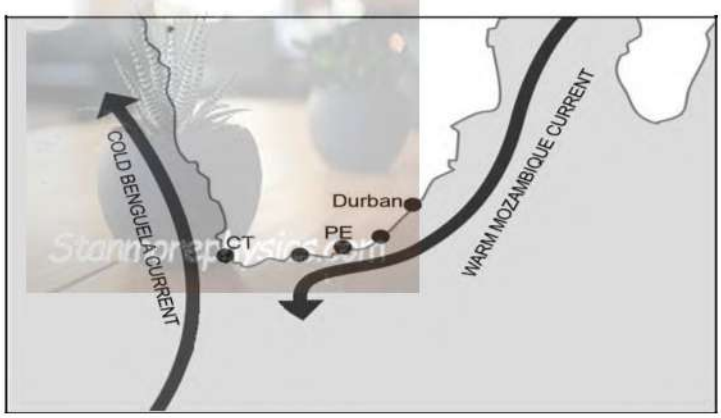


1.1.5 The amount of insolation that the earth receives depends on … and …

(i) latitude
(ii) rotation
(iii) seasons
(iv) revolution

A (i); (iii)
B (i); (iv)
C (ii); (iii)
D (ii); (iv)

1.1.6 Refer to the below sketch on ocean currents to answer QUESTIONS 1.1.6 to 1.1.8.



[Adapted from https://www.google.com/search?q=Warm+Mozanbique+current&tbm=]

1.1.6 The ocean currents in the sketch play a combined role in shaping weather patterns by …

A increasing temperatures.
B moderating temperatures.
C decreasing temperatures.
D increasing rainfall.

1.1.7 The cold Benguela Ocean current transfers … air from the poles to the … zones.

A cold; temperate
B warm; coastal
C cold; coastal
D warm; desert

1.1.8 Warm ocean currents move from the … to the …

A poles; equator.
B west; poles.
C east; equator.
D equator; poles

(8 x 1) **(8)**

1.2 Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, for example 1.1.8 latitude

1.2.1 The wind belt located between 60° and 90° north and south of the equator is referred to as the (polar easterly/westerly) wind belt.

1.2.2 The (Polar/Hadley) cell is located between 0°and 30° north and south of the equator.

1.2.3 At the equator, there is surface (divergence/convergence) of air masses.

1.2.4 The (polar front/cold front) is associated with the convergence of cold and warm air masses.

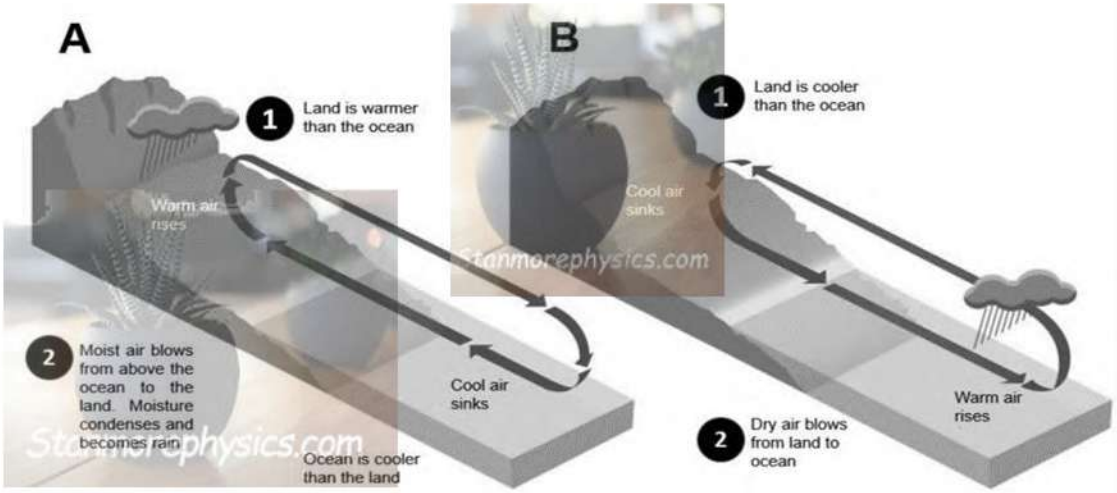
1.2.5 The unit of measurement for atmospheric pressure is (hectopascal/ degrees celsius)

1.2.6 At the 30° north and south of the equator a surface (high pressure/low pressure) forms.

1.2.7 The formation of a Mid-latitude cyclone is usually associated with the (30°/60°) latitudes.

(7 x 1) **(7)**

1.3 Refer to figure 1.3 / the infographic …… showing



1.3.1 Match sketch A with either a summer or winter monsoon wind over the subcontinent of India. (1 x 1) (1)

1.3.2 Identify the direction of the monsoon wind, according to the extract, that blows in sketch **A**. (1 x 1) (1)

1.3.3 Why does this wind that you identified in QUESTION 1.4.2 bring heavy rainfall to the Indian subcontinent? (1 x 1) (1)

1.3.4 What positive physical (natural) impact will this heavy rainfall have on the Indian subcontinent? (2 x 2) (4)

Refer to sketch **B**.

1.3.5 Describe the weather conditions that would prevail over the Indian subcontinent in sketch **B**. (2 x 1) (2)

1.3.6 Explain the negative economic impact that the subcontinent of India would experience if the conditions in sketch B are prolonged (continued). (3 x 2) (6)

[15]

1.4 Refer to the map and extract on desertification.

Soaring temperatures and improper disaster management have resulted in increased desertification rates across the globe. Coupled with droughts and a drop in agricultural productivity, the effects of desertification cannot be ignored. To curb such high rates of land degradation that many regions of the world are experiencing, effective risk management is needed. Desertification is a huge issue also in Africa.

For example, poor harvesting and a surge in barren lands continue to plague the inhabitants of Tanzania. In Mauritania, a drop in rainfall has worsened agricultural production and has left many farmers struggling to grow enough food to eat or sell. Desertification can also cause loss of biodiversity and loss of *aquifers. In Africa, with nearly 45% of the landmass experiencing desertification, many people face even greater risks. In Mauritania, the dire situation has caused food insecurity, housing problems and population health declines. Villagers are trying to migrate as their houses become buried under the sand in addition to a lack of water sources and income.

* A body of rock or sediment saturated with groundwater.

[Source: https://earth.org/desertification-in-africa/]

1.4.1 What is *desertification*? (1 x 2) (2)

1.4.2 Identify the major desert on the map. (1 x 1) (1)

1.4.3 State ONE negative physical (natural) impact, according to the extract, of desertification. (1 x 1) (1)

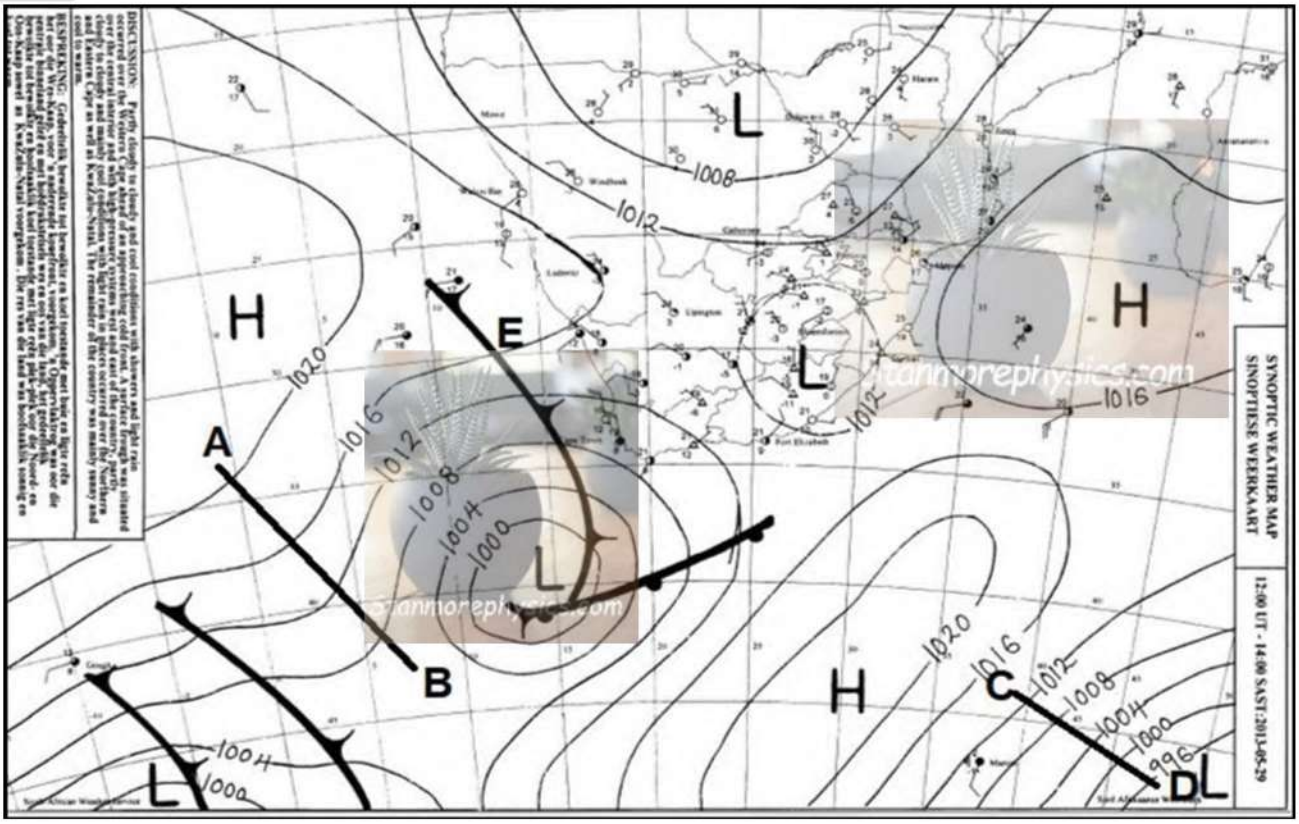
1.4.4 Why is the Sahel regarded as a high-risk area? (1 x 1) (1)

1.4.5 Explain the negative social impact that a drop in productivity will have on the people of Africa. (2 x 2) (4)

1.4.6 Suggest measures that farmers could implement to reduce the spread of desertification. (3 x 2) (6)

[15]

1.5 Refer to figure below showing a synoptic weather map.



1.5.1 Determine the isobaric interval for this synoptic weather map (1 x 1) (1)

1.5.2 Identify the weather symbol labelled **E**. (1 x 1) (1)

1.5.3 State the season represented by this synoptic weather map (1 x 1) (1)

1.5.4 Compare the pressure gradient at **A – B** with the pressure gradient at **C–D**. (2 x 2) (4)

1.5.5 In a paragraph of approximately EIGHT lines, explain the influence of the oceanic high-pressure systems on weather conditions along the east and west coast of South Africa. (4 x 2) (8)

[15]
[60]

QUESTION 2: GEOMORPHOLOGY

2.1 Read the following statements and choose the appropriate word(s) in brackets which will make the statement TRUE. Write down only the question number (2.1.1 to 2.1.7) and the answer in your ANSWER BOOK. E.g. 2.1.8

2.1.1 (Igneous/Sedimentary) rocks forms when molten magma solidifies on the earth's crust.

2.1.2 A (laccolith/lopolith) is characterised by a "saucer" shape intrusion.

2.1.3 A serrated ridge on the Earth surface is when a (dome/dyke) is exposed on the surface of the earth.

2.1.4 When a sill is exposed on the Earth surfaces it generally forms a (mesa/ dome).

2.1.5 The (sill/batholith) is the largest and deepest of all intrusive features.

2.1.6 The intrusive feature mostly associated with a "mushroom" shape is a (laccolith/ batholith).

2.1.7 When a batholith is exposed on the Earth surface a (mesa/dome) is formed.

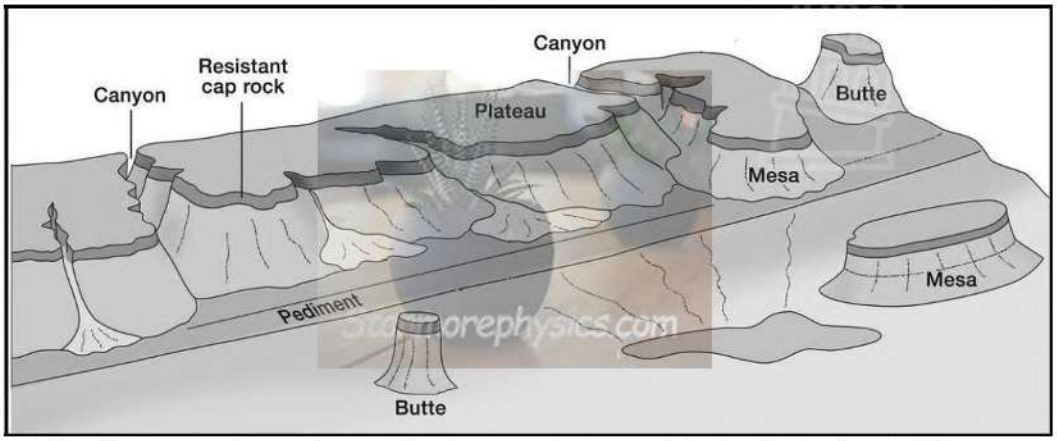
(7 x 1) (7)

2.2 Refer to the sketch below and complete the statements in COLUMN A with the options in COLUMN B. Write down only **Y** or **Z** next to the question numbers (2.2.1 to 2.2.8) in the ANSWER BOOK, e.g., 2.2.9 Y.

	Column A	**Column B**	
2.2.1	Large area with deep steep sided valleys with narrow valley floors.	**Y** **Z**	Karoo Landscape Canyon
2.2.2	The plateau is reduced in width due to the process of back wasting, thereby creating this feature.	**Y** **Z**	Canyon Mesa
2.2.3	Flat topped hills with a greater height than width.	**Y** **Z**	Mesa Butte
2.2.4	Landform where the resistant cap rock has been removed.	**Y** **Z**	Cornical hill Butte
2.2.5	A large flat area elevated above sea level.	**Y** **Z**	Canyon Plateau
2.2.6	Hard resistant rock found on the top of horizontal features like mesa and butte.	**Y** **Z**	Caprock Escarp
2.2.7	Landscape that consists of flat-topped mountains of different widths.	**Y** **Z**	Karoo Landscape Canyon
2.2.8	The process of back wasting is also referred to as …	**Y** **Z**	Deposition Parallel retreat

(8 x 1) (8)

2.3 Refer to the sketch on topography associated with horizontally layered rocks.



[Source: https://www.google.com/search?q=topography+associated+with+horizontally]

2.3.1 Comment on the height of the topography evident in the sketch. (1 x 1) (1)

2.3.2 Provide evidence from the sketch for your answer to QUESTION 2.3.1 (1 x 1) (1)

2.3.3 The topography above is (uniformly/not uniformly) resistant to erosion. (1 x 1) (1)

2.3.4 Explain TWO ways how do canyons form? (2 x 2) (4)

2.3.5 Explain how the elements of the Karoo landscape evident in the sketch will form from a canyon landscape. (2 x 2) (4)

2.3.6 How can the topography in the sketch associated with horizontally layered rocks be utilised economically by people? (2 x 2) (4)

[15]

2.4 Refer to the photos on topography associated with massive igneous rocks.

2.4.1 Identify the landforms associated with massive igneous rocks in photo A and photo B. (2 x 1) (2)

2.4.2 Name ONE characteristic of massive igneous rocks that is evident in the sketch. (1 x 1) (1)

2.4.3 From what igneous intrusions do the landforms in photo A and photo B originate? (2 x 1) (2)

2.4.4 How are these landforms in photo A and photo B exposed on the earth's surface? (1 x 2) (2)

2.4.5 In a paragraph of approximately EIGHT lines, explain the role of weathering in the formation of these two landforms. (4 x 2) (8)

[15]

2.5 Refer to the photograph and extract on a landslide.

[Source: google images]

In eThekwini, combinations of sloping ground, water and clay left trails of devastation in their wake during the recent floods.

Some articles have suggested the catastrophes in Durban and the greater eThekwini region of South Africa following recent floods are due to climate change and maladministration. While these factors play a role, the fact that landslides occurred comes as no surprise, considering the geology of the area.

eThekwini is a coastal metropolis characterised by hilly terrain dissected by several major rivers such as the Umgeni, Mlazi and Mbokodweni. The region is subtropical, but recent rains were abnormal relative to recent records and resulted in multiple landslides. The negative social, economic, and physical impact on the region has been disastrous.

[Adapted from an article by Charles Macrobert]

2.5.1 How does the photograph depict a landslide? (1 x 1) (1)

2.5.2 According to the article, what is the main cause of landslides in the greater eThekwini region. (1 x 1) (1)

2.5.3 What climatic evidence in the article suggests that the eThekwini region receives high rainfall? (1 x 1) (1)

2.5.4 What role did heavy rainfall play in the development of landslides? (2 x 2) (4)

2.5.5 Account for the negative social impact of landslides in the region. (2 x 2) (4)

2.5.6 Suggest strategies that the municipality of eThekwini could adopt to minimise the effects of landslides. (2 x 2) (4)

[15]
[60]

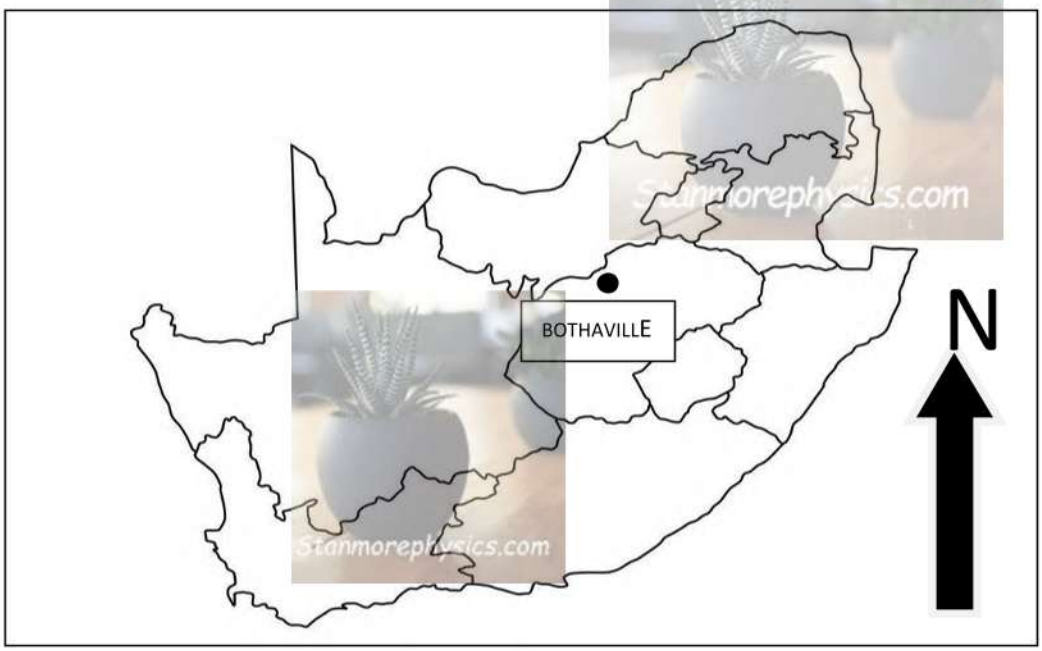
OPTION 1

SECTION B:

LEARNERS NEED TO CHOOSE WHICH MAP WORK SECTION THEY HAVE TO DO, ACCORDING TO THE MAP SUPPLIED BY THE SCHOOL.

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

BACKGROUND INFORMATION ON BOTHAVILLE



Coordinates: 27°37'40"S, 26°62'00"E

Bothaville is situated in the north-western parts of the Free State Province. It is situated 60 km east of the Vaal, on the bank of its Vals River tributary. The town of Bothaville is considered to be one of the richest agricultural districts in the country. It forms a key pillar in the so-called maize triangle as the heartland of South Africa's maize producing region. The district of Bothaville is also a major producer of other grain such as sunflower seeds, sorghum, peanuts, etc., and this serves as the major reason why Bothaville has become a bustling rural town, with a lively business sector. The town is officially known as the Maize Capital of South Africa.

[Source: https://web.archive.org/web/20100516143452/http://www.bothavillemaizecapital.co.za/]

The following English terms and their Afrikaans translations are shown on the topographic map.

ENGLISH	AFRIKAANS
Water purification plant	Water suiweringsaanleg
Sewage works	Rioolwerke
Weir	Keerwal
Golf course	Gholfbaan
Landing strip	Landingstrook

3.1 MAP SKILLS AND CALCULATIONS

Various options are provided as possible answers to QUESTIONS 3.1.1 and 3.1.2. Choose the answer and write only the letter (A–D) next to the question numbers (3.1.1 and 3.1.2) in the ANSWER BOOK.

3.1.1 In the topographical map index **2726 BC**, the **27** and **26** indicates …

A 27°N 26°W
B 27°S 26°E
C 27°W 26°E
D 27°E 26°S (1 x 1) (1)

3.1.2 The man-made polygon features in block **E3** on the orthophoto map is a/an …

A dam
B golf coarse
C Excavations
D cemetary (1 x 1) (1)

3.1.3 Refer to the topographical map.

(a) Calculate the distance of the landing strip in at **F** in (Block **C3** and **B3/4)** in meters (m) (2 x 1) (2)

Formula: **Actual distance = Map distance x Map scale**

(b) Calculate the area of the orthophoto map represented on the topographic map in red if the length is 3.9 cm and the breadth is 3.2 cm on the topographic m (3 x 1) (3)

Formula: Area = L x B

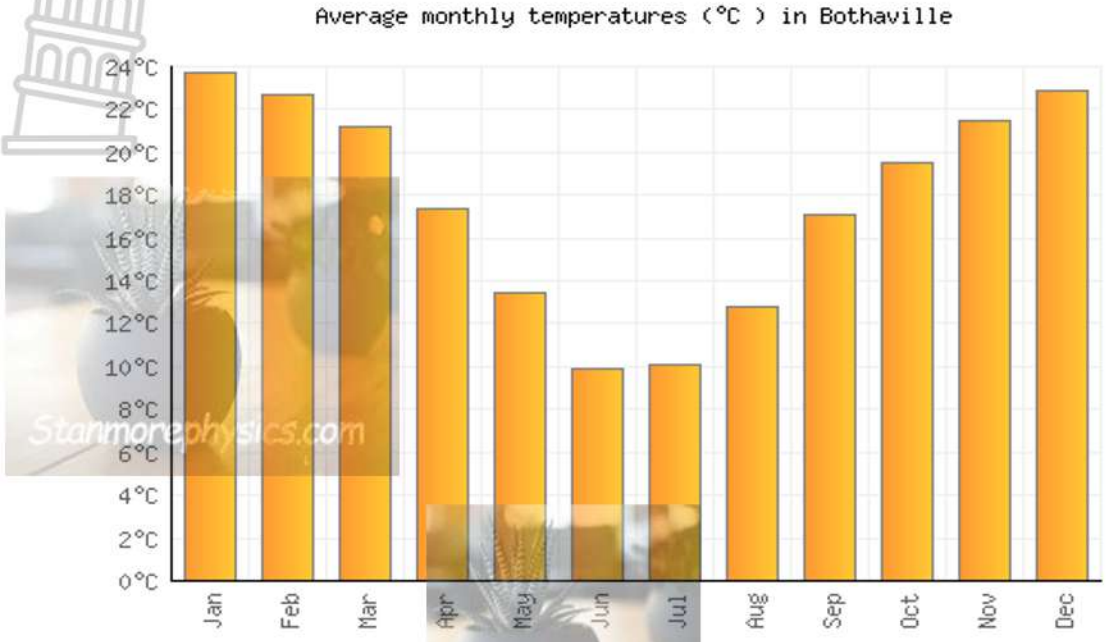
(c) What is the direction from the windpump in (Block **C1**) to the trigonometrical station **225** in (Block **A3**) (1 x 1) (1)

(d) Determine the true bearing from the windpump in (Block **C1**) to the trigonometrical station **225** in (Block **A3**) (1 x 1) (2)

[10]

3.2 MAP INTERPRETATION

The temperature graph below illustrates the average annual temperatures for Bothaville.



3.2.1 Identify the TWO coldest months the people of Bothaville will experience. (2 x 1) (2)

3.2.2 According to the background information what is the main agricultural product planted in this area

A wheat
B tomatoes
C maize
D potatoes (1 x 1) (1)

3.2.3 (a) Will the farmers of Bothaville consider planting their crops identified in QUESTION 3.2.2 during these two coldest months. Give ONE possible reason for your answer (1 + 1 x 2) (3)

(b) Explain ONE climatical danger farmers can experience during the summer season which might destroy their crops (1 x 2) (2)

Refer to the orthophoto map.

3.2.4 (a) Draw a free hand cross-section between spot height **1254** (Block **D5**) and spot height **1273** (Block **C3**) (1 x 1) (1)

(b) Indicate the position of the Valsrivier on the free hand cross section with an arrow. (1 x 1) (1)

(c) Discuss ONE advantage then Valsriver has for the golf course (1 x 2) (2)

[12]

3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Refer to block **D2** on the topographic map.

3.3.1 Vector data is data that consists of points, lines and polygons. Identify the following vector data in block **B3** that relates to drainage:

(a) A point feature (1 x 1) (1)

(b) A polygon feature (1 x 1) (1)

3.3.2 The orthophoto is an example of raster data. Give a reason for this. (1 x 1) (1)

Refer to the Silos (a tall tower on a farm to store grain) in block **C3** on the topographic map.

3.3.3 The capacity of the Silos is an example of (attribute/ spatial) data. (1 x 1) (1)

The orthophoto map is obtained by means of remote sensing.

3.4.1 Define *remote sensing*. (1 x 2) (2)

3.4.2 Explain how remote sensing could be useful in assisting the town planners of Bothaville with regards to the town expanding towards the Vals River. (1 x 2) (2)

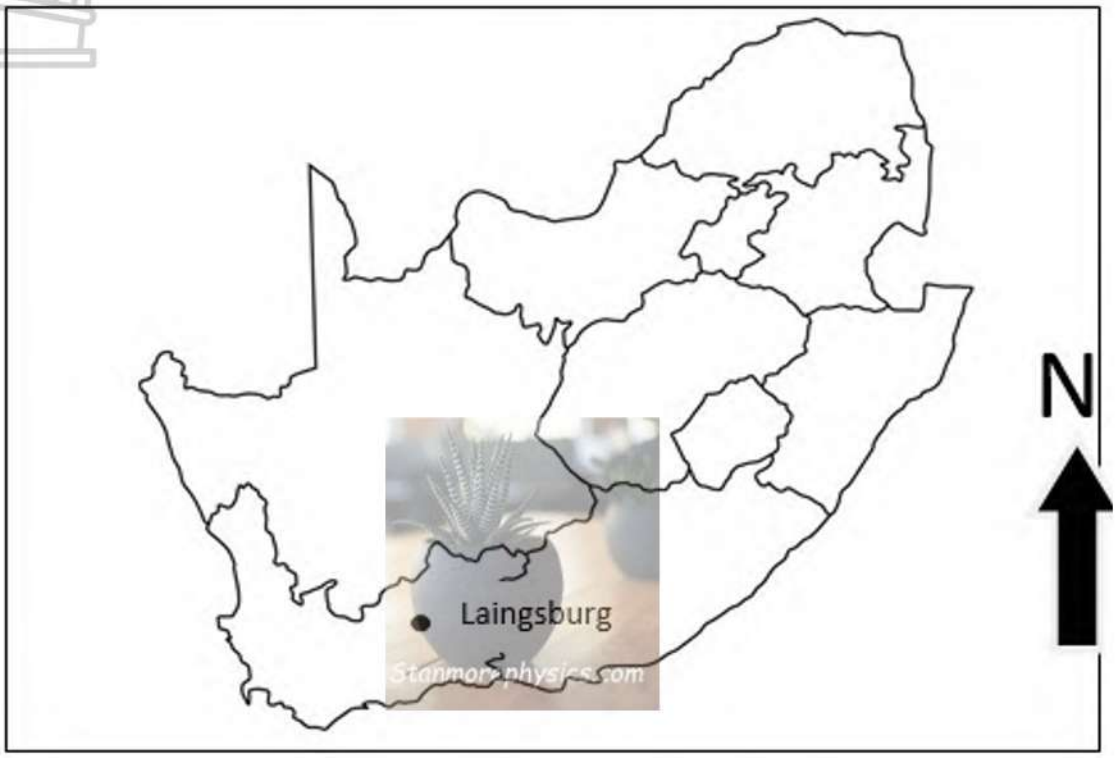
[8]

TOTAL FOR SECTION B: 30 MARKS

OPTION 2: LAINGSBURG

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

BACKGROUND INFORMATION ON LAINGSBURG



Coordinates: 33° 11' 42''S 20°51' 33''E

Laingsburg is situated along the N1 route, in the Western Cape province of South Africa. It is a relatively large agricultural town in the semi-arid Great Karoo. The towns rainfall is about 150mm per year. Although the Buffelsrivier runs right through the town, the river hardly has any water. Summers are extremely hot and dry, with temperatures exceeding 30°C. Winters are crisp to sometimes extremely cold, with snow occasionally occurring in the surrounding region. Laingsburg's economy is mainly based on farming of goats, sheep, lucerne (Alfalfa), fruit and vegetables

Adapted from https://www.laingsburg.gov.za

The following English terms and Afrikaans translations are shown on the topographic map.

ENGLISH	AFRIKAANS
Diggings	Uitgrawings
Golf Course	Gholfbaan
River	Rivier
Sewerage works	Rioolwerke
Golf driving range	Golf-dryfbaan
Nature Reserve	Natuurreservaat

3.1 MAP SKILLS AND CALCULATIONS

Various options are provided as possible answers to QUESTIONS 3.1.1 and 3.1.2. Choose the answer and write only the letter (A–D) next to the question numbers (3.1.1 and 3.1.2) in the ANSWER BOOK.

3.1.1 In the topographical map index 3320 BB, the **33** and **20** indicates …

A 33°N 20°W
B 33°S 20°E
C 33°W 20°E
D 33°E 00°S (1 x 1) (1)

3.1.2 The man-made polygon feature in block **C1** on the orthophoto map is a/an …

A golf course
B sewerage works
C recreational area
D dam (1 x 1) (1)

Refer to the topographic map

3.1.3 (a) Calculate the distance from **G** (arrow point) in (Block **A4**) to **F** (reservoir) in (Block **A5**) in meters (m) (2 x 1) (2)

Formula: **Actual distance = Map distance x Map scale**

(b) Calculate the area of the orthophoto map represented on the topographic map in red if the length is 3.9 cm and the breadth is 3.2 cm on the topographic m (3 x 1) (3)

Formula: Area = L x B

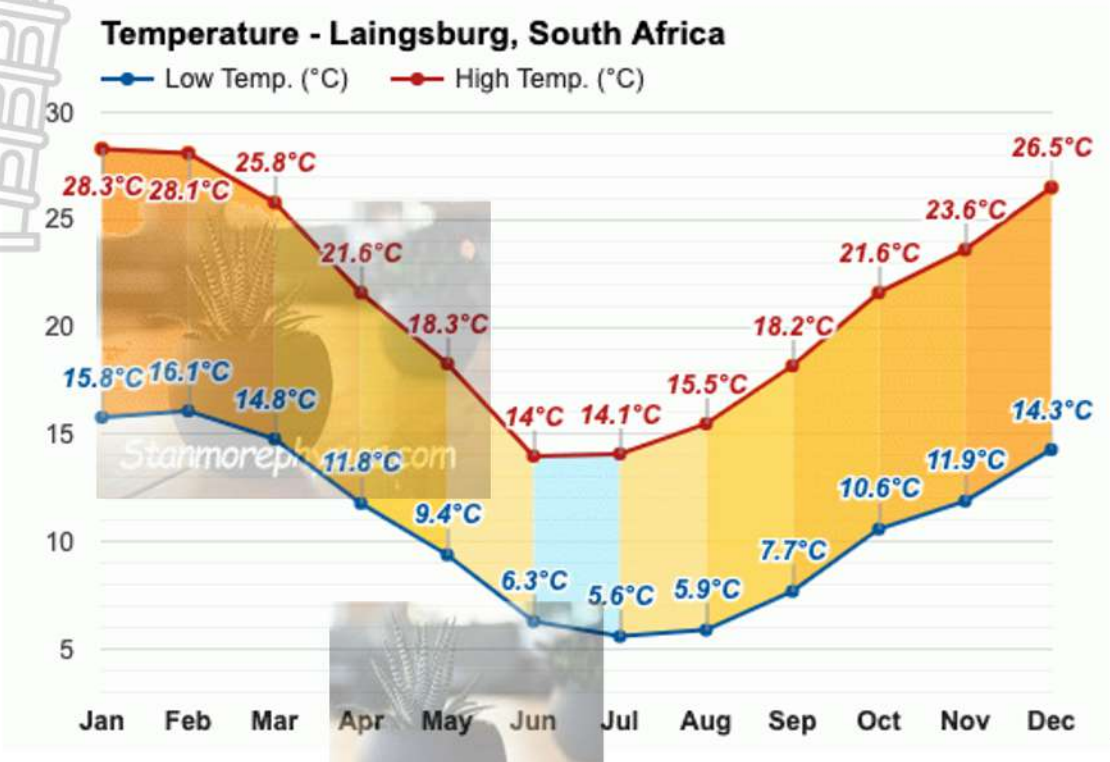
(c) What is the direction from the trigonometrical station 103 in (Block **D2**) to the reservoir at **F** in (Block **A5**) (1 x 1) (1)

(d) Determine the true bearing from the trigonometrical station **103** in (Block **D2**) to the reservoir at F in (Block **A5**) (1 x 2) (2)

[10]

3.2 MAP INTERPRETATION

The rainfall graph below illustrates the average annual rainfall for Laingsburg.



:

3.2.1 Identify the TWO coldest months the people of Lainsburg will experience. (2 x 1) (2)

3.2.2 According to the background information the economy of Lainsburg is based on …

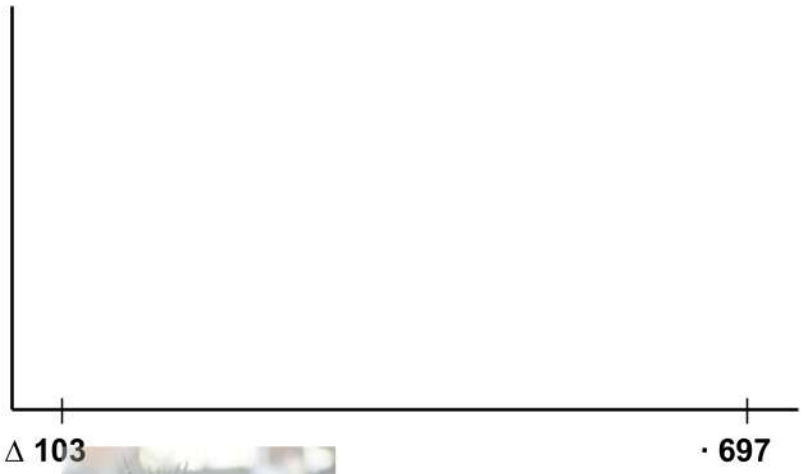
A tourism
B industries
C mining of gold
D goat and sheep farming (1 x 1) (1)

3.2.3 (a) Will maize farming be successful in the Laingsburg district. Discuss ONE reason for your answer. (1 + 1 x 2) (3)

(b) Explain ONE climatical danger farmers can experience during the winter season which might kill their livestock. (1 x 2) (2)

Refer to the orthophoto map.

3.2.4 (a) Draw a free hand cross-section between trigonometrical station 109 (Block **D2**) and spot height 697 (Block **E5**) (1 x 1) (1)



(b) Indicate the position of the Buffel river on the free hand cross section with an arrow. (1 x 1) (1)

(c) Discuss ONE advantage the Buffel river has for the golf course (1 x 2) (2)

[12]

3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Refer to block **C1** on the topographic map.

3.3.1 Vector data is data that consists of points, lines and polygons. Identify the following vector data in block **C1** that relates to drainage:

(a) A point feature (1 x 1) (1)

(b) A polygon feature (1 x 1) (1)

3.3.2 The orthophoto is an example of raster data. Give a reason for this. (1 x 1) (1)

Refer to the Hospital in block **C3** on the topographic map.

3.3.3 The number of beds available at the hospital is an example of (attribute/ spatial) data. (1 x 1) (1)

The orthophoto map is obtained by means of remote sensing.

3.4.1 Define *remote sensing*. (1 x 2) (2)

3.4.2 Explain how remote sensing could be useful in assisting the town planners of Laingsburg with regards to the town expanding towards the Buffelsrivier. (1 x 2) (2)

[8]

TOTAL FOR SECTION B: 30 MARKS

SEDIBENG WEST

TYPE OF TASK: FINAL EXAMINATION

PAPER 1

MARKING GUIDELINE

SUBJECT	:	GEOGRAPHY
GRADE	:	11
TIME	:	3 HOURS
TOTAL	:	150 MARKS
DATE OF IMPLEMENTATION	:	7 NOVEMBER 2024

This question paper consists of 10 pages.

1.1.1 **A (1)**

1.1.2 **C (1)**

1.1.3 **B (1)/ (i) and (iv)**

1.1.4 **C (1)/ (ii) and (iii)**

1.1.5 **A (1)/ (i) and (iii)**

1.1.6 **B (1)**

1.1.7 **A (1)**

1.1.8 **D (1)**

(8 x 1) **(8)**

1.2 Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, for example 1.1.8 latitude

1.2.1 The wind belt located between 60° and 90° north and south of the equator is referred to as the (polar easterly/westerly) wind belt.
Polar easterlies (1)

1.2.2 The (Polar/Hadley) cell is located between 0°and 30° north and south of the equator.
Hadley (1)

1.2.3 At the equator, there is surface (divergence/convergence) of air masses.
Convergence (1)

1.2.4 The (polar front/cold front) is associated with the convergence of cold and warm air masses.
Polar front (1)

1.2.5 The unit of measurement for atmospheric pressure is (hectopascal/ degrees celsius)
Hectopascal (1)

1.2.6 At the 30° north and south of the equator a surface (high pressure/low pressure) forms.
High pressure (1)

1.2.7 The formation of a Mid-latitude cyclone is usually associated with the (30°/60°) latitudes.
60 ˚(1)

(7 x 1) **(7)**

1.3

1.3.1 Match sketch A with either a summer or winter monsoon wind over the subcontinent of India. (1 x 1) (1)

Summer (1)

1.3.2 Identify the direction of the monsoon wind, according to the extract, that blows in sketch **A**. (1 x 1) (1)

Southwest (1)

1.3.3 Why does this wind that you identified in QUESTION 1.4.2 bring heavy rainfall to the Indian subcontinent? (1 x 1) (1)

Contains high amounts of moisture (1)

1.3.4 What positive physical (natural) impact will this heavy rainfall have on the Indian subcontinent? (2 x 2) (4)

Surface run-off would fill up rivers etc (2)
Infiltration increases water table (2)
Brings moisture to the soil (2)
Natural vegetation increases (2)
More grazing land available (2)
Increases biodiversity (2)
Revives habitat for ecosystems (2)
[ANY TWO]

Refer to sketch **B**.

1.3.5 Describe the weather conditions that would prevail over the Indian subcontinent in sketch **B**. (2 x 1) (2)

Temperatures drop / becomes colder (1)
Pressure increases (1)
Dry / little rain (1)
[ANY TWO]

1.3.6 Explain the negative economic impact that the subcontinent of India would experience if the conditions in sketch B are prolonged (continued). (3 x 2) (6)

A lack of rainfall would decrease the water supply available for agricultural crops (2)
There would be food insecurity as certain crops e.g. rice is a staple crop (2)
Food prices would increase as the country would have to import food (2)
There would be less agricultural products to export (2)
Foreign exchange would decrease (2)
Farmworkers would lose their jobs (2)
[ANY THREE]

[15]

1.4 Refer to the map and extract on desertification.

1.4.1 What is *desertification*? (1 x 2) (2)
A process where fertile land becomes arid (2)
[CONCEPT]

1.4.2 Identify the major desert on the map. (1 x 1) (1)
Sahara (1)

1.4.3 State ONE negative physical (natural) impact, according to the extract, of desertification. (1 x 1) (1)
Loss of biodiversity (1)
Loss of aquifers (1)
[ANY ONE]

1.4.4 Why is the Sahel regarded as a high-risk area? (1 x 1) (1)
It is on the edge of the Sahara Desert (1)

1.4.5 Explain the negative social impact that a drop in productivity will have on the people of Africa. (2 x 2) (4)
Smaller harvests especially in staple crops would lead to widespread famine/malnutrition (2)
There would be widespread poverty and deaths (2)
There would be job losses in farming and industry (2)
It would result in migration of people from rural to urban areas(2)
People would move to other countries creating conflict (2)
[ANY TWO]

1.4.6 Suggest measures that farmers could implement to reduce the spread of desertification. (3 x 2) (6)
Practice crop rotation (2)
Planting of trees (2)
Using organic fertilisers (2)
Practice contour ploughing (2)
Plant ground covers (2)
Allowing land to lie fallow (2)
[ANY THREE] **[15]**

1.5 Refer to figure below showing a synoptic weather map.

1.5.1 Determine the isobaric interval for this synoptic weather map (1 x 1) (1)
4 millibar / mb (1)

1.5.2 Identify the weather symbol labelled **E**. (1 x 1) (1)
Cold front (1)

1.5.3 State the season represented by this synoptic weather map (1 x 1) (1)
Winter (1)

1.5.4 Compare the pressure gradient at **A – B** with the pressure gradient at **C–D**. (2 x 2) (4)
At A – B the isobars are spaced far apart meaning the pressure gradient is weak therefore the windspeed is low (2)
At C – D the isobars are spaced close to each other meaning the pressure gradient is strong therefore the windspeed is very high (2)

1.5.5 In a paragraph of approximately EIGHT lines, explain the influence of the oceanic high-pressure systems on weather conditions along the east and west coast of South Africa. (4 x 2) (8)

South Africa is located at 30 South latitude line. (2)
It is therefore located in the subtropical high pressure belt (2)
Due to alternating areas of land and sea, pressure cells forms on the land and the ocean (2)
Therefore South Africa is surrounded by the South Atlantic High Pressure Cell on the west coast and the South Indian High Pressure Cell on the east coast (2)
A High Pressure cell is characterised by descending air, meaning no cloud formation (2)
South Africa is thus located in the belt characterised by descending air and therefore clear skies. (2)
[Any FOUR]

[15]
[60]

QUESTION 2: GEOMORPHOLOGY

2.1

2.1.1 ***Igneous rocks (1)***
2.1.2 ***Lopolith (1)***
2.1.3 ***Dome (1)***
2.1.4 ***Mesa (1)***
2.1.5 ***Batholith (1)***
2.1.6 ***Laccolith (1)***
2.1.7 ***Dome (1)***

(7 x 1) (7)

2.2 2.2.1 ***Z / Canyon (1)***

2.2.2 ***Z / Mesa (1)***

2.2.3 ***Z / Butte (1)***

2.2.4 ***Y / Conical hill (1)***

2.2.5 ***Z / Plateau (1)***

2.2.6 ***Y / Caprock (1)***

2.2.7 ***Y / Karoo landscape (1)***

2.2.8 ***Z / Parallel retreat (1)***

(8 x 1) (8)

2.3

2.3.1 Comment on the height of the topography evident in the sketch. (1 x 1) (1)

The original height remains the same (1)

2.3.2 Provide evidence from the sketch for your answer to QUESTION 2.3.1 (1 x 1) (1)

Resistant cap rock (1)

2.3.3 The topography above is (uniformly/not uniformly) resistant to erosion. (1 x 1) (1)

Not uniformly (1)

2.3.4 Explain TWO ways how do canyons form? (2 x 2) (4)

Steep-sided valley with rocks vary in resistance to erosion (2)
Rivers incise into joints in rocks (2)
Back wasting widens the joints (2)
Resistant layers form from vertical cliffs and softer rock form gentle
slopes (2)
[ANY TWO]

2.3.5 Explain how the elements of the Karoo landscape evident in the sketch will form from a canyon landscape. (2 x 2) (4)

Mesas form from a plateau that is reduced in size by backwasting (2)
Continuing erosion (backwasting) reduces the size of the mesa to form a butte (2)

2.3.6 How can the topography in the sketch associated with horizontally layered rocks be utilised economically by people? (2 x 2) (4)

The impressive scenery associated with canyons can be used as a tourist attraction (2)
Canyons can be utilised for recreational activity (accept examples) (2)
The pediplain below canyons, mesas and buttes can be used for livestock farming (2)

[15]

2.4

2.4.1 Identify the landforms associated with massive igneous rocks in photo A and photo B. (2 x 1) (2)

A – tors (1)
B – granite dome (1)

2.4.2 Name ONE characteristic of massive igneous rocks that is evident in the sketch. (1 x 1) (1)

Rocks have no strata/bedding planes (1)

2.4.3 From what igneous intrusions do the landforms in photo A and photo B originate? (2 x 1) (2)

A – laccoliths (1)
B – batholith (1)

2.4.4 How are these landforms in photo A and photo B exposed on the earth's surface? (1 x 2) (2)

Erosion of overlying strata/material (2)

2.4.5 In a paragraph of approximately EIGHT lines, explain the role of weathering in the formation of these two landforms. (4 x 2) (8)

Tors
Water seeps into joints of igneous rocks underneath the earth's surface (2)
This causes chemical weathering to take place (2)
Chemical weathering causes the rock to break into rectangular blocks (2)

Granite domes
Once the dome is exposed the outer layers of rock are exposed to expanding and contracting (2)
Exfoliation a type of mechanical weathering takes place (2)
Peeling of rock layers take place due to expansion and contracting (2)
[ANY FOUR]

[15]

2.5

2.5.1 How does the photograph depict a landslide? (1 x 1) (1)
A large mass of land has broken loose and plunged down a slope (1)

2.5.2 According to the article, what is the main cause of landslides in the greater eThekwini region. (1 x 1) (1)
Geology of the area (1)

2.5.3 What climatic evidence in the article suggests that the eThekwini region receives high rainfall? (1 x 1) (1)
'the region is subtropical' (1)

2.5.4 What role did heavy rainfall play in the development of landslides? (2 x 2) (4)
Water pressure pushes particles apart reducing their strength (2)
Some soils like clays are more slippery (2)
Slopes become unstable causing masses of land to break off (2)
[ANY TWO]

2.5.5 Account for the negative social impact of landslides in the region. (2 x 2) (4)
Collapsing land would lead to death and injury to people (2)
Property damage and loss of homes (2)
Destruction of infrastructure (accept examples) (2)
Loss of jobs (2)
Interruption of basic services (accept examples) (2)
[ANY TWO]

2.5.6 Suggest strategies that the municipality of eThekwini could adopt to minimise the effects of landslides. (2 x 2) (4)
Careful planning and management needed when making use of slopes (2)
Development in landslide-prone areas must be restricted (2)
Regrade slopes (2)
Reduce deforestation on slopes (2)
Provide adequate drainage on slopes (2)

Plant vegetation covers on slopes (2)
[ANY TWO]

[15]
[60]

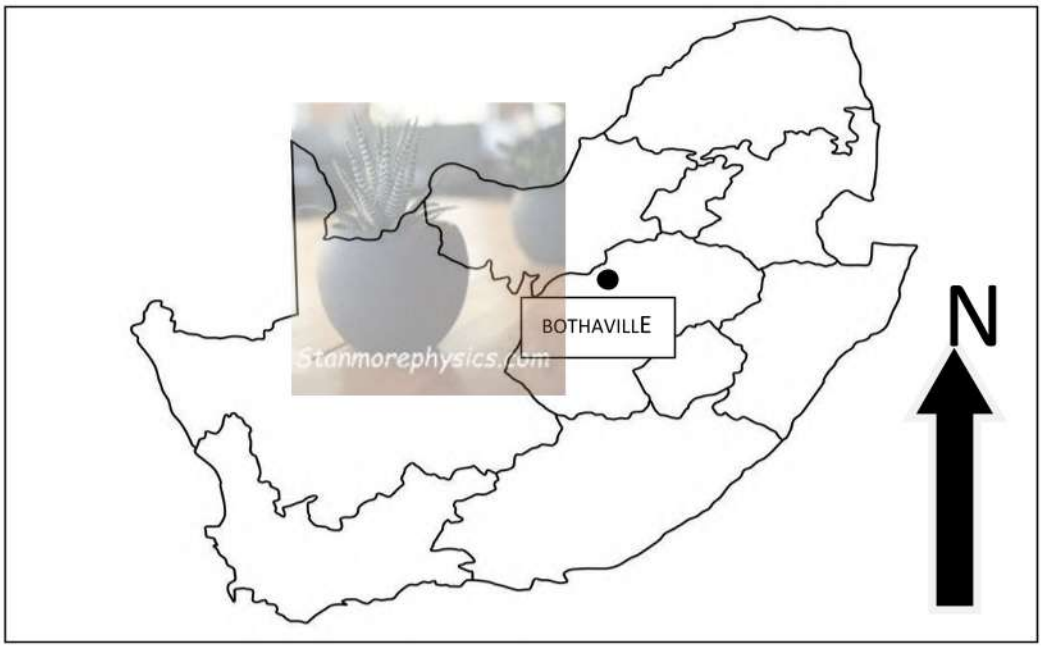
OPTION 1

SECTION B:

LEARNERS NEED TO CHOOSE WHICH MAP WORK SECTION THEY HAVE TO DO, ACCORDING TO THE MAP SUPPLIED BY THE SCHOOL.

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

BACKGROUND INFORMATION ON BOTHAVILLE



Coordinates: 27°37'40"S, 26°62'00"E

Bothaville is situated in the north-western parts of the Free State Province. It is situated 60 km east of the Vaal, on the bank of its Vals River tributary. The town of Bothaville is considered to be one of the richest agricultural districts in the country. It forms a key pillar in the so-called maize triangle as the heartland of South Africa's maize producing region. The district of Bothaville is also a major producer of other grain such as sunflower seeds, sorghum, peanuts, etc., and this serves as the major reason why Bothaville has become a bustling rural town, with a lively business sector. The town is officially known as the Maize Capital of South Africa.
[Source: https://web.archive.org/web/20100516143452/http://www.bothavillemaizecapital.co.za/]

The following English terms and their Afrikaans translations are shown on the topographic map.

ENGLISH	AFRIKAANS
Water purification plant	Water suiweringsaanleg
Sewage works	Rioolwerke
Weir	Keerwal
Golf course	Gholfbaan
Landing strip	Landingstrook

3.1 MAP SKILLS AND CALCULATIONS

Various options are provided as possible answers to QUESTIONS 3.1.1 and 3.1.2. Choose the answer and write only the letter (A–D) next to the question numbers (3.1.1 and 3.1.2) in the ANSWER BOOK.

3.1.1 In the topographical map index **2726 BC**, the **27** and **26** indicates …

A 27°N 26°W
B 27°S 26°E (1)
C 27°W 26°E
D 27°E 26°S (1 x 1) (1)

3.1.2 The man-made polygon features in block **E3** on the orthophoto map is a/an …

A Dam (1)
B golf coarse
C excavations
D cemetary (1 x 1) (1)

3.1.3 Refer to the topographical map.

(a) Calculate the distance of the landing strip in at **F** in (Block **C3** and **B3/4)** in meters (m) (2 x 1) (2)

Formula: **Actual distance = Map distance x Map scale**

= 2.4 cm(1) **x 500**

= 1200 m(1)

(b) Calculate the area of the orthophoto map represented on the topographic map in red if the length is 3.9 cm and the breadth is 3.2 cm on the topographic in km²

(3 x 1) (3)

Formula: Area = L x B
= (3.9 cm x 0.5) x (3.2 cm x 0.5)
= 1.95 km (1) x 1.6 km (1)
= 3.12 km² (1)

(c) What is the direction from the windpump in (Block **C1**) to the trigonometrical station **225** in (Block **A3**) (1 x 1) (1)

- Northeast (1)

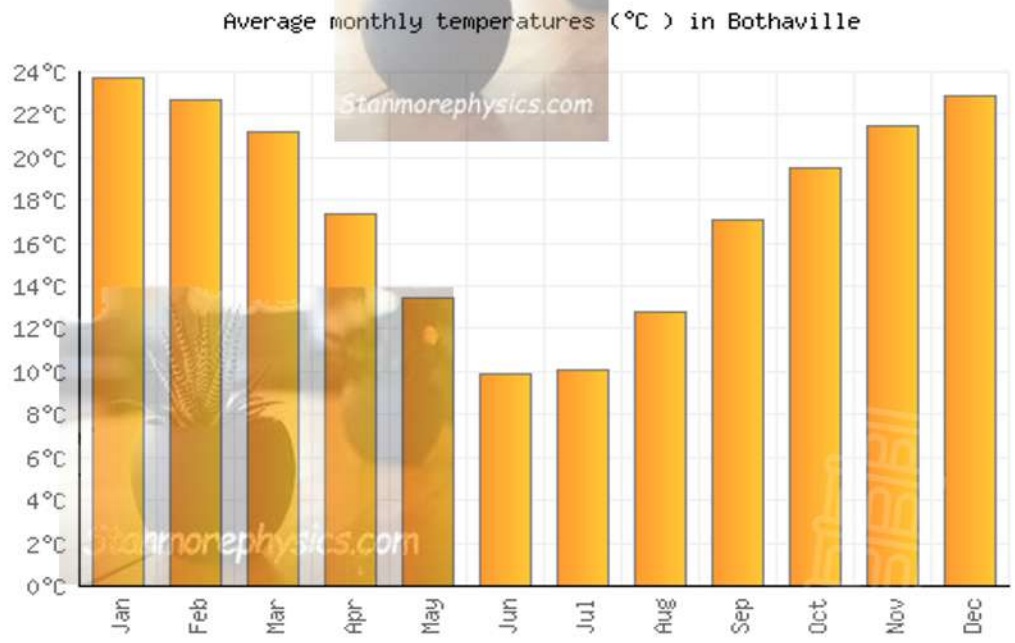
(d) Determine the true bearing from the windpump in (Block **C1**) to the trigonometrical station **225** in (Block **A3**) (1 x 1) (2)

- 49º Range (48º - 50º)

[10]

3.2 MAP INTERPRETATION

The temperature graph below illustrates the average annual temperatures for Bothaville.



3.2.1 Identify the TWO coldest months the people of Bothaville will experience. (2 x 1) (2)

- June(1)
- July(1)

3.2.2 According to the background information what is the main agricultural product planted in this area

A wheat
B tomatoes
C maize (1)
D potatoes (1 x 1) (1)

3.2.3 (a) Will the farmers of Bothaville consider planting maize identified in QUESTION 3.2.2 during these two coldest months. Give ONE possible reason for your answer (1 + 1 x 2) (3)

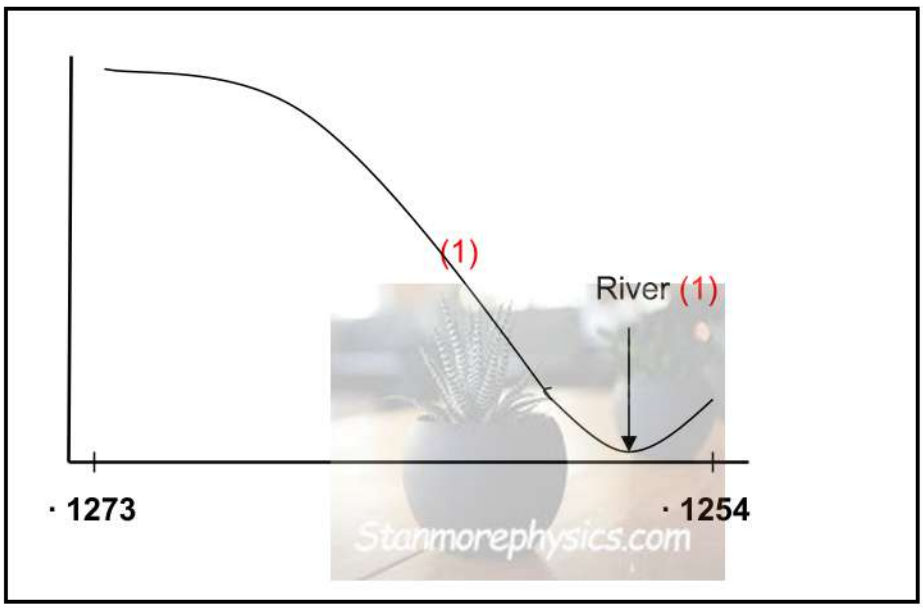
- No (1)
- maize cannot withstand cold conditions (2)
- maize needs water to grow and little rainfall (2) during these seasons (2)

(b) Explain ONE climatical danger farmers can experience during the summer season which might destroy their crops (1 x 2) (2)

- Hail can destroy crops (2)
- Too much rain can cause the crops to die (2)
- Lightning can cause fire to crops (2)
- Any One

Refer to the orthophoto map.

3.2.4 (a) Draw a free hand cross-section between spot height **1254** (Block **D5**) and spot height **1273** (Block **C3**) (1 x 1) (1)



(b) Indicate the position of the Valsrivier on the free hand cross section with an arrow. (1 x 1) (1)

(c) Discuss ONE advantage then Valsriver has for the golf course (1 x 2) (2)

- Irrigation for golf coarse (2)

[12]

3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Refer to block **D2** on the topographic map.

3.3.1 Vector data is data that consists of points, lines and polygons. Identify the following vector data in block **B3** that relates to drainage:

(a) A point feature (1 x 1) (1)

- Reservoir (1)
- Water tower (1)
- Spot height 1302.1 (1)
- Any One

(b) A polygon feature (1 x 1) (1)

- Excavations (1)
- Cemetery (1)
- Cultivated land(1)
- Any One

3.3.2 The orthophoto is an example of raster data. Give a reason for this. (1 x 1) (1)

- It consist of pixels (1)

Refer to the Silos (a tall tower on a farm to store grain) in block **C3** on the topographic map.

3.3.3 The capacity of the Silos is an example of (attribute/ spatial) data. (1 x 1) (1)

- Attribute (1)

The orthophoto map is obtained by means of remote sensing.

3.4.1 Define *remote sensing*. (1 x 2) (2)

- Collection of data by a recording device and is not in direct contact of the area (2)

3.4.2 Explain how remote sensing could be useful in assisting the town planners of Bothaville with regards to the town expanding towards the Vals River. (1 x 2) (2)

- Allows coverage of very large areas and identify potential Expansion towards the Vals River (2)
- Can access inaccessible areas. (2) .
- Data can easily be processed and analysed fast using a computer. (2)
- Cheap and fast method of collecting data of large areas. (2)
- Indicate floodlines (2)
- Indicate buffer zones (2)

[Any one]

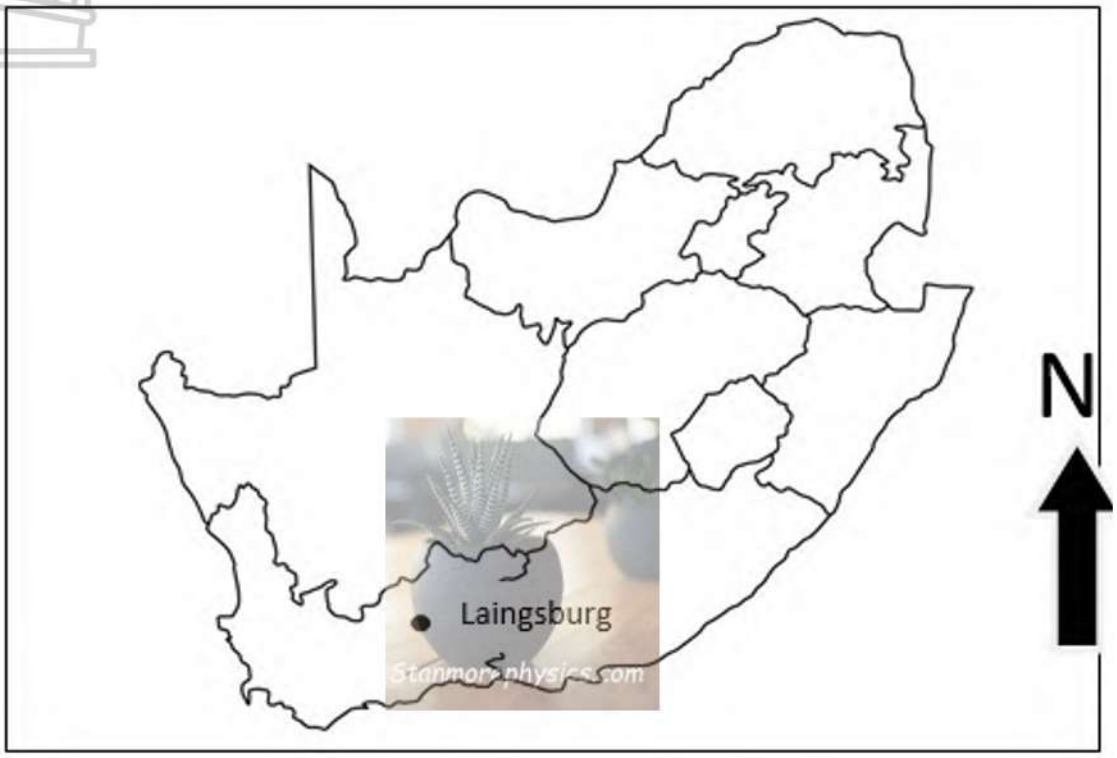
[8]

TOTAL FOR SECTION B: 30 MARKS

OPTION 2: LAINGSBURG

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

BACKGROUND INFORMATION ON LAINGSBURG



Coordinates: 33° 11' 42''S 20°51' 33''E

Laingsburg is situated along the N1 route, in the Western Cape province of South Africa. It is a relatively large agricultural town in the semi-arid Great Karoo. The towns rainfall is about 150mm per year. Although the Buffelsrivier runs right through the town, the river hardly has any water. Summers are extremely hot and dry, with temperatures exceeding 30°C. Winters are crisp to sometimes extremely cold, with snow occasionally occurring in the surrounding region. Laingsburg's economy is mainly based on farming of goats, sheep, lucerne (Alfalfa), fruit and vegetables

Adapted from https://www.laingsburg.gov.za

The following English terms and Afrikaans translations are shown on the topographic map.

ENGLISH	AFRIKAANS
Diggings	Uitgrawings
Golf Course	Gholfbaan
River	Rivier
Sewerage works	Rioolwerke
Golf driving range	Golf-dryfbaan
Nature Reserve	Natuurreservaat

3.1 MAP SKILLS AND CALCULATIONS

Various options are provided as possible answers to QUESTIONS 3.1.1 and 3.1.2. Choose the answer and write only the letter (A–D) next to the question numbers (3.1.1 and 3.1.2) in the ANSWER BOOK.

3.1.1 In the topographical map index 3320 BB, the **33** and **20** indicates …

A 33°N 20°W
B 33°S 20°E (1)
C 33°W 20°E
D 33°E 00°S (1 x 1) (1)

3.1.2 The man-made polygon feature in block **C1** on the orthophoto map is a/an …

A golf course
B sewerage works (1)
C recreational area
D dam (1 x 1) (1)

Refer to the topographic map

3.1.3 (a) Calculate the distance from **G** (arrow point) in (Block **A4**) to **F** (reservoir) in (Block **A5)** in meters (m) (2 x 1) (2)

Formula: **Actual distance = Map distance x Map scale**

= 3.6 cm (1)x 500M
= 503.6 m(1)

(b) Calculate the area of the orthophoto map represented on the topographic map in red if the length is 3.9 cm and the breadth is 3.2 cm on the topographic km² (3 x 1) (3)

Formula: Area = L x B
= 3.9 cm x 0.5km x 3.2 cm x 0.5
= 1.95 km(1) x 1.6 km(1)
= 3.12 km² (1)

(c) What is the direction from the trigonometrical station 103 in (Block **D2**) to the reservoir at **F** in (Block **A5**) (1 x 1) (1)

- North east (1)

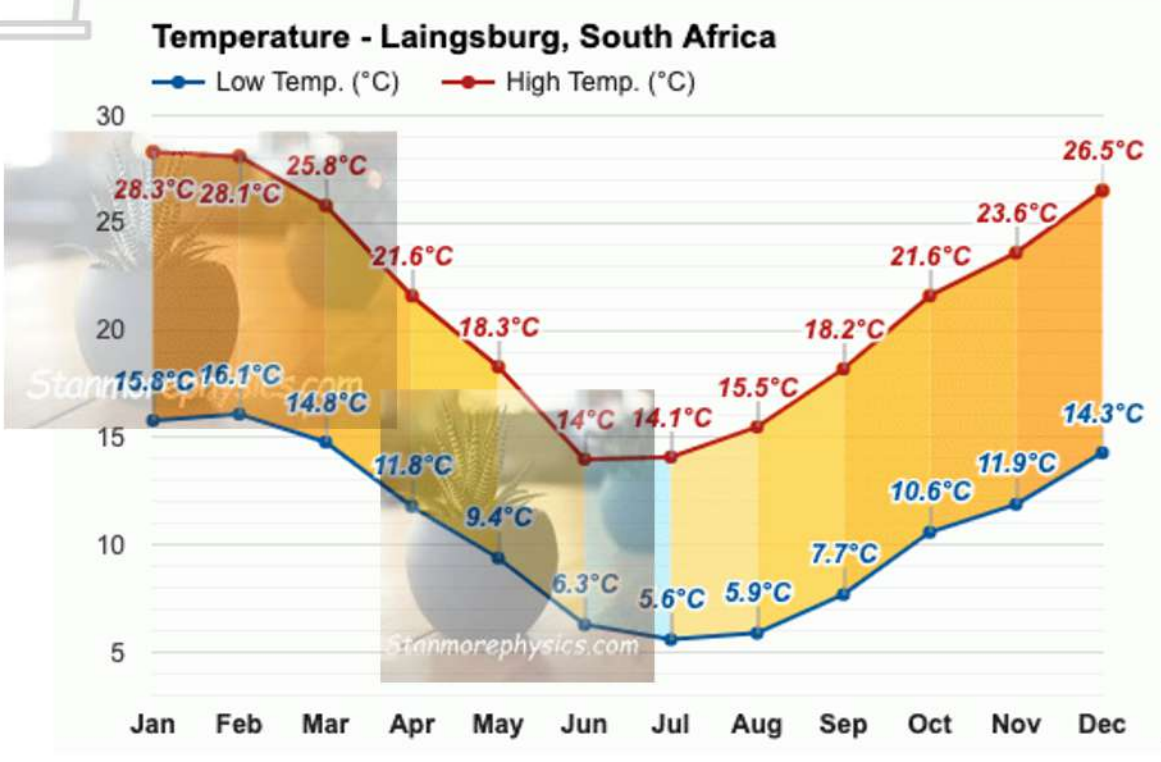
(d) Determine the true bearing from the trigonometrical station **103** in (Block **D2**) to the reservoir at F in (Block **A5**) (1 x 2) (2)

50 º Range (49º - 51º) (2)

[10]

3.2 MAP INTERPRETATION

The rainfall graph below illustrates the average annual rainfall for Laingsburg.



:

3.2.1 Identify the coldest and warmest months the people of Lainsburg will experience. (2 x 1) (2)

- Coldest – July (1)
- Warmest - January(1)

3.2.2 According to the background information the economy of Lainsburg is based on …

A tourism
B industries
C mining of gold
D goat and sheep farming (1) (1 x 1) (1)

3.2.3 (a) Will maize farming be successful in the Laingsburg district. Discuss ONE reason for your answer. (1 + 1 x 2) (3)

- No (1)
- Average rainfall too low (2)

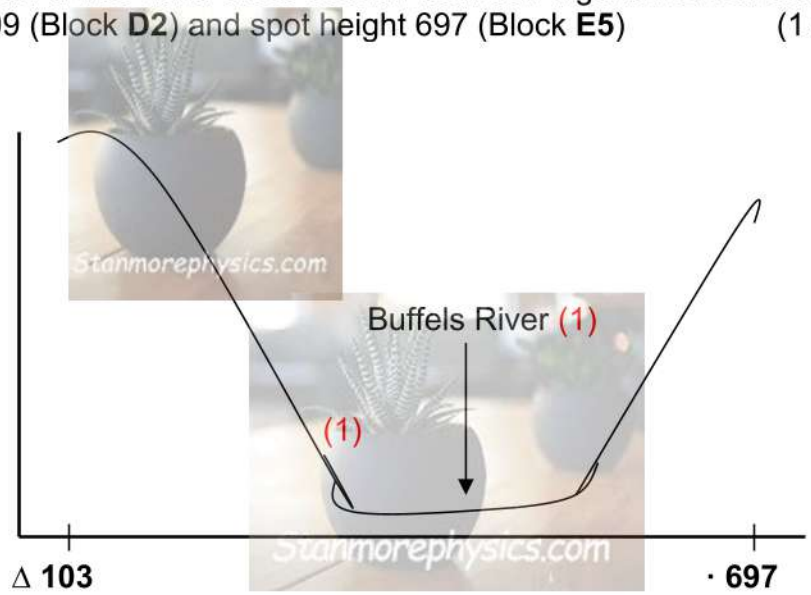
- Dry area (2)
- Soil not fertile enough (2)
- (a mark for "NO" and Two marks for the any ONE reason)

(b) Explain ONE climatical danger farmers can experience during the winter season which might kill their livestock. (1 x 2) (2)

- Extreme cold (2)
- Snow (2)
- Any one

Refer to the orthophoto map.

3.2.4 (a) Draw a free hand cross-section between trigonometrical station 109 (Block **D2**) and spot height 697 (Block **E5**) (1 x 1) (1)



(b) Indicate the position of the Buffel river on the free hand cross section with an arrow. (1 x 1) (1)

(c) Discuss ONE advantage the Buffel river has for the golf course (1 x 2) (2)

- Irrigation for golf coarse (2)

[12]

3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Refer to block **C1** on the topographic map.

3.3.1 Vector data is data that consists of points, lines and polygons. Identify the following vector data in block **C1** that relates to drainage:

(a) A point feature (1 x 1) (1)

- Road (1)
- Reservoir (1)
- Dwellings (1)
- Any one

(b) A polygon feature (1 x 1) (1)

- Sewerage works (1)
- Diggings (1)
- Orchards (1)
- Any one

3.3.2 The orthophoto is an example of raster data. Give a reason for this.
Images in (clear) pixels (1) (1 x 1) (1)

Refer to the Hospital in block **C3** on the topographic map.

3.3.3 The number of beds available at the hospital is an example of (attribute/ spatial) data. (1 x 1) (1)

- Attribute (1)

The orthophoto map is obtained by means of remote sensing.

3.4.1 Define *remote sensing*. (1 x 2) (2)

- Collection of data by a recording device and is not in direct contact of the area (2)

3.4.2 Explain how remote sensing could be useful in assisting the town planners of Laingsburg with regards to the town expanding towards the Buffelsrivier. (1 x 2) (2)

- Allows coverage of very large areas and identify potential Expansion towards the Buffels River (2)
- Can access inaccessible areas. (2) .
- Data can easily be processed and analysed fast using a computer. (2)
- Cheap and fast method of collecting data of large areas. (2)
- Indicate floodlines (2)
- Indicate buffer zones (2)
- [Any one]

[8]

TOTAL FOR SECTION B: 30 MARKS