



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P1

NOVEMBER 2021

MARKS: 150

TIME: 3 hours

This question paper consists of 19 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS:

SECTION A:

QUESTION 1: Climate and Weather (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 between the subsections 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.
12. You may use a magnifying glass.
13. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

14. A 1 : 50 000 topographic map 2331CC PHALABORWA and a 1 : 10 000 orthophoto map 2331 CC 18 PHALABORWA (NORTH) are provided.
15. The area demarcated in RED/BLACK on the topographic map represents the area covered by the orthophoto map.
16. Show ALL calculations. Marks will be allocated for this.
17. You must hand in the topographic and the orthophoto map to the invigilator at the end of this examination session.

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

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, e.g. 1.1.9 D.

1.1.1 A mid-latitude cyclone occurs between ... north and south of the equator.

- A 5° and 25°
- B 30° and 60°
- C 0° and 5°
- D 60° and 90°

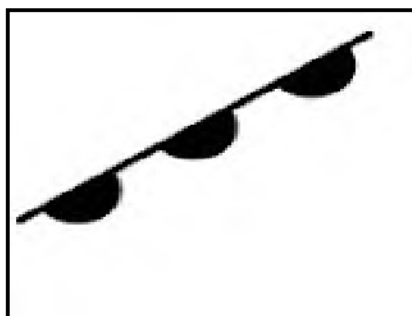
1.1.2 A mid-latitude cyclone is steered (driven) by the ...

- A easterlies.
- B polar easterlies.
- C trade winds.
- D westerlies.

1.1.3 The change in wind direction of the mid-latitude cyclone in the Southern Hemisphere is called ...

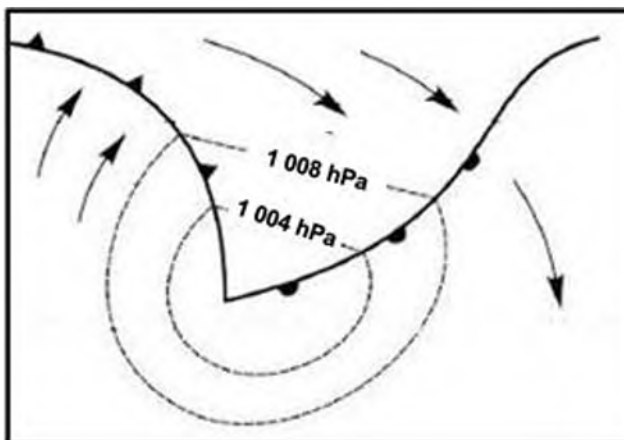
- A veering.
- B backing.
- C rotating.
- D converging.

1.1.4 The front below is a ... front.



- A cold
- B occluded
- C warm
- D stationary

1.1.5 The mid-latitude cyclone below is in the ... stage.



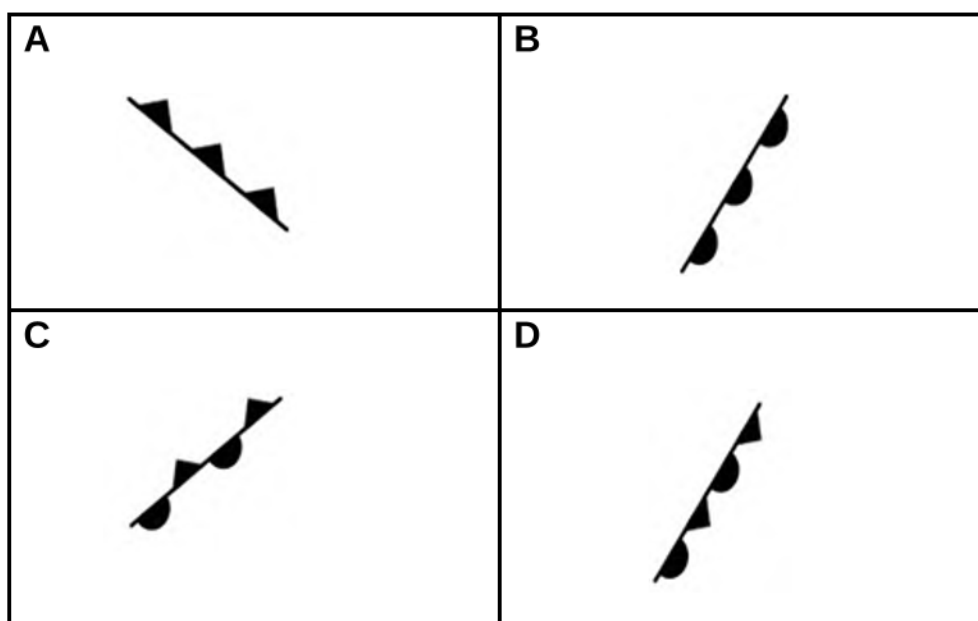
[Source: <https://www.google.com/search?q=mid-latitude>]

- A initial
- B wave
- C mature
- D occluded

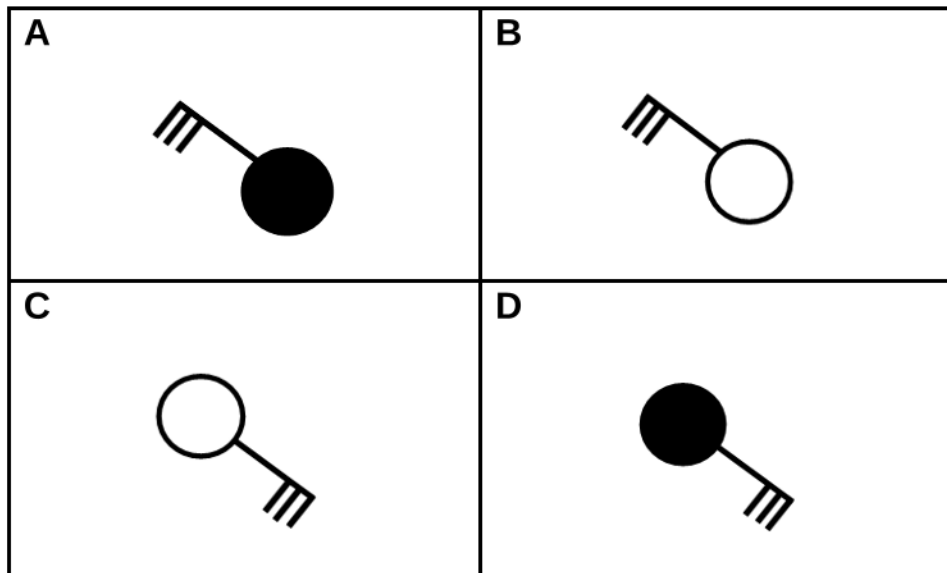
1.1.6 The conditions experienced behind a cold front are a/an ...

- A increase in pressure and decrease in temperature.
- B decrease in pressure and decrease in temperature.
- C increase in pressure and increase in temperature.
- D decrease in pressure and increase in temperature.

1.1.7 Which symbol below illustrates the merging of a cold and warm front?



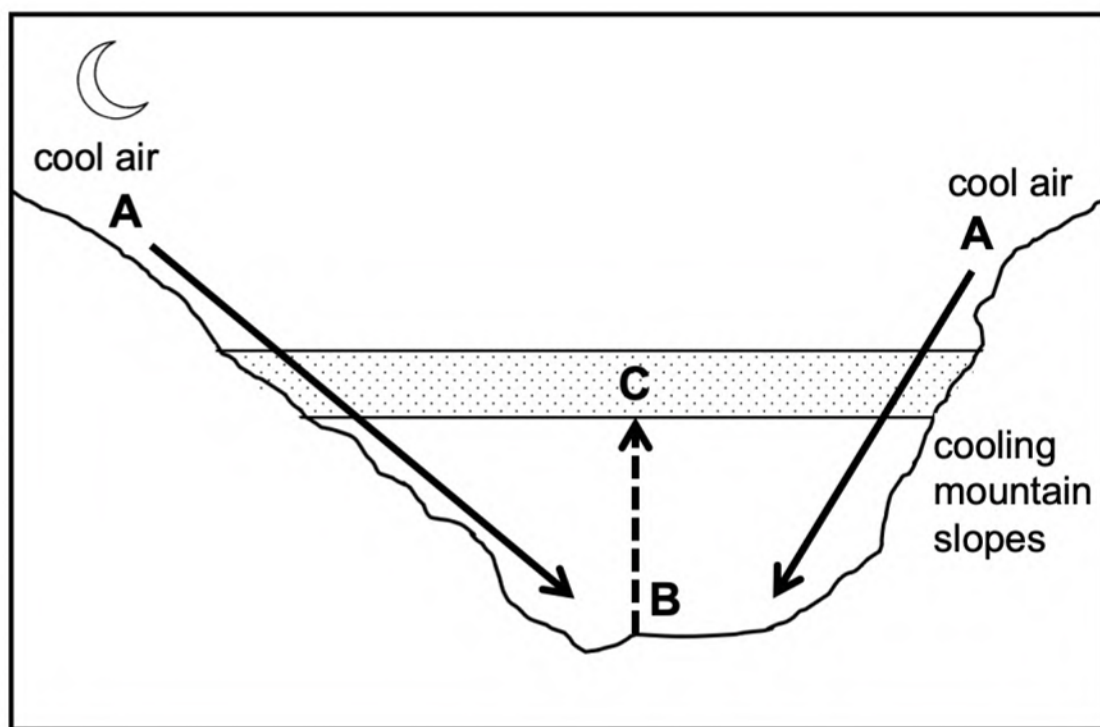
1.1.8 The station model generally associated with a cold front in the Southern Hemisphere:



(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 (1.2.1 to 1.2.7) in the ANSWER BOOK.



[Source: Examiner's own sketch]

1.2.1 Air at **A** cools because of (solar/terrestrial) radiation.

1.2.2 Downward movement of air along the valley slopes occurs during the (night/day).

1.2.3 Air movement from **A** to **B** results in a/an (anabatic/katabatic) wind.

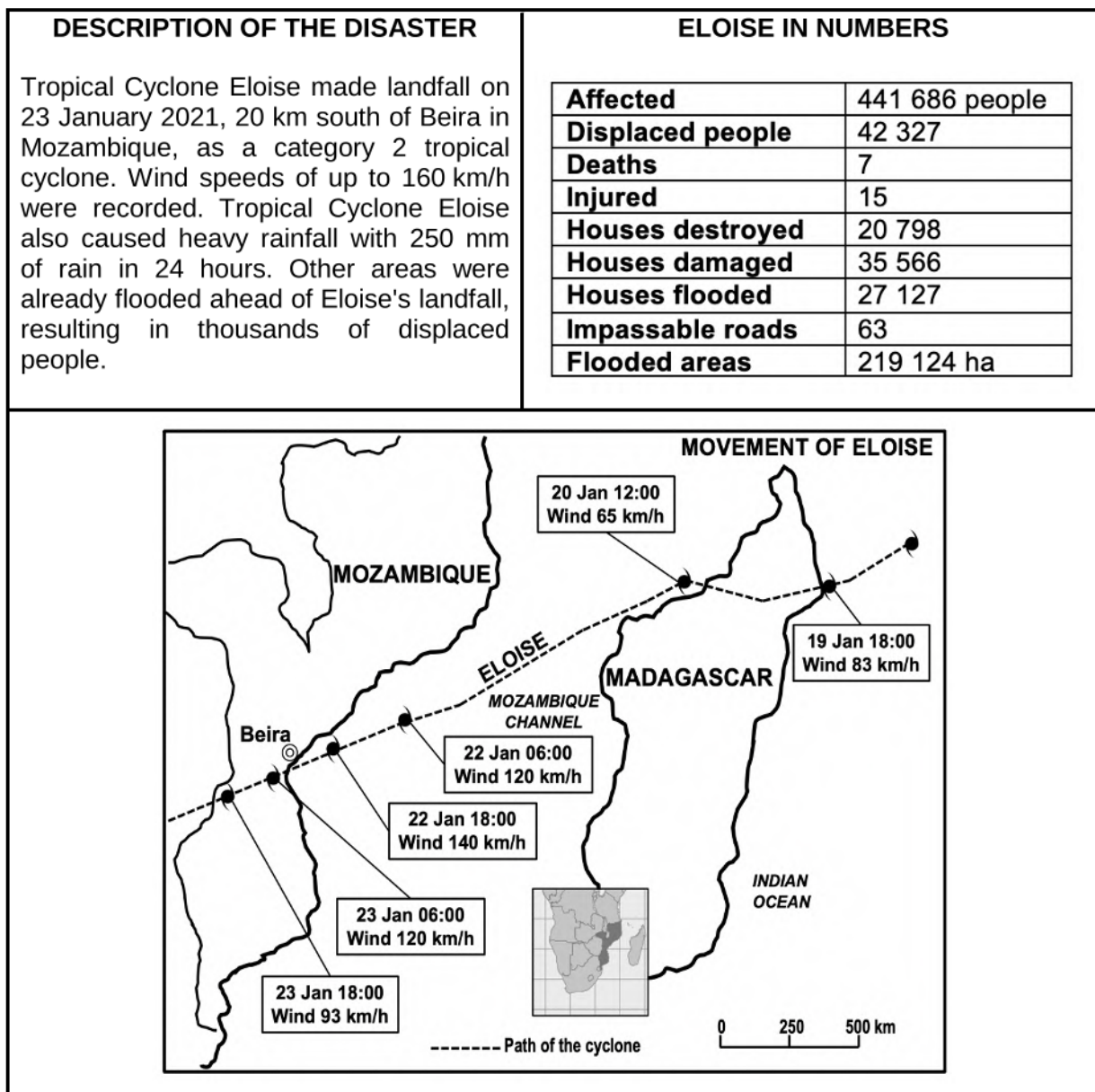
1.2.4 Dew point temperature drops to below freezing point at (**A/B**) at night.

1.2.5 Precipitation that forms at **B** when the dew point temperature drops below 0 °C is (frost/radiation fog).

1.2.6 Displaced air from the valley results in a/an (inversion layer/thermal belt) developing at **C**.

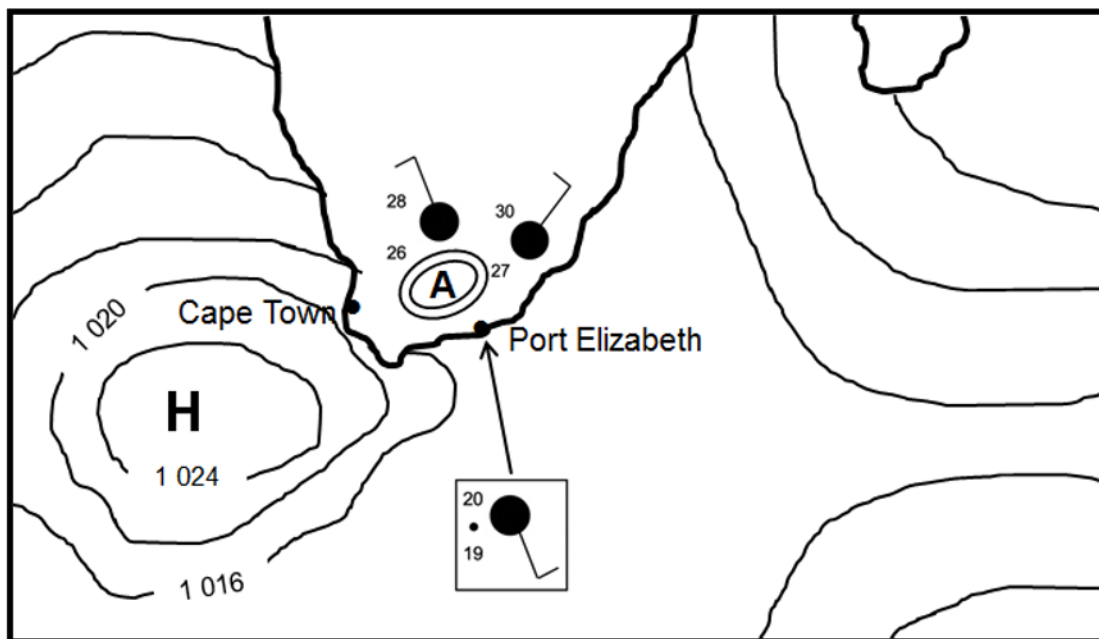
1.2.7 Layer **C** is more developed during the (day/night). (7 x 1) (7)

1.3 Refer to the infographic on Tropical Cyclone Eloise.



- 1.3.1 Give ONE piece of evidence in the infographic that the tropical cyclone is in the Southern Hemisphere. (1 x 1) (1)
- 1.3.2 State TWO weather conditions associated with tropical cyclones indicated in the infographic. (2 x 1) (2)
- 1.3.3 Give ONE reason for the decrease in wind speed from 19 January to 20 January 2021. (1 x 2) (2)
- 1.3.4 Account for the increase in wind speed of Tropical Cyclone Eloise from the 20 January to 22 January 2021. (2 x 2) (4)
- 1.3.5 According to the infographic the negative impact of Tropical Cyclone Eloise was devastating. Suggest THREE strategies that could be put in place to reduce this impact. (3 x 2) (6)

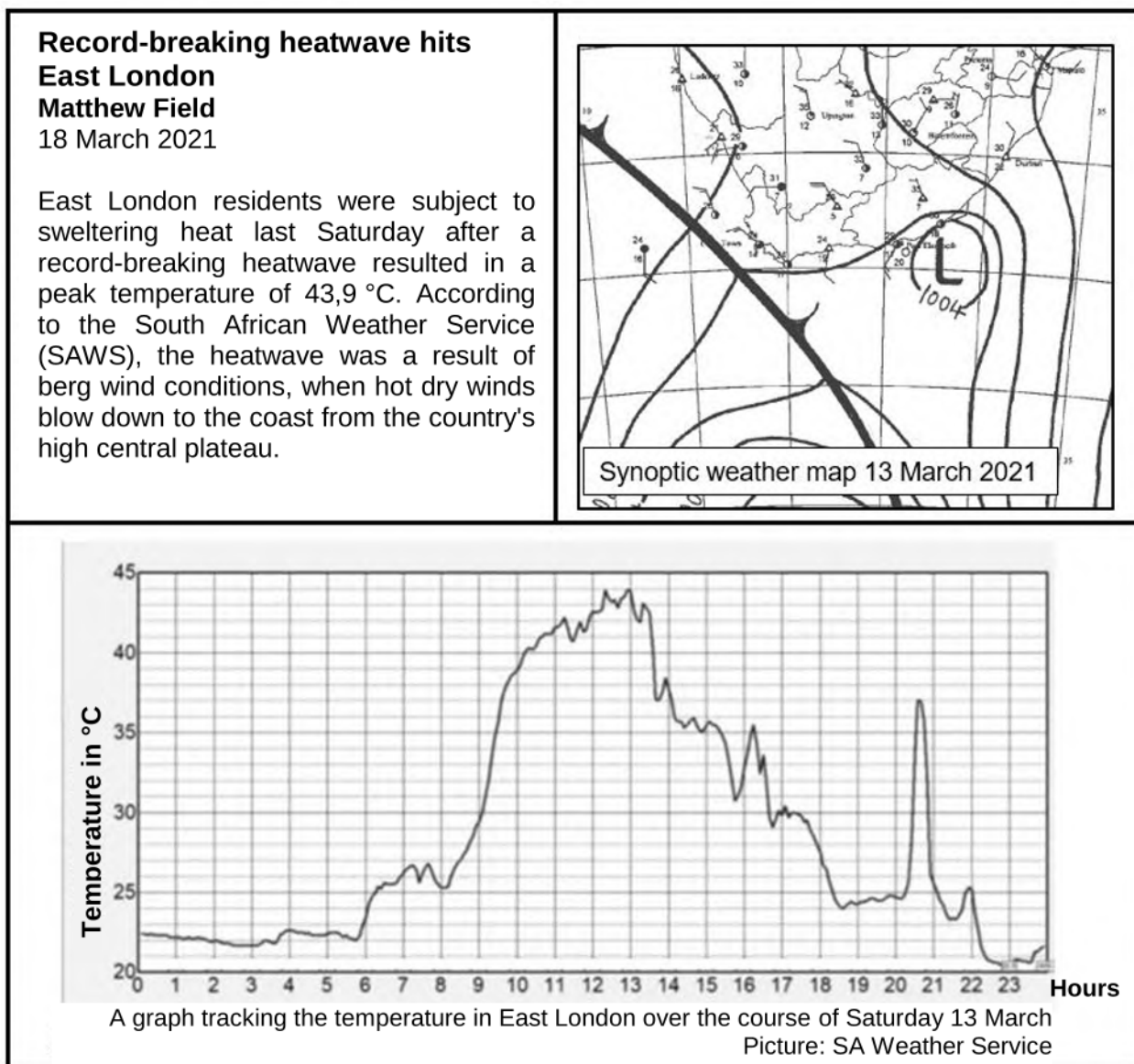
1.4 Refer to the South African synoptic weather map.



[Source: Examiner's own sketch]

- 1.4.1 Identify low-pressure system **A** on the synoptic weather map. (1 x 1) (1)
- 1.4.2 Give a reason for the formation of this low-pressure system over the interior. (1 x 2) (2)
- 1.4.3 Give evidence from the synoptic weather map that the South Atlantic high is ridging. (1 x 2) (2)
- 1.4.4 Why does the ridging of the South Atlantic high result in onshore winds? (2 x 2) (4)
- 1.4.5 Describe the weather conditions at Port Elizabeth as a result of the onshore winds. (3 x 2) (6)

1.5 Refer to the infographic on the South African berg wind.

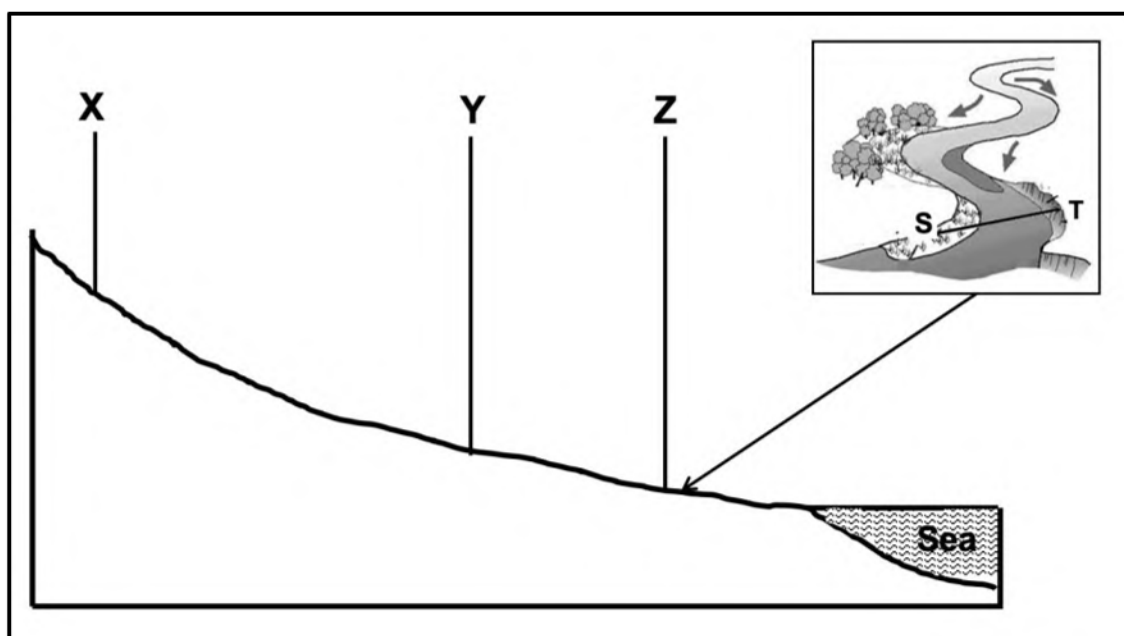


- 1.5.1 Name TWO pressure systems that are necessary for berg winds to develop. (2 x 1) (2)
- 1.5.2 Determine the highest temperature that was recorded on 13 March 2021. (1 x 1) (1)
- 1.5.3 What role did the escarpment play in increasing the temperature of the berg wind between 10:00 and 14:00? (2 x 2) (4)
- 1.5.4 In a paragraph of approximately EIGHT lines, explain the impact of berg wind conditions on the physical (natural) environment. (4 x 2) (8)
- [60]**

QUESTION 2: GEOMORPHOLOGY

- 2.1 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 (2.1.1 to 2.1.8) in the ANSWER BOOK, e.g. 2.1.9 D.

Points **X**, **Y** and **Z** shows the different stages (courses) from the source to the mouth of a river and the points **S-T** along the meander found at **Z**.



[Source: Examiner's own sketch]

- 2.1.1 The profile from the source to the mouth shows the ... of the river.

A volume
B length
C width
D depth

- 2.1.2 The stages (courses) represented by **X**, **Y** and **Z** are ...

A middle, upper, lower.
B lower, middle, upper.
C upper, middle, lower.
D upper, lower, middle.

- 2.1.3 ... describes the river valley at **X**.

A Wide and shallow
B Wide and deep
C Narrow and shallow
D Narrow and deep

2.1.4 At **Z** the river has a laminar flow due to a ... riverbed.

- A rough and uneven
- B steep and even
- C gently sloping and even
- D rocky (rock-filled)

2.1.5 Slope **T** on the meander is the ... slope.

- A slip-off
- B convex
- C undercut
- D gentle

2.1.6 Slope **S** on the meander is associated with a ...

- A steep gradient and deposition.
- B gentle gradient and erosion.
- C concave slope with erosion.
- D convex slope with deposition.

2.1.7 The narrowing of the neck in the meander will eventually form a/an ...

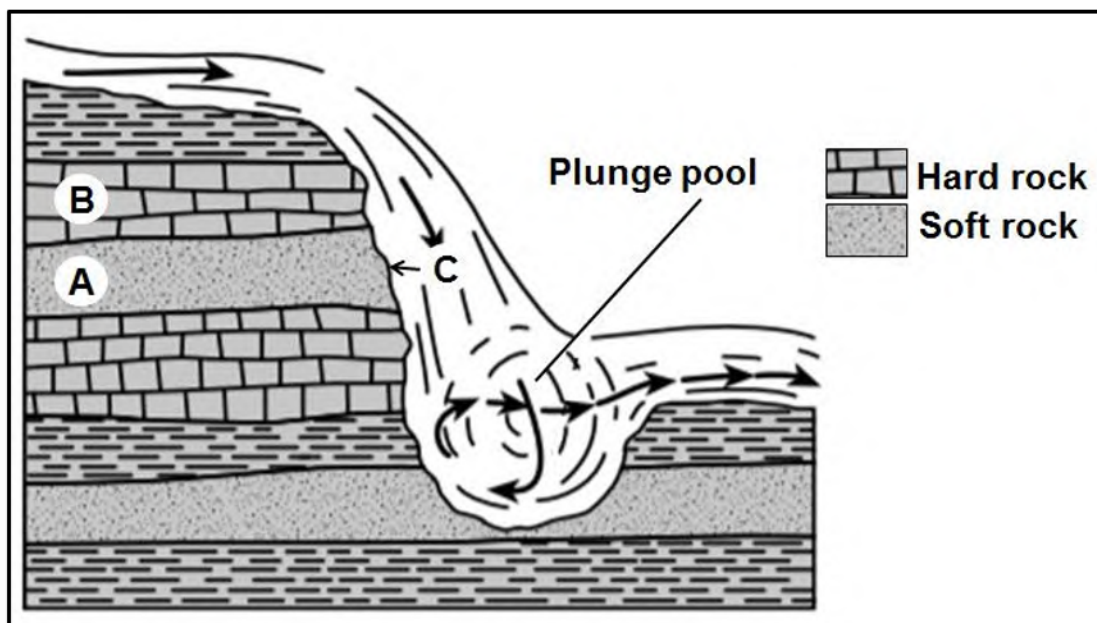
- A braided stream.
- B ox-bow lake.
- C flood plain.
- D river delta.

2.1.8 The meander will migrate ... on the floodplain.

- A upstream
- B laterally
- C downstream
- D headwards

(8 x 1) (8)

- 2.2 Refer to the sketch, which shows a waterfall with a plunge pool. Complete the statements in COLUMN A with the options in COLUMN B. Write only **X** or **Y** next to the question numbers (2.2.1 to 2.2.7) in the ANSWER BOOK, e.g. 2.2.8 Y.

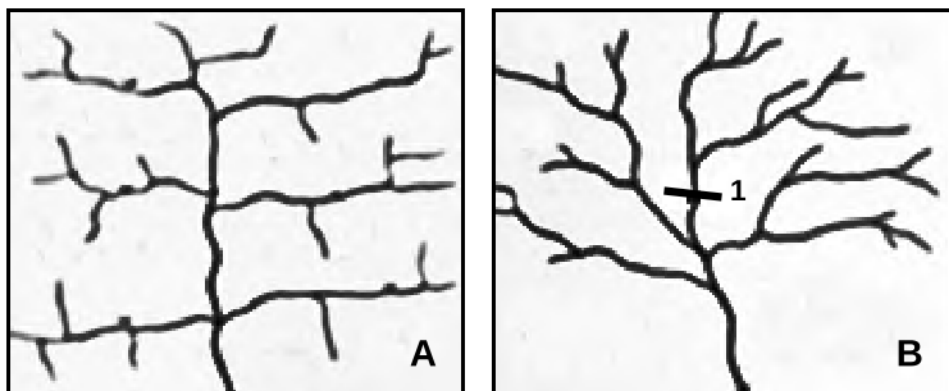


[Source: Examiner's own sketch]

COLUMN A	COLUMN B
2.2.1 Waterfalls form when ...	X: there are alternate layers of hard and soft rock. Y: there are only soft rocks.
2.2.2 Waterfalls are likely to be found in the ...	X: lower course. Y: upper course.
2.2.3 ... refers to the softer rock that erodes faster.	X: Rock type A Y: Rock type B
2.2.4 The plunge pool is formed by ...	X: deposition. Y: erosion.
2.2.5 When the softer rock at C erodes, it will cause ...	X: the rock at A to collapse into the plunge pool. Y: waterfalls to retreat downstream.
2.2.6 The retreat of the waterfall will result in the formation of a ...	X: gorge. Y: rapid.
2.2.7 An advantage of a waterfall is ...	X: hydro-electricity. Y: promoting water transport.

(7 x 1) (7)

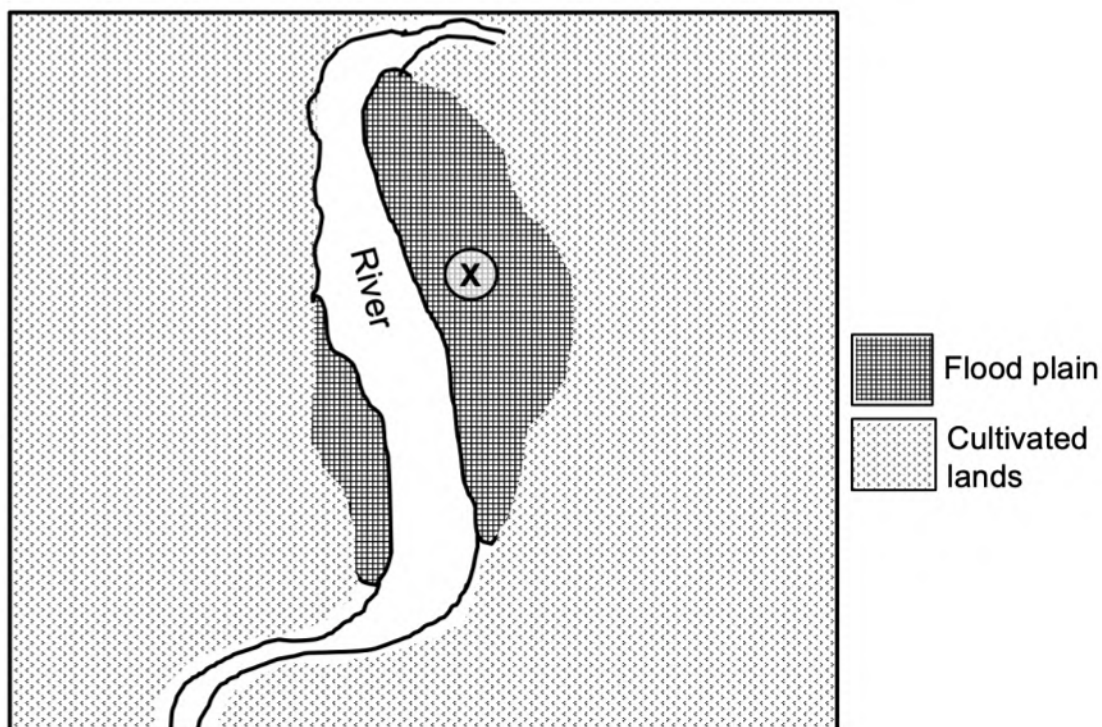
2.3 Refer to the diagrams showing drainage patterns.



[Adapted from <https://www.google.com/search?q=trellis+and+dendritic+drainage+patterns>]

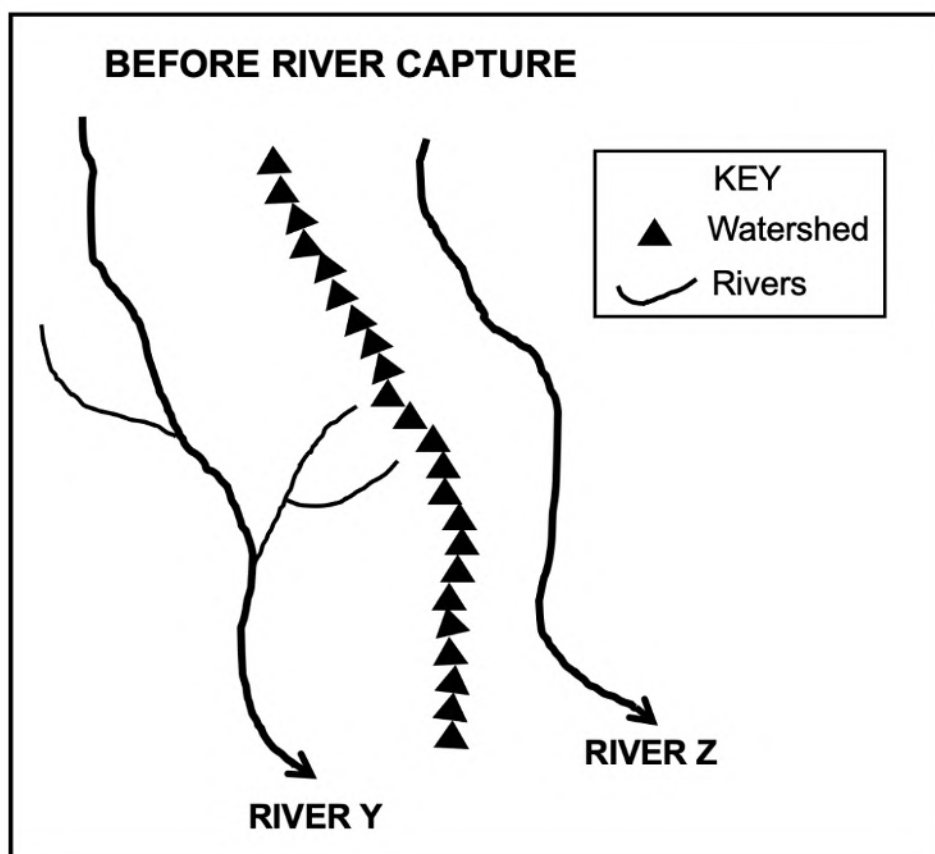
- 2.3.1 Identify drainage patterns **A** and **B**. (2 x 1) (2)
- 2.3.2 Differentiate between the underlying rock structure of drainage patterns **A** and **B** respectively. (2 x 2) (4)
- 2.3.3 Why are the tributaries of the main stream parallel to each other in drainage pattern **A**? (1 x 2) (2)
- 2.3.4 Determine the stream order at point **1** in drainage pattern **B**. (1 x 2) (2)
- 2.3.5 Choose the CORRECT word between brackets to make the statement TRUE.
- The higher the stream order, the (higher/lower) the drainage density. (1 x 1) (1)
- 2.3.6 Refer to drainage pattern **B** and describe the relationship between;
- (a) Drainage density and low rainfall (2)
- (b) Drainage density and steep gradient (2)

2.4 Refer to the diagram of a flood plain.



- 2.4.1 State the geomorphological process that gave rise to the formation of the flood plain. (1 x 1) (1)
- 2.4.2 Describe the gradient at X. (1 x 2) (2)
- 2.4.3 Suggest TWO reasons for the wide flood plain at X. (2 x 2) (4)
- 2.4.4 In a paragraph of approximately EIGHT lines, explain the physical (natural) impact of flooding on the flood plain. (4 x 2) (8)

- 2.5 Refer to the sketch map of rivers Y and Z before river capture has taken place.



[Source: Examiner's own sketch]

- 2.5.1 Define the concept *river capture*. (1 x 2) (2)
- 2.5.2 State ONE condition needed for river capture to take place. (1 x 2) (2)
- 2.5.3 Draw a sketch to illustrate the area after river capture has taken place.
- Marks will be awarded for the accuracy of the sketch and indicating the following labels:
- Elbow of capture
 - Misfit stream
 - Wind gap
- (1 + 3) (4)
- 2.5.4 Will river Y or Z experience rejuvenation after river capture? (1 x 1) (1)
- 2.5.5 Give a reason for your answer to QUESTION 2.5.4. (1 x 2) (2)
- 2.5.6 Refer to your answer to QUESTION 2.5.5 and explain the impact of the change on the captor stream. (2 x 2) (4)

[60]

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON PHALABORWA



Coordinates: 23°52' S ; 31°04' E

Phalaborwa is a town in Limpopo, South Africa. It is located near the confluence of the Ga-Selati River and the Olifants River, along the western border of the Kruger National Park in the Lowveld. Tourism and wildlife play dominant roles in the life of this town. Attractions, such as the Blyde River Canyon, the Three Rondavels, God's Window, Bourke's Luck Potholes and river cruises on the Olifants River, make Phalaborwa an important tourist destination in this province.

[Adapted from <https://en.wikipedia.org/wiki/Phalaborwa>]

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

ENGLISH

Diggings
Golf course
River
Sewerage works
Estate
Salt pan
Nature reserve

AFRIKAANS

Uitgrawings
Golfbaan
Rivier
Rioolwerke
Landgoed
Soutpan
Natuurreservaat

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 In which province is Phalaborwa? (1 x 1) (1)

3.1.2 31 in the map index 2331CC refers to ...

- A longitude.
 - B latitude.
 - C graticule.
 - D code.
- (1 x 1) (1)

3.1.3 What is the map index south-west of 2331CC?

	45°	30°	15°	30°
15'	2330DB	2331CA	2331CB	
45'	2330DD	LIMPOPO 2331CC	2331CD	
24°				
15'	2430BB	2431AA	2431AB	



- A 2331CD
 - B 2431AB
 - C 2430BB
 - D 2330DB
- (1 x 1) (1)

3.1.4 Calculate the area covered by feature **6** in blocks **D4/5** and **E4/5** on the orthophoto map in m².

Use the following information:

Measured length (map distance) = 2 cm

Formula: **Area = Length (L) x Breadth (B)** (4 x 1) (4)

3.1.5 Why does feature **6** appear larger on the orthophoto map than on the topographic map? (1 x 1) (1)

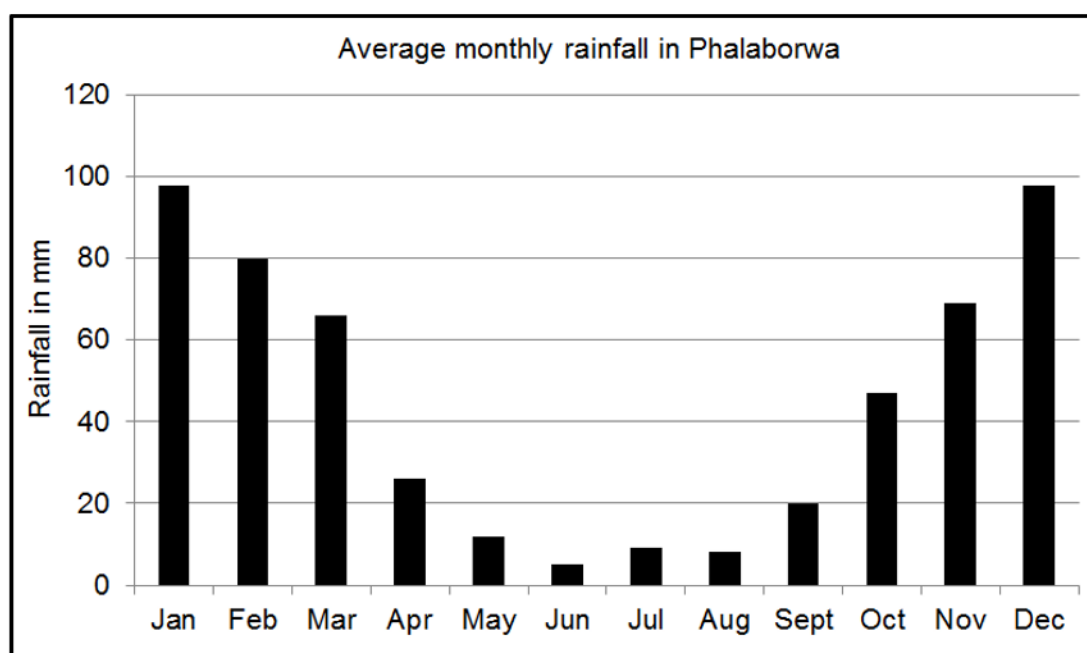
3.1.6 Determine the true bearing from spot height 445, **I** in block **A4** to spot height 421, **J** in block **C4** on the topographic map. (1 x 1) (1)

3.1.7 The magnetic declination for 2021 is 17°10' west of true north. Use the true bearing in your answer to QUESTION 3.1.6 to calculate the magnetic bearing.

Formula: **MB = True bearing (TB) + Magnetic declination (MD)** (1 x 1) (1)

3.2 MAP INTERPRETATION

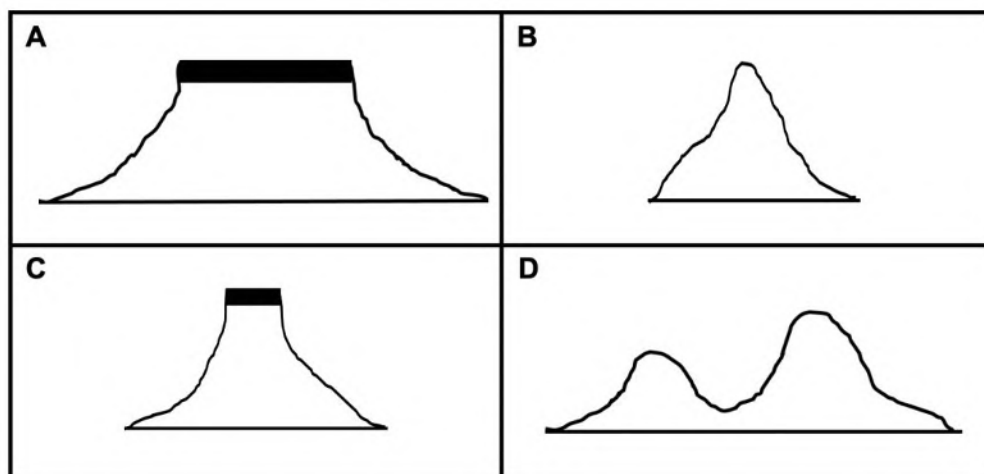
Refer to the seasonal rainfall graph and the topographic map of Phalaborwa.



[Source: [https://www.google.com/search?q=rainfall graph Phalaborwa](https://www.google.com/search?q=rainfall+graph+Phalaborwa)]

- 3.2.1 (a) In which season is the lowest rainfall experienced in Phalaborwa? (1 x 1) (1)
- (b) Identify the type of river that show that the mapped area receives seasonal rainfall. (1 x 1) (1)
- (c) State ONE strategy in block **A2** that has been implemented to overcome water shortages. (1 x 2) (2)
- 3.2.2 The wind direction in blocks **B4** and **C4** on the topographic map is either north-north-west or south-south-east. Give evidence from the blocks above to support this statement. (1 x 2) (2)
- 3.2.3 Landform **7** in block **B1** on the orthophoto map is a ...
- A gap.
 - B pass.
 - C gorge.
 - D saddle. (1 x 1) (1)
- 3.2.4 The feature at **F** in block **C5** on the topographic map is a/an ...
- A interfluvium.
 - B confluence.
 - C watershed.
 - D catchment. (1 x 1) (1)

- 3.2.5 Match landform **8** in block **C1** on the orthophoto map with the correct freehand cross-section.



(1 x 1) (1)

Refer to block **A4** on the topographic map.

- 3.2.6 Give the general direction in which river **G** is flowing. (1 x 1) (1)
- 3.2.7 How do tributaries assist in identifying the direction in which river **G** flows? (1 x 2) (2)

3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

Refer to the demarcated area in block **A1** on the topographic map.

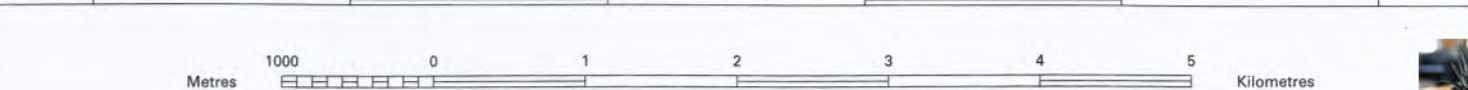
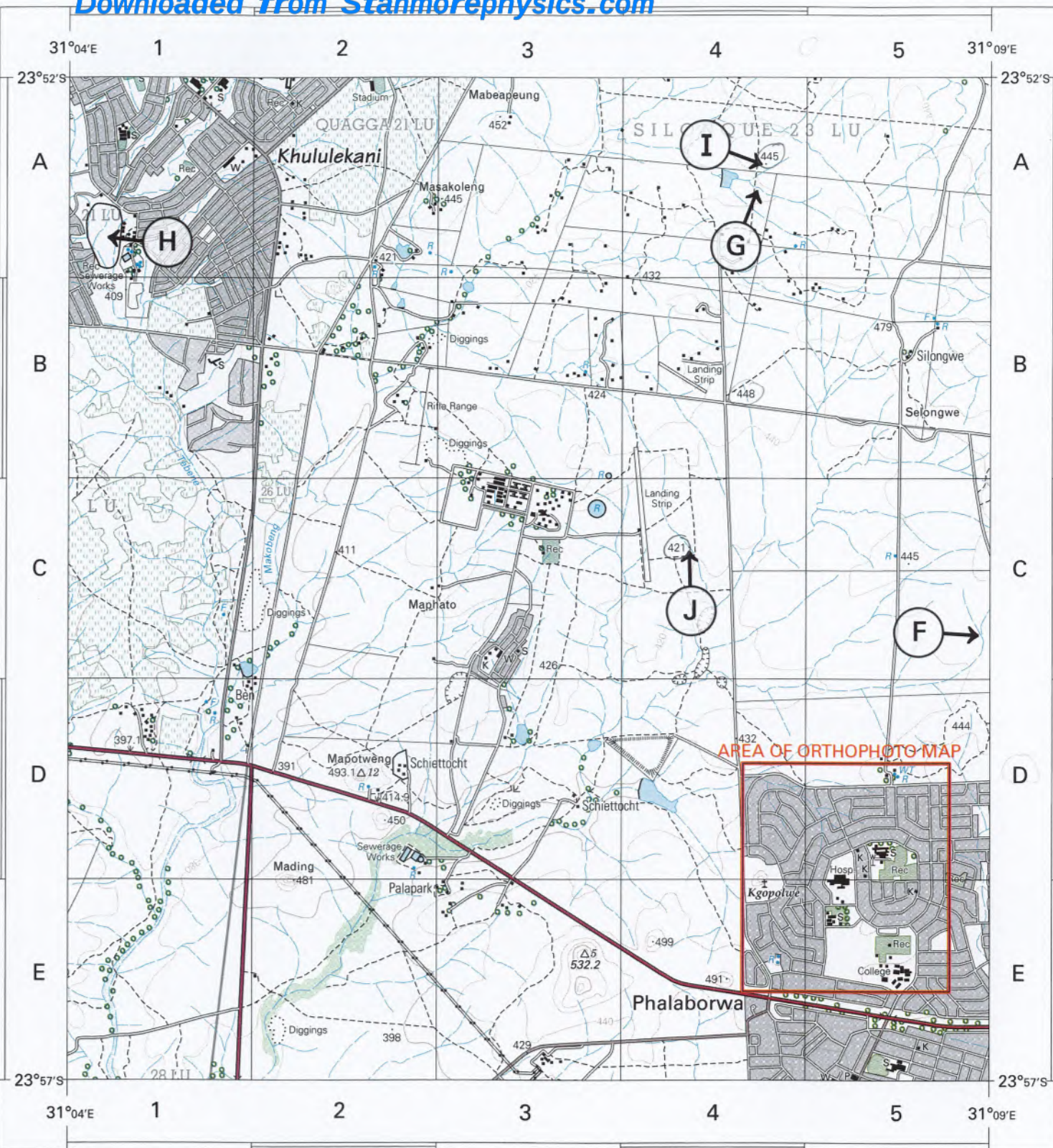
- 3.3.1 The non-perennial rivers in the demarcated area are an example of (raster/vector) data. (1 x 1) (1)
- 3.3.2 Which GIS concept describes the process of demarcation in block **A1**?
 A Buffering
 B Fencing
 C Security
 D Querying (1 x 1) (1)
- 3.3.3 Give evidence to show how this process was implemented to demarcate the non-perennial rivers. (1 x 2) (2)

Refer to block **B4** on the topographic map.

- 3.3.4 Identify TWO examples of data layers that were considered by GIS specialists before developing the landing strip in block **B4**. (2 x 1) (2)
- 3.3.5 Why was it important for GIS specialists to utilise the layers identified in QUESTION 3.3.4? (1 x 2) (2)

[30]

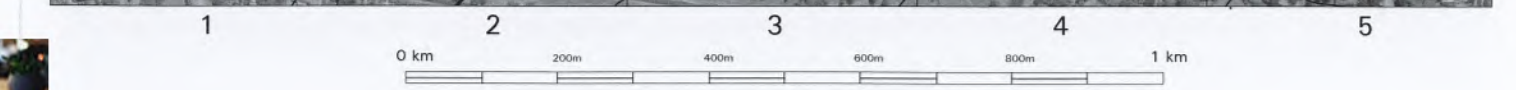
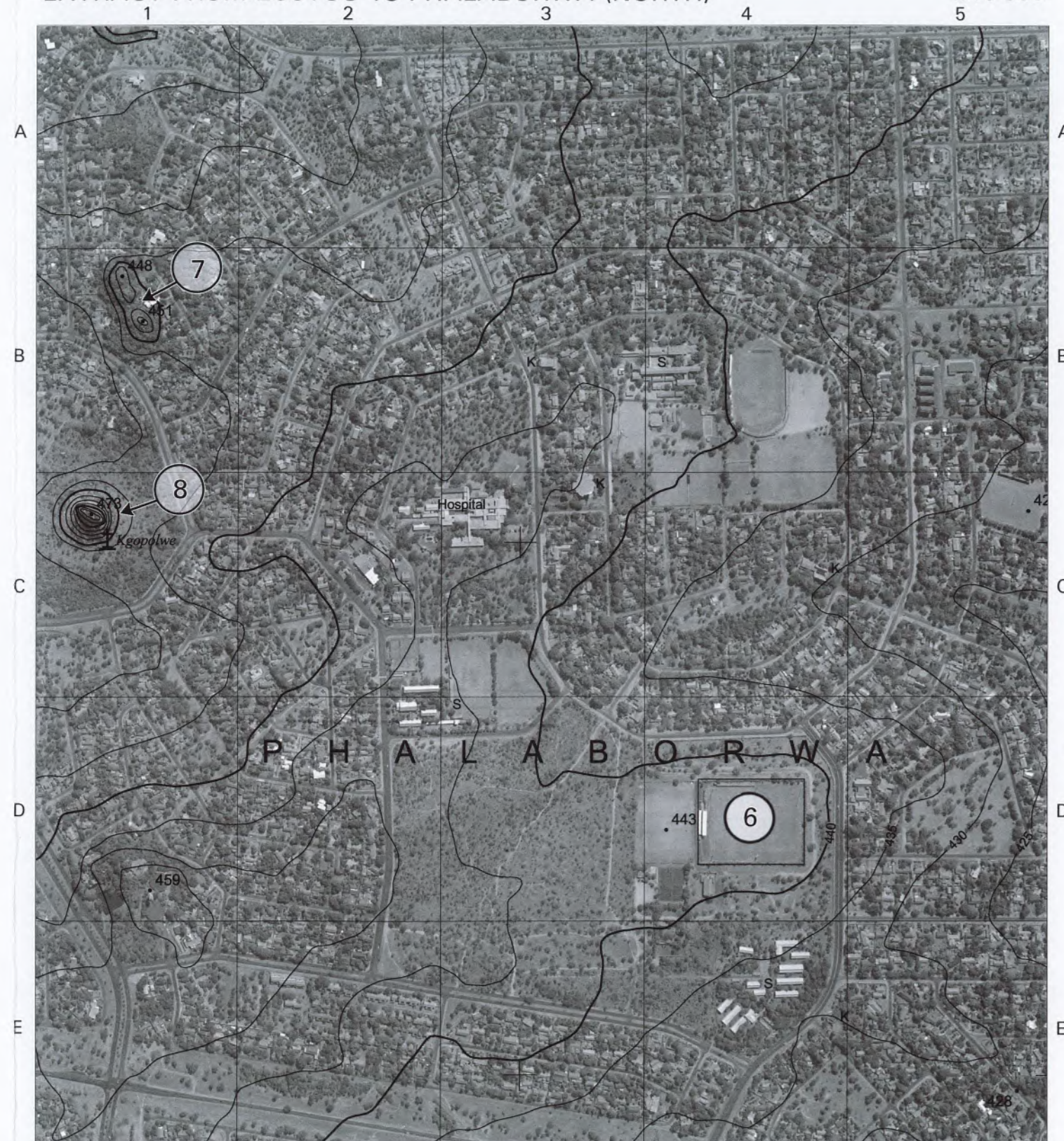
TOTAL: 150



Mean magnetic declination 15°52' West of True North (September 2012).
Mean annual change 2' Westwards (Sept. 2012 - Aug. 2013).

REFERENCE

National Freeway; National Route	International Boundary and Beacon	Fence; Wall
Arterial Route	Provincial Boundary	Windpump; Monument
Main Road	Protected Area	Communication Tower
Secondary Road; Bench Mark	Perennial River	Mine Dump; Excavation
Other Road; Bridge	Perennial Water	Trigonometrical Station; Marine Beacon
Track and Hiking Trail	Non-perennial River	Lighthouse and Marine Light
Railway; Station or Siding	Non-perennial Water	Cemetery; Grave
Other Railway; Tunnel	Dry Water Course	Erosion; Sand
Embankment; Cutting	Dry Pan	Woodland
Power Line	Marsh and Vlei	Cultivated Land
Built-up Area (High, Low Density)	Pipeline (above ground)	Orchard or Vineyard
Buildings; Ruin	Water Tower; Reservoir; Water Point	Recreation Ground
Post Office; Police Station; Store	Coastal Rocks	Row of Trees
Place of Worship; School; Hotel	Prominent Rock Outcrop	Original Farms



Mean magnetic declination 15°52' West of True North (September 2012).
Mean annual change 2' Westwards (Sept. 2012 - Aug. 2013).

VERKLARING

Nasionale Deurpad; Nasionale Roete	Internasionale Grens en Baken	Draadheining; Muur
Hoofverkeersroete	Provinsiale Grens	Windpomp; Monument
Hoofpad	Bewarings Gebied	Kommunikasietoring
Sekondêre Pad; Hoogtemerk	Standhoudende Rivier	Mynhoop; Uitgraving
Ander Pad; Brug	Standhoudende Water	Peilbaken; Seevaartbaken
Dowwe Pad en Voetslaanpad	Nie-standhoudende Rivier	Vuurtoring en Seevaartlig
Spoorweg; Stasie of Sylyn	Nie-standhoudende Water	Begraafplaas; Graf
Ander Spoorweg; Tonnel	Droë Loop	Erosie; Sand
Opvulling; Deurgrawing	Droë Pan	Beboste Gebied
Kraglyn	Moeras en Vlei	Bewerkte Land
Beboude Gebied (Hoë, Laë Digtheid)	Pylyn (bo die grond)	Boord of Wingerd
Geboue; Mursie	Watertoring; Reservoir; Waterpunt	Ontspanningsterrein
Poskantoor; Polisiestasie; Winkel	Kuslynrotse	Rye Bome
Plek van Aanbidding; Skool; Hotel	Prominente Klipbank	Oorspronklike Plase



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NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P1

NOVEMBER 2021

MARKING GUIDELINES

MARKS: 150



This marking guideline consists of 11 pages.

SECTION A

QUESTION 1: CLIMATE AND WEATHER



- | | | | |
|-----|-------|---|-------------|
| 1.1 | 1.1.1 | B (1) | |
| | 1.1.2 | D (1) | |
| | 1.1.3 | B (1) | |
| | 1.1.4 | C (1) | |
| | 1.1.5 | C (1) | |
| | 1.1.6 | A (1) | |
| | 1.1.7 | D (1) | |
| | 1.1.8 | A (1) | (8 x 1) (8) |
| 1.2 | 1.2.1 | terrestrial (1) | |
| | 1.2.2 | night (1) | |
| | 1.2.3 | katabatic (1) | |
| | 1.2.4 | B (1) | |
| | 1.2.5 | frost (1) | |
| | 1.2.6 | thermal belt (accept inversion layer) (1) | |
| | 1.2.7 | night (1) | (7 x 1) (7) |

- 1.3 1.3.1 Date /January indicates summer (1)
GIVE ONE
PIECE OF
EVIDENCE
FOR EACH Mozambique (1)
 Madagascar (1)
 Beira (in Mozambique) (1)
 South-westerly movement (1)
 Clockwise circulation symbol (1)
 Located over the South Indian Ocean (1)
 Mozambique channel (1)
 Tropical Cyclone (Eloise) (1)
 Map of Southern Africa (1)
[ANY ONE] (1 x 1) (1)
- 1.3.2 Heavy rainfall / Rainfall of 250mm in 24 hours (1)
STATE TWO
WEATHER
CONDITIONS
IN THE
INFOGRAPHIC Wind speeds up to 140-160 km/hr (1)
 (2 x 1) (2)
- 1.3.3 Increased frictional drag (2)
GIVE ONE
REASON
FOR
DECREASE
IN WIND
SPEED System moves over land (2)
 Decrease in latent heat (2)
 Decrease in moisture levels (2)
[ANY ONE] (1 x 2) (2)
- 1.3.4 Movement over the warm Mozambique channel (2)
ACCOUNT
FOR
INCREASE
IN WIND
SPEED Less friction over Warm Mozambique channel/ ocean (2)
 High temperatures/warm ocean results in increased evaporation (2)
 Increased condensation results in the release of latent heat (2)
 Latent heat drives the system and increases the wind speed (2)
[ANY TWO] (2 x 2) (4)
- 1.3.5 **PRECAUTIONARY MEASURES AND MANAGEMENT STRATEGIES**
THREE
STRATEGIES
TO REDUCE
IMPACT Early warning systems put in place (2)
 Sandbags to reduce flooding (2)
 Reinforcing existing infrastructure (2)
 Awareness and education programmes (2)
 Evacuation protocols and drills (2)
 Stocking up of emergency supplies and necessities (2)
 Identify high lying areas to evacuate people (2)
 Build above flood lines/ coastal zoning (2)
 Tracking the movement of the tropical cyclone
 Good forecasting/ Use of media to update regularly (2)
 Improve accessibility to evacuate people (2)
 Move people to higher ground (2)
 Development of good rescue and emergency services (2)
 Storage/ provision of clean water and food supplies (2)
 Rescue personnel, police, medical personnel on standby (2)
 Maintain coastal vegetation to act as a buffer against storm surges (2)
 Request National and international aid if necessary (2)
[ANY THREE- ACCEPT EXAMPLES] (3 x 2) (6)

- 1.4 1.4.1 Thermal low (1)
IDENTIFY LOW PRESSURE A Accept heat low (1) (1 x 1)
 (1)
- 1.4.2 High temperatures (2)
GIVE A REASON FOR THE FORMATION Rising warm air creates low pressure system (2)
[ANY ONE] (1 x 2) (2)
- 1.4.3 Elongation of isobars (2)
GIVE EVIDENCE FOR RIDGING Bending of the isobars towards the low-pressure (2)
 Outward extension/bulge of isobars away from the high pressure centre (2)
[ANY ONE] (1 x 2) (2)
- 1.4.4 Anticlockwise circulation (from the high pressure) (2)
WHY DOES RIDGING RESULT IN ONSHORE WINDS Ridge extends towards the land (low pressure) (2)
 Elongation of isobars occurs towards the coastline (2)
[ANY TWO] (2 x 2) (4)
- 1.4.5 Results in SSE winds (anti-clockwise circulation from the high pressure) (2)
DESCRIBE WEATHER CONDITION SAT PE Increase in wind speeds/strong /gale force winds (2)
 Precipitation in the form of rainfall (2)
 Possibility of drizzle (2)
 Overcast conditions (increase in cloud cover) (2)
 Increasing humidity (small difference between air temperature and dew point temperature) (2)
 Decrease in air temperature (as air advects onto the land) (2)
[ANY THREE] (3 x 2) (6)
- 1.5 1.5.1 Kalahari High (1)
NAME TWO PRESSURE SYSTEMS TO SET UP BERG WINDS Coastal low (1) Accept Mid-latitude cyclone (1)
 (2) (2 x 1)
- 1.5.2 Accept in the range 43.9°C to 44,1 °C (1)
DETERMINE HIGHEST TEMP (1) (1 x 1)
- 1.5.3 The escarpment has a greater vertical height (elevation) (2)
WHAT ROLE DID THE ESCARPMENT PLAY IN INCREASING THE TEMP Greater frictional drag as air moves down the escarpment (increases temperature) (2)
 Air has a greater vertical descent down the escarpment (1200m-0m) and heats up more (2)
 Increased heating (DALR at 1°C/100m) due to vertical distance of the escarpment (2)
[ANY TWO] (2 x 2) (4)
- 1.5.4 Plants (Natural vegetation / Pasture) dry out due to the hot dry winds (2)
PARAGRAPH EXPLAIN THE IMPACT OF BERG WIND ON PHYSICAL ENVIRO Reduction of biodiversity (fauna and flora) within the natural environment (2)
 Declining ecosystems will disrupt food chains and food web networks (2)
 Higher evaporation reduces soil moisture content (2)
 Increased loss of moisture in soil will accelerate soil erosion (2)

The land is left bare and vulnerable and accelerates soil erosion reducing soil fertility (2)
Higher levels of carbon dioxide will increase atmospheric pollution (2)
Water from shallow pools, small non-perennial water bodies can evaporate (2)
Natural vegetation is destroyed by veld fires (2)
Loss of habitat/damage to ecosystems due to veldfires (2)
Increase in carbon dioxide as a result of veldfires impacts negatively on physical environment (2)
Ash of veldfires act as fertilisers for the development and growth of new vegetation (2)
Veldfires can promote seed germination (2)

[ANY FOUR]

(4 x 2) (8)
[60]

QUESTION 2: GEOMORPHOLOGY

2.1 2.1.1 B (1)

2.1.2 C (1)

2.1.3 D (1)

2.1.4 C (1)

2.1.5 C (1)

2.1.6 D (1)

2.1.7 B (1)

2.1.8 B (1)

(8 x 1) (8)

2.2 2.2.1 X (1)

2.2.2 Y (1)

2.2.3 X (1)

2.2.4 Y (1)

2.2.5 X (1)

2.2.6 X (1)

2.2.7 X (1)

(7 x 1) (7)

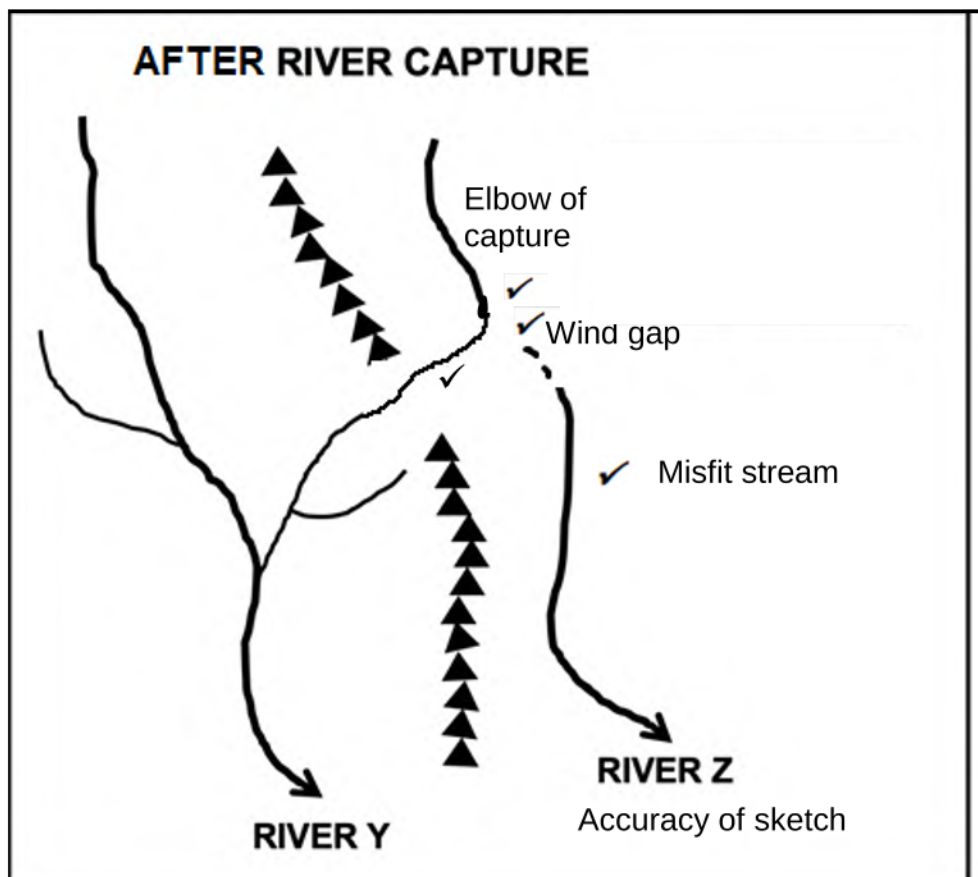


- 2.3 2.3.1 **A** Trellis (1)
B Dendritic (1) (2 x 1) (2)
- 2.3.2 **A** Alternate layers of hard and soft rock/ folded rock structure (2)
DIFFERENTIATE **B** Rock that is uniformly resistant to erosion (2) (2 x 2) (4)
- 2.3.3 The streams flow in relation to the folds of the rock (2)
WHY ARE TRIBUTARIES OF MAIN STREAM PARALLEL The streams flow over softer rock of the syncline (valley) (2)
 Interfluves are parallel (2)
[ANY ONE] (1 x 2) (2)
- 2.3.4 3rd (order) (2) (1 x 2) (2)
 (2)
- 2.3.5 Higher (1) (1 x 1) (1)
- 2.3.6 (a) The low rainfall will result in a lower drainage density (2)
DESCRIBE THE RELATIONSHIP (b) The steep gradient will result in a higher drainage density (2)
 (4) (2 x 2) (2)
- 2.4.1 Deposition (1) (1 x 1) (1)
- 2.4.2 Gentle/ flat/ level (2) (1 x 2) (2)
 (2)
- 2.4.3 Increased deposition of silt/alluvium/sand on the floodplain (2)
GIVE TWO REASONS FOR WIDE FLOODPLAIN AT X River is shallow resulting in more deposition (2)
 Many tributaries deposit sediment (2)
 The gentle slope reduces the velocity of the river and the amount of sediment carried (2)
 Regular flooding in the area (2)
[ANY TWO] (2 x 2) (4)
- 2.4.4 The deposition of silt increases the width of the floodplain (2)
PARAGRAPH EXPLAIN PHYSICAL IMPACT OF FLOODING ON FLOODPLAIN The deposition of fertile soil materials improves the nature and amount of vegetation available on the floodplain (2)
 Deposition of alluvium increases the quality of the soil (2)
 Levees form on the floodplain as flooding occurs (2)
 Create wetlands which are habitats for living organisms (2)
 Increases soil moisture content that supports vegetation/ improves biodiversity (2)
 Allows floodwaters to spread out and excess water is stored (2)
 Continuous flooding purifies water/increase water quality (2)
 The water table rises resulting in marshes and vleis/ wetlands on the floodplain (2)
 The waterlogged soils reduce access to parts of the floodplain (2)
 The level of infiltration along the floodplain increases the saturation level of soil (2)
 The biodiversity of the floodplain alters to adapt to the changing conditions (2)
 Continuous flooding or submergence negatively impacts on the natural vegetation/floodplain (2)
[ANY FOUR] (4 x 2) (8)

2.5 2.5.1 When a more energetic river captures the headwaters of a less energetic river (2)
 DEFINE [CONCEPT] (1 x 2) (2)

2.5.2 A steeper gradient (on the one side of the watershed) (2)
 STATE ONE CONDITION More rainfall (on one side of the watershed) (2)
 Less resistant/softer rock (on the one side of the watershed) (2)
 [ANY ONE] (1 x 2) (2)

2.5.3



Marks allocated as follows:

- Accuracy of sketch- any one of two tributaries can be used (1)
 - Wind gap (1)
 - Elbow of capture (1)
 - Misfit stream (1)
- (1 + 3) (4)

2.5.4 River Y (1) (1 x 1) (1)

2.5.5 River Y has an increased volume of water (2) (1 x 2)

REASON

- 2.5.6 Increased vertical erosion due to the increased volume of water in river Y (2)
- EXPLAIN THE IMPACT OF THE CHANGE IN THE CAPTOR STREAM
- The active erosion of the river cuts into the valley forming terraces (2)
- The softer rock in the valley erodes faster resulting in layers/terraces (2)
- New valleys form in a valley due to increased river discharge (2)
- Terraces form due to recurrent rejuvenation in several valleys (2)
- Meanders will become incised/entrenched (2)
- A knickpoint can develop along the profile of the river (2)
- Increased flooding because of greater volume of water (2)
- Increased velocity of water in the river channel because of greater volume of water (2)
- The captor stream will be able to carry a greater load/less deposition (2)
- [ANY TWO]** (2 x 2) (4)
- [60]**

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

- 3.1 3.1.1 Limpopo (1)  (1 x 1) (1)
- 3.1.2 A (1) (1 x 1) (1)
- 3.1.3 C (1) (1 x 1) (1)
- 3.1.4 **Area = Length (L) x Breadth (B)**
- Area = [2 cm x 100] x [1.6 (1) cm x 100] [Range: Breadth (1,5 – 1,7 cm)]
 = 200 (1) m x 160 (1) m [Range: 150m – 170m]
 = 32 000 m² (1) [Range: 30 000 m² – 34 000 m²]
 (4 x 1) (4)
- 3.1.5 WHY
FEATURE IS
LARGER ON
ORTHO PHOTO The scale of the orthophoto map is (5 times) larger than the scale of the
 topographic map (1)
 (Accept) The scale of the topographic map is (5 times) smaller than the scale
 of the orthophoto map (1)
[ANY ONE] (1 x 1) (1)
- 3.1.6 190° (Range: 189 ° - 191°) (1) (1 x 1) (1)
- 3.1.7 **MB = TB + MD**
- MB = 190° + 17°10'
 = 207°10' (1) (Range: 206°10' - 208°10')
 (1 x 1) (1)
- 3.2 3.2.1 (a) Winter (1) (1 x 1) (1)
- TYPE OF
RIVER (b) Non-perennial rivers (1)
 Accept Periodic (1)
[ANY ONE] (1 x 1) (1)
- STATE
ONE
STRATEGY (c) Perennial water (2)
 Accept dams (2)
 Reservoirs (2)
[ANY ONE] (1 x 2) (2)
- 3.2.2 WIND
DIRECTION The orientation of the landing strip (2)
 Planes take off and land according to the prevailing wind directions (2)
[ANY ONE] (1 x 2) (2)
- 3.2.3 D (1) (1 x 1) (1)
- 3.2.4 B (1) (1 x 1) (1)
- 3.2.5 B (1) (1 x 1) (1)

	3.2.6	West north west / North west/ (1)	(1 x 1) (1)
	3.2.7	Tributaries join the main river at acute angles (2)	(1 x 2) (2)
	HOW TRIBUTARIES IDENTIFY DIRECTION		
3.3	3.3.1	Vector (1)	(1 x 1) (1)
	3.3.2	A (1)	(1 x 1) (1)
	3.3.3	A wall (black line) was used to demarcate the area around the rivers (2)	
	GIVE EVIDENCE TO DEMARCAT	No buildings in the demarcated area (2)	
		No human activity/ no development (2)	
		No cultivation visible (2)	
		[ANY ONE]	(1 x 2) (2)
	3.3.4	Rivers (1) Accept Drainage (1)	
	IDENTIFY LAYERS	Roads (1) Accept Infrastructure (1)	
		Buildings (1) Accept Land-use (1)	
		Contour lines (1) Accept Relief/Topography (1)	
		Rock/soil structure (1) Accept Geology (1)	
		[ANY TWO]	(2 x 1) (2)
	3.3.5	To determine the level of drainage/waterlogging (2)	
	WHY WAS IT IMPORTANT TO UTILISE THE LAYERS	To assess the possibility of flooding (2)	
		To determine the accessibility of the landing strip (2)	
		To determine the availability of open spaces (2)	
		To determine the nature of the gradient (2)	
		To determine the nature of the soil (2)	
		To determine the (stability of the) geological structure of the underlying rock (2)	
		[ANY ONE]	(1 x 2) (2)
			[30]

TOTAL: 150