education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P1 (THEORY - SECTION A) &

GEOGRAPHY P2 (MAPWORK - SECTION B)

COMMON TEST

MARCH 2019

MARKS: 100 (THEORY 75 + MAPWORK 25)

TIME: 1½ hour (THEORY 1 hour + MAPWORK 30 minutes)

N.B. This question paper consists of 12 pages and an Annexure of 4 pages.

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INSTRUCTIONS

1. The question paper consists of **TWO** sections**: SECTION A (Paper 1)** and **SECTION B (Paper 2)**

2. Both sections must be written in ONE session: 1.5 hours.

3. SECTION A: Paper 1: CLIMATE AND WEATHER AND GEOMORPHOLOGY (1 HOUR) MARKS: 75

4. SECTION B: Paper 2: MAPWORK (30 MINUTES) MARKS: 25

5. ALL diagrams in **SECTION A** are included in the **Annexure**.

6. Answer **ALL** questions.

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QUESTION 1

1.1 Refer to **FIGURE 1.1** showing a Synoptic Weather Map in the Annexure.

Choose the correct word in brackets. Write down the correct answer only next to the question number (1.1.1 – 1.1.8) in the answer book.

1.1.1 The high-pressure cell **A** is the (South Atlantic High/South Indian High).

1.1.2 The air circulation around pressure cell **B** is (clockwise/anticlockwise).

1.1.3 The extension labelled **C** of the high-pressure cell **B** is a (ridge/trough).

1.1.4 The mid-latitude cyclone **F** is in its (mature/dissipating stage).

1.1.5 The pressure gradient of the cold front **H** is (steep/gentle).

1.1.6 The wind at East London (inset) is blowing in a (south easterly/ north westerly) direction.

1.1.7 The term that best describes a series of mid-latitude cyclones is a (family/hurricane).

1.1.8 The atmospheric pressure will (increase/decrease) as the front moves over Cape Town. (8 x 1) (8)

1.2 Refer to **FIGURE 1.2** showing river flow patterns.

Indicate whether each of the statements below refer to turbulent or laminar flow in a river. Write down the numbers 1.2.1 to 1.2.7 in your ANSWER BOOK and your answer only, example 1.2.8 laminar.

1.2.1 Associated with an irregular and swirling flow.

1.2.2 Commonly occurs in the upper course of the river.

1.2.3 Has a large stream load carrying capacity.

1.2.4 Occurs where the river bed is even.

1.2.5 Water flows in thin layers.

1.2.6 Effective in eroding and transporting sediments.

1.2.7 Occurs where rapids are visible in the river's course. (7 x 1) (7)

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1.3 Study the cyclone in **FIGURE 1.3**.

1.3.1 Give evidence that indicates that the sketch shows a cyclone in the northern hemisphere. (1 x 1) (1)

1.3.2 Name the section of the moving disturbance where the highest wind speeds are recorded. (1 x 1) (1)

1.3.3 Give ONE reason why the descending (sinking) air in the eye is dry. (1 x 1) (1)

1.3.4 Explain why satellite images are effective for tracking cyclones. (2 x 2) (4)

1.3.5 Write a paragraph of approximately EIGHT lines outlining the possible economic and environmental impact of cyclones such as the one illustrated in FIGURE 1.3. (4 x 2) (8)

1.4 Refer to **FIGURE 1.4** showing valley climates.

1.4.1 Name the local wind **A** that influences the development of the thermal belt at night. (1 x 1) (1)

1.4.2 What role does terrestrial radiation play in the formation of the wind **A** mentioned in QUESTION 1.4.1? (1 x 2) (2)

1.4.3 Why are winds **A** associated with temperature inversion? (2 x 2) (4)

1.4.4 Account for the occurrence of radiation fog in the valley. (2 x 2) (4)

1.4.5 Suggest TWO reasons why people in this valley would most likely build their houses mid-way up the slope of the valley **(B)**, rather than on the valley floor. (2 x 2) (4)

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1.5 Refer to **FIGURE 1.5** in the Annexure showing two drainage basins.

1.5.1 Identify the highlying area labelled **A**. (1 x 1) (1)

1.5.2 Which drainage basin, **B** or **C**, has a higher drainage density? (1 x 1) (1)

1.5.3 Describe the influence that prolonged rainfall will have on the drainage density of drainage basin **C.** (1 x 1) (1)

1.5.4 Explain why flooding is more likely to occur at **D** rather than **E.** (1 x 2) (2)

1.5.5 Explain the influence that a higher rainfall will have on the meander at **F** in the river channel. (1 x 2) (2)

1.5.6 Write a paragraph of approximately EIGHT lines to suggest the possible reasons for the formation of a delta at the river mouth of drainage basin **C**. (4 x 2) (8)

1.6 Study **FIGURE 1.6** which illustrates the longitudinal profile of a river and the cross- profiles of each stage.

1.6.1 Differentiate between a *cross-profile* and a *longitudinal profile* of a river. (2 x 1) (2)

1.6.2 Identify the THREE stages labelled as **1, 2 and 3** in the longitudinal profile in FIGURE 1.6. (3 x 1) (3)

1.6.3 (a) Match the cross profiles,labelled **A** and **C**, with the river course which you will find them in. (2 x 1) (2)

(b) Give reasons for your answer to QUESTION 1.6.3(a). (2 x 2) (4)

1.6.4 (a) The river profile in FIGURE 1.6 is ungraded. Give a reason to suppor this statement. (1 x 2) (2)

(b) Suggest ONE way in which the ungraded profile in FIGURE 1.6 can become graded. (1 x 2) (2)

TOTAL MARKS: [75]

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25

Basic Education

KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

GEOGRAPHY P2 (MAPWORK) – SECTION B

COMMON TEST

MARCH 2019

NATIONAL SENIOR CERTIFICATE

GRADE 12

MARKS: 25

TIME: 30 minutes

NAME: _____

DIVISION: _____

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RESOURCE MATERIAL

1. An extract from topographical map 2930 CB PIETERMARITZBURG (EXTRACT).
2. Orthophoto map 2930 CB 8 PIETERMARITZBURG.
3. **NOTE:** The resource material must be collected by schools for their own use.

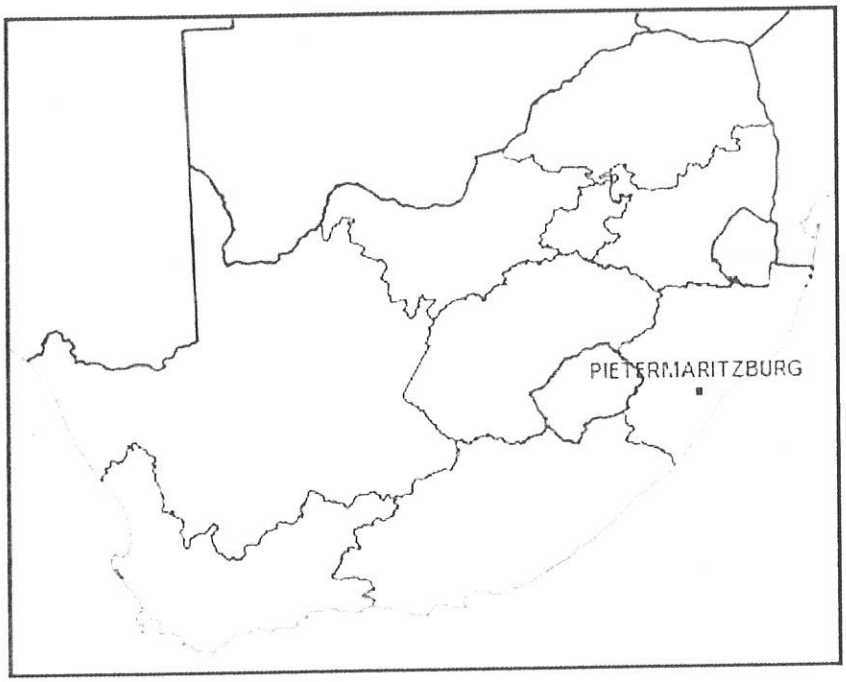
INSTRUCTIONS AND INFORMATION

1. Write your NAME and DIVISION in the spaces on the cover page.
2. Answer ALL the questions in the spaces provided in this question paper.
3. You are provided with a 1 : 50 000 topographical map (2930 CB PIETERMARITZBURG) and an orthophoto map (2930 CB 8 PIETERMARITZBURG) of a part of the mapped area.
4. You must hand the topographical map and the orthophoto map to the invigilator at the end of this test session.
5. You may use the blank page at the back of this question paper for all rough work and calculations. Do NOT detach this page from the question paper.
6. Show ALL calculations and formulae, where applicable. Marks will be allocated for these.
7. Indicate the unit of measurement in the final answer of calculations, e.g. 10km; 2.1cm.
8. You may use a non-programmable calculator.
9. You may use a magnifying glass.
10. The area demarcated in RED on the topographic map represents the area covered by the orthophoto map.
11. The following English terms and their Afrikaans translations are shown on the topographical map:

ENGLISH	AFRIKAANS
Aerodome	Vliegveld
Diggings	Uitgrawings
Canal	Kanaal
Firebreak	Brandgordel
Hiking Trail	Staproete
Golf Course	Gholfbaan
Hospital	Hospitaal
River	Rivier
Sewage Works	Rioolwerke
Waterworks	Waterwerke

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GENERAL INFORMATION ON PIETERMARITZBURG



Pietermaritzburg (umGungundlovu) is the capital city of KwaZulu-Natal. This second-largest city in the province was founded in 1838. It is a regionally important industrial hub, well-known for processing aluminium, timber and dairy products. It has an estimated population of around 500 000 (including neighbouring townships). Pietermaritzburg is situated along the N3 national road, the main route between the Pretoria-Witwatersrand-Vereeniging conurbation and the harbour city of Durban, some 90 kilometres from Pietermaritzburg. The Oribi airport is situated just outside Pietermaritzburg and has a regular scheduled service to the OR Tambo International Airport in Johannesburg.

[Source: http://en.wikipedia.org/wiki/pietermaritzburg]

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QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographical map (2930CB PIETERMARITZBURG) as well as the orthophoto map as part of the mapped area. 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 Pietermaritzburg is located in the ... province.

A Gauteng
B Kwazulu-Natal
C Orange Free State
D Mpumalanga

1.2 The … projection was used in the drawing of the topographical map of Pietermaritzburg.

A Lambert
B Mercator
C Gauss Conform
D Azimuthal

1.3 The Scottsville Race Course in block **G 9/10** is located … of Town Hill in block **F7** on the topographical map.

A north west
B north
C south east
D north east

1.4 The fluvial feature found on the Msunduze River in block H1 on the topographical map is a/an …

A ox-bow lake
B braided stream
C marsh and vlei.
D meander

1.5 The type of slope found at line **3** on the orthophoto map is a …slope.

A concave
B terraced
C convex
D uniform

[5]

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QUESTION 2: MAPWORK TECHNIQUES AND CALCULATIONS

2.1 Calculate the length of the Deeside dam wall in block **B3** in metres. Show all calculations.

_____

_____

_____ (2)

2.2 Using the information on the topographical map, determine the magnetic declination for this year.

Difference in years: _____

Mean annual change: _____

Total change: _____

Magnetic declination for 2019: _____

_____ (4)

2.3 Explain why it is important to correct the magnetic declination when using a topographical map and a magnetic compass on a hike.

_____

_____

_____ (1)

[7]

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QUESTION 3: APPLICATION AND INTERPRETATION

3.1 The Sewerage Works in block **I 6** has an ideal location. Give ONE reason to support this statement.

_____

_____

_____ (1 x 2) (2)

3.2 There are large areas of greenery within and surrounding the city of Pietermaritzburg. With reference to climate explain the importance of these green areas to the city.

_____

_____

_____ (1 x 2) (2)

3.3 Refer to area **4** on the orthophoto map located in a valley and give reasons why it regularly experiences frost during winter nights.

_____

_____

_____ (1 x 2) (2)

3.4 Suggest how the construction of the canal on the Msunduze river in blocks **G/H 7/8** impacted negatively on the health of the river system.

_____

_____

_____ (1 x 2) (2)

[8]

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QUESTION 4: MAP PROJECTION AND GEOGRAPHICAL INFORMATION SYSTEMS

4.1 Refer to block **D5** on the topographical map.

4.1.1 Identify the type of vector data used in block **D5** to indicate the waterworks.

_____ (1 x 1) (1)

4.1.2 Explain the significance of using the type vector data identified in QUESTION 4.1.1 on the topographical map.

_____

_____ (1 x 1) (1)

4.2 Refer to the orthophoto map

4.2.1 Explain the term spatial resolution.

_____

_____ (1 x 1) (1)

4.2.2 Why can one say that the orthophoto map has a high spatial resolution?

_____

_____ (1 x 2) (2)

[5]

TOTAL MARKS: [25]

GRAND TOTAL: 100

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GRADE 12

GEOGRAPHY P1 (THEORY - SECTION A) &

GEOGRAPHY P2 (MAPWORK - SECTION B)

ANNEXURE

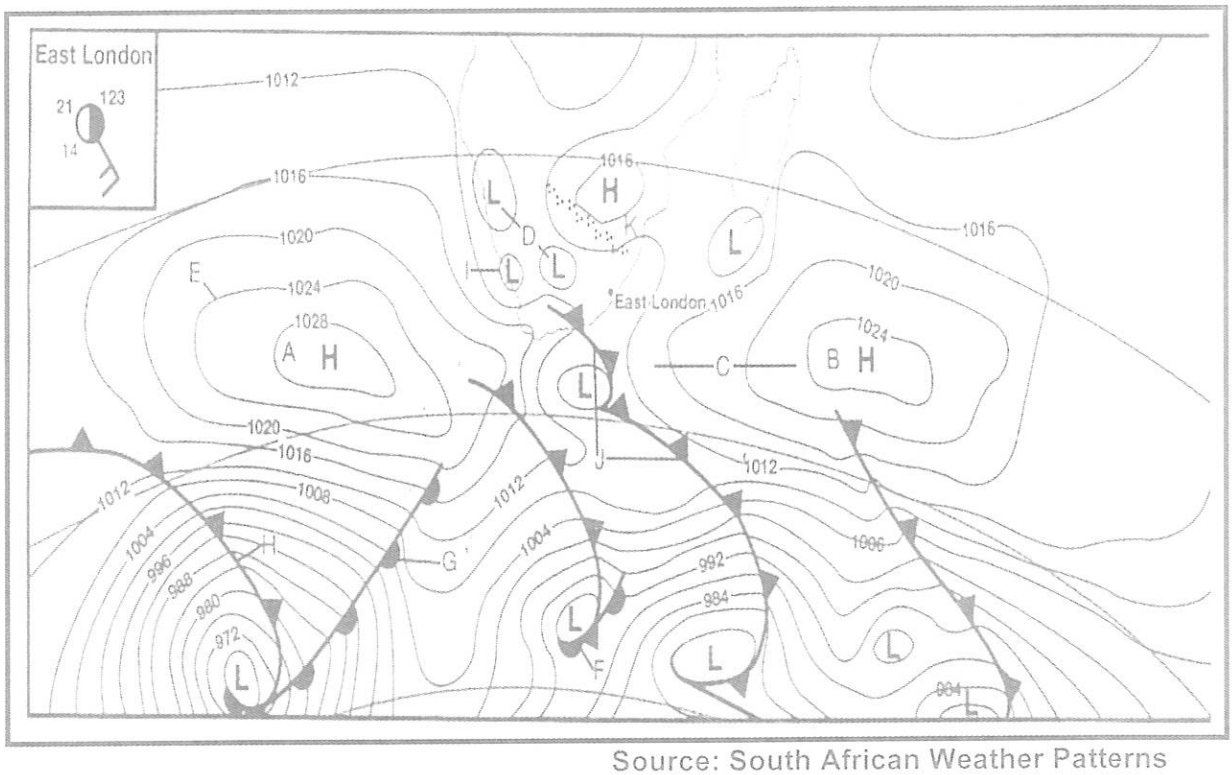
COMMMON TEST

MARCH 2019

N.B. This annexure consists of 4 pages including this page.

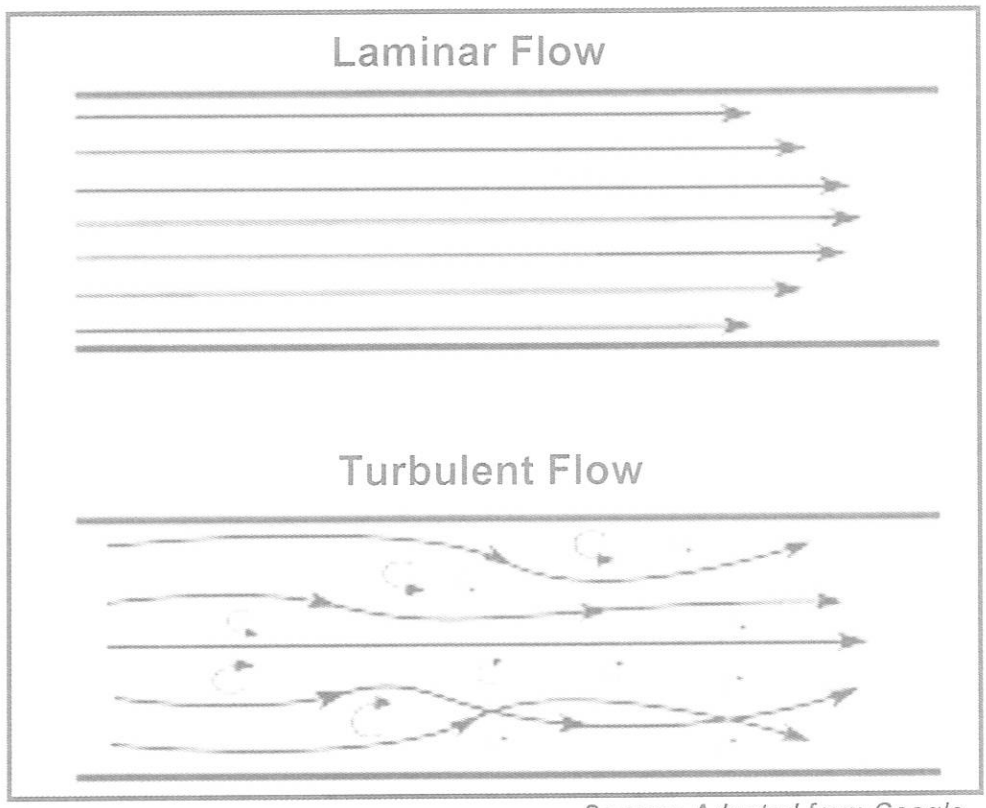
Copyright Reserved

FIGURE 1.1: SYNOPTIC WEATHER MAP



Source: South African Weather Patterns

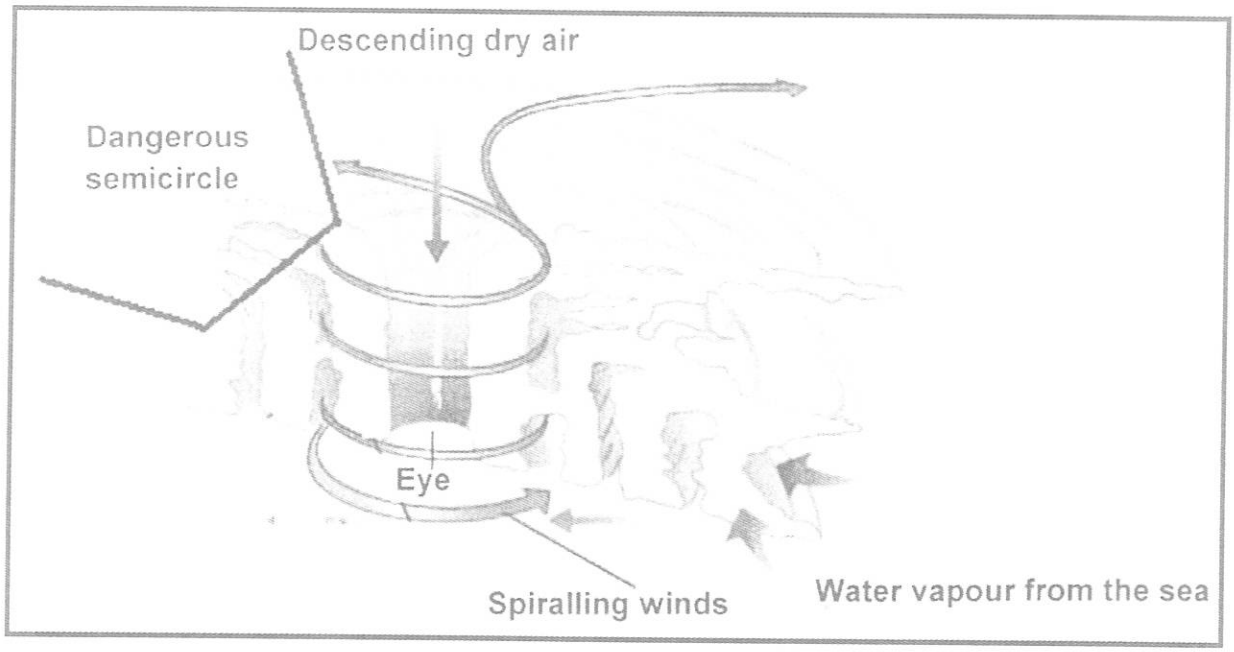
FIGURE 1.2: RIVER FLOW PATTERNS



Source: *Adapted from Google*

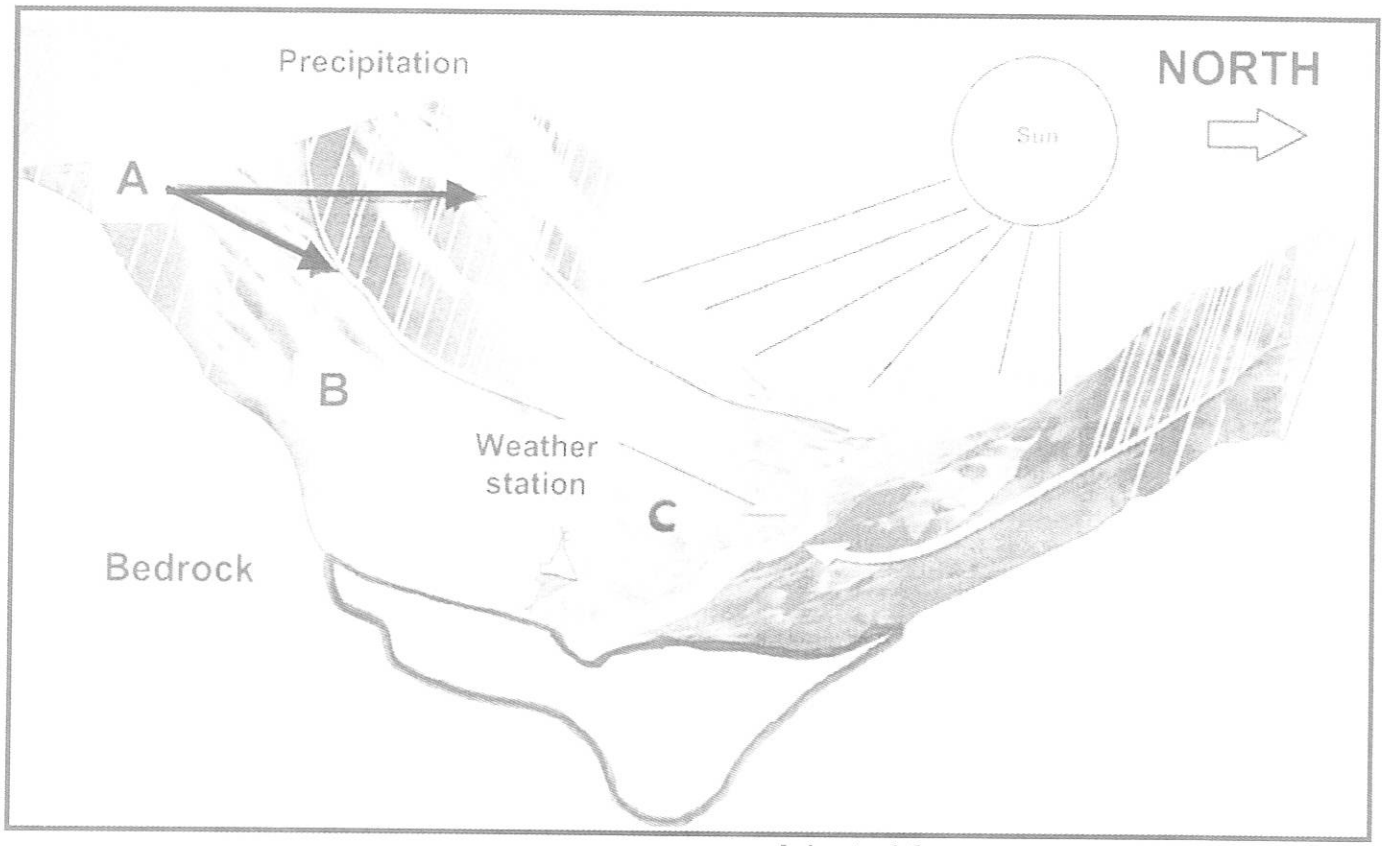
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FIGURE 1.3: CYCLONES



Adapted from Merriam Webster, 2006

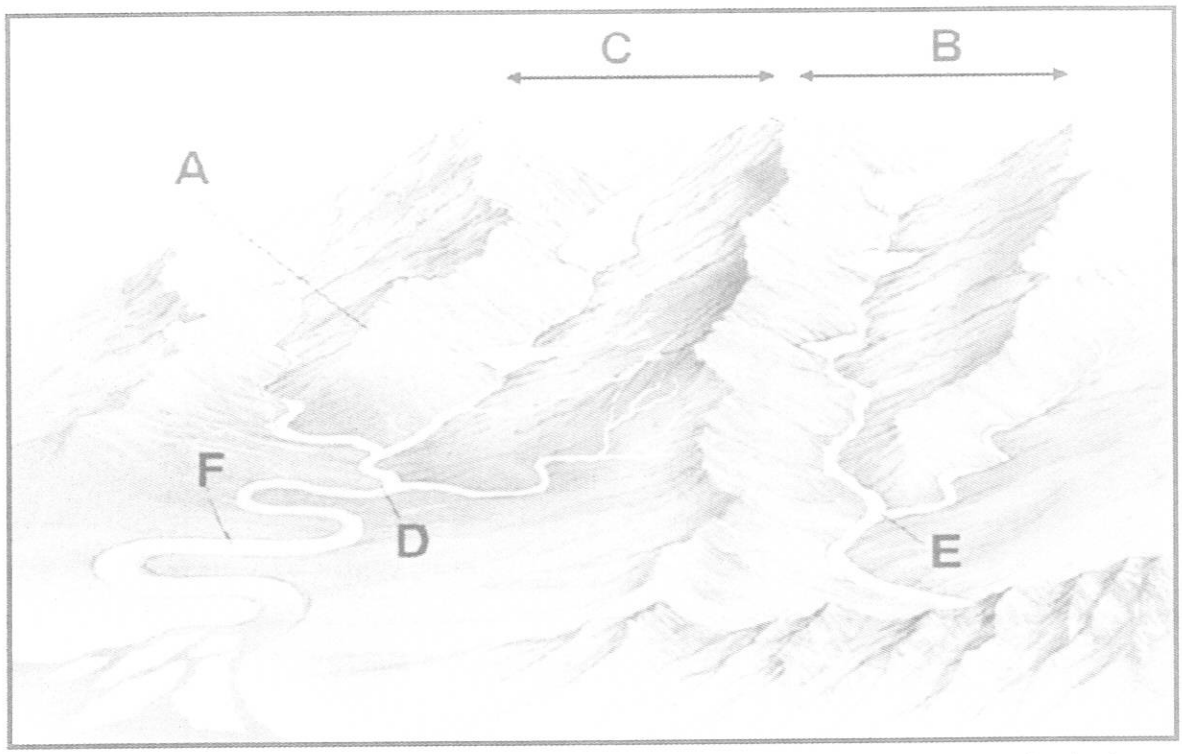
FIGURE 1.4: VALLEY CLIMATES



Adapted from www.valleyclimates.com

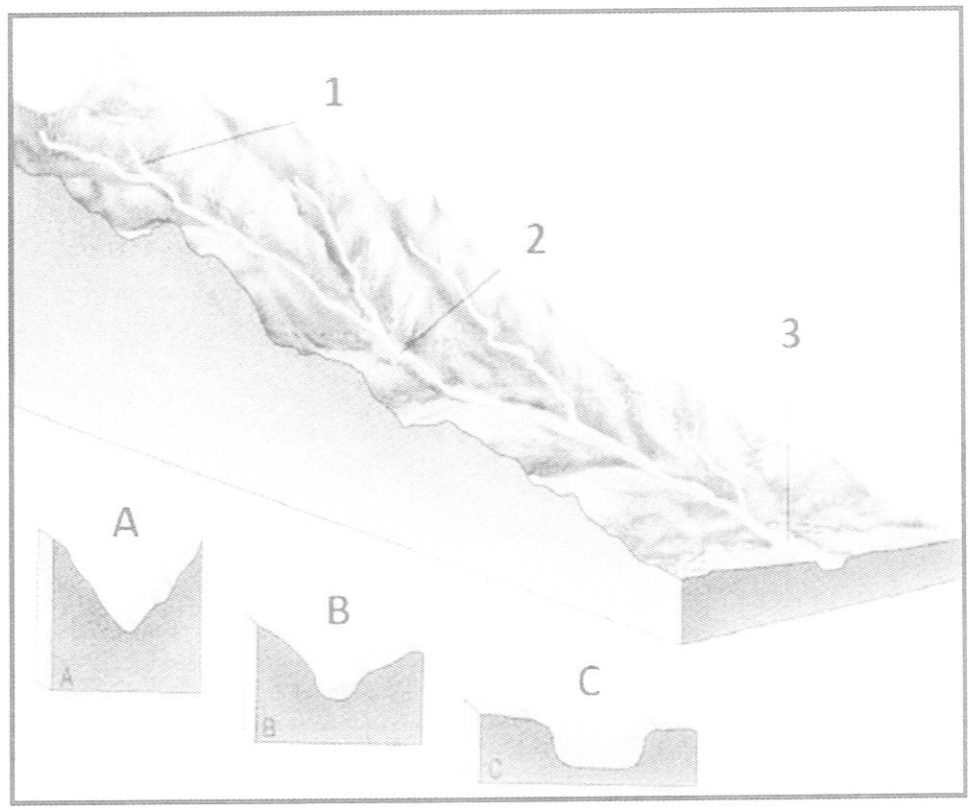
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FIGURE 1.5: DRAINAGE BASIN



[Source: Adapted from Pinterest, Drainage Basins]

FIGURE 1.6: RIVER PROFILE



Source: www.geography.learnontheinternet.co.uk › geotopics › river

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GEOGRAPHY P1 & P2 (SECTION A & B)

MARKING GUIDELINE

COMMON TEST

MARCH 2019

MARKS: 100

N.B. This question memorandum consists of 10 pages.

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SECTION A

QUESTION 1

1.1

1.1.1 South Atlantic High ✓

1.1.2 anticlockwise ✓

1.1.3 ridge ✓

1.1.4 dissipating ✓

1.1.5 steep ✓

1.1.6 north westerly ✓

1.1.7 family ✓

1.1.8 increase ✓ (8 x 1) (8)

1.2

1.2.1 Turbulent ✓

1.2.2 Turbulent ✓

1.2.3 Laminar /turbulent✓

1.2.4 Laminar ✓

1.2.5 Laminar ✓

1.2.6 Turbulent ✓

1.2.7 Turbulent ✓ (7 x 1) (7)

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1.3

1.3.1 Air circulation in an anticlockwise direction ✓
Position of the dangerous semi-circle ✓ (1 x 1) (1)
[ANY ONE]

1.3.2 The dangerous semi-circle ✓
Forward left-hand quadrant ✓
North west quadrant ✓
West of the eye/outside the eye to the west✓ (1 x 1) (1)
[ANY ONE}

1.3.3 Cold air does not condense/Air is cold ✓
The descending air loses moisture as it warms adiabatically ✓ (1 x 1) (1)
[ANY ONE]

1.3.4 Information can be received immediately ✓✓
Information can be monitored ✓✓
Large and inaccessible areas can be monitored ✓✓
The intensity of the storm can be monitored ✓✓
Information can be used to determine wind speed, temperature, wind direction ✓✓
Can be used to predict the path ✓✓ (2 x 2) (4)
[ANY TWO]

1.3.5 NEGATIVE IMPACT ON ECONOMY

Damage to transport and communication networks ✓✓
Damage to land and property ✓✓
Businesses damaged ✓✓
Financial strain on business, families, people ✓✓
Loss to insurance companies on large claims ✓✓
Damage cost to farms, farmers, vegetation, livestock ✓✓
Loss to shipping companies, coastal structures
Cost of repairs ✓✓
Insurance claims will increase✓✓
Negative impact on GDP ✓✓
Negative impact on tourism ✓✓
Unemployment resulting from damage to industries/farms/businesses✓✓
Food insecurity resulting from damage to farms✓✓

POSITIVE IMPACT ON ECONOMY

Fills up dams for agricultural/industrial/domestic purposes

ENVIRONMENTAL IMPACT

Flooding of low-lying coastal areas ✓✓
Coastal erosion✓✓

Saline intrusion of low-lying coastal land ✓✓
Waterborne diseases ✓✓
Ecosystems are disrupted✓✓
Food chains and food webs will be destroyed ✓✓
Silting of dams✓✓
Water table will rise ✓✓
Estuaries and riverine ecosystems will be disrupted ✓✓
Storm surges will cause extensive damages to coastal features ✓✓

POSITIVE IMPACT ON ENVIRONMENT
Cleans the ecosystem✓✓
Revitalizes the river system✓✓
Increases ground water supplies✓✓ (4 x 2) (8)
(MUST MENTION BOTH ECONOMY AND ENVIRONMENT)

1.4

1.4.1 TECHNICAL CONCERN ... QUESTION MUST NOT BE MARKED

1.4.2 TECHNICAL CONCERN ...QUESTION MUST NOT BE MARKED

1.4.3 Cool air descends into the valley floor and forces the warm air from the valley to rise. ✓✓
The warm air rests on top of the cold air. ✓✓
This results in the increase in temperature with height. ✓✓
[ANY TWO] (2 x 2) (4)

1.4.4 Temperature in the valley reaches below dew point temperature ✓✓
Condensation occurs in the lower section of the valley ✓✓
Small visible droplets form radiation fog in the lower parts of the valley ✓✓
[ANYTWO] (2 x 2) (4)

1.4.5 Clear picturesque views of the valley✓ ✓
Situated in the warmer thermal belt✓ ✓
Receives maximum insolation✓ ✓
Area is not damp✓ ✓
Development is above the radiation fog✓ ✓
Less money will be spent on heating or heating systems. ✓ ✓
Less electricity will be used in winter✓ ✓

[ACCEPT ANSWERS IF LEARNERS GIVE REASONS FOR NOT DEVELOPING ON THE VALLEY FLOOR]

Cold on the valley floor✓ ✓
Receives minimum insolation✓ ✓
Area is damp✓ ✓
Affected by the radiation fog✓ ✓
More money will be spent on heating or heating systems. ✓ ✓
More electricity will be used especially in winter✓ ✓
[ANY TWO] (2 x 2) (4)

1.5

1.5.1 Interfluve ✓ (1 x 1) (1)

1.5.2 C ✓ (1 x 1) (1)

1.5.3 It will increase ✓ (1 x 1) (1)

1.5.4 At **D** there are more tributaries joining the main stream. ✓✓
At **D** a larger volume of water joins. ✓✓

At **E** there are less / few tributaries, joining the main stream. ✓✓
At **E** a smaller volume of water joins. ✓✓
[ANY ONE] (1 x 2) (2)

1.5.5 An oxbow lake will form. ✓✓
More erosion on the outer bend/undercut slope✓✓
Water will cut through the neck of the meander. ✓✓
Meander neck will get narrower. ✓✓
(ANY ONE) (1 x 2) (2)

1.5.6 This is the end point of the river where it enters the sea and deposits its load. ✓✓
The river has a large amount of sediments. ✓✓
The sea has weak currents. ✓✓
There is a small tidal range. ✓✓
The sea is shallow at the river mouth. ✓✓
[ANY FOUR] (4 x 2) (8)

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1.6

1.6.1 Cross profile – Drawing of a side profile of a river, from one river bank to the other ✓
(Concept)
Longitudinal profile – Side view of a river from source to mouth ✓
(Concept) (2 x 1) (2)

1.6.2 1 – Upper course / Youth stage/ Torrent stage✓
2 – Middle course / Mature stage/ Valley stage✓
3 – Lower course/ Old age stage / Plain stage ✓ (3 x 1) (3)

1.6.3 (a) A – 1 ✓
C – 3✓ (2 x 1) (2)

(b) Stage 1 has a lot of vertical erosion therefore it has a narrow and steep sided valley (A) ✓✓
Stage 3 has more deposition and lateral erosion therefore has a wide valley (C) ✓✓ (2 x 2) (4)

1.6.4 (a) TECHNICAL CONCERN

(b) TECHNICAL CONCERN

ADJUSTED TOTAL MARKS: [68]

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SECTION B: MAPWORK

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

The questions below are based on the 1:50 000 topographical map (2930CB PIETERMARITZBURG) as well as the orthophoto map as part of the mapped area. 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 Pietermaritzburg is located in the ... province.

A Gauteng
B Kwazulu-Natal
C Orange Free State
D Mpumalanga

B ✓

1.2 The ... projection was used in the drawing of the topographical map of Pietermaritzburg.

A Lambert
B Mercator
C Gauss Conform
D Azimuthal

C ✓

1.3 The Scottsville Race Course in block **G 9/10** is located ... of Town Hill in block **F7** on the topographical map.

A north west
B north
C south east
D north east

C ✓

1.4 The fluvial feature found on the Msunduze River in block H1 on the topographical map is a/an ...

A ox-bow lake
B braided stream
C marsh and vlei.
D meander

D ✓

1.5 The type of slope found at line **3** on the orthophoto map is a ...slope.

A concave
B terraced
C convex
D uniform

D ✓

[5]

QUESTION 2: MAPWORK TECHNIQUES AND CALCULATIONS

2.1 Calculate the length of the Deeside dam wall in block **B3** in metres. Show all calculations.

0.5 x 0.5 = 0.25 km ✓ OR **(0.5 x 500 ✓ = 250m ✓)** ***(Range: 0.4 – 0.6)***
= 0.25 x 1000
= 250 m ✓ ***(200 – 300m)*** (2)

2.2 Using the information on the topographical map, determine the magnetic declination for this year.

Difference in years: **2019 – 2016 = 3 years** ✓
Mean annual change: ***9' Westwards***
Total change: ***9' x 3 = 27'*** ✓
Magnetic declination for 2019: $24^0\ 45'$
$+\checkmark\ 27'$
$24^0\ 72'$
$25^0\ 12'$ ***West of true north*** ✓ (4)

2.3 Explain why it is important to correct the magnetic declination when using a topographical map and a magnetic compass on a hike.

To obtain the precise direction ✓
To maintain a correct path during the hike ✓ (1)

[ANY ONE] **[7]**

QUESTION 3: APPLICATION AND INTERPRETATION

3.1 The Sewerage Works in block **I 6** has an ideal location. Give ONE reason to support this statement.

Flat land ✓✓
Near river for the discharge of treated affluents ✓✓
Cheaper land on the outskirts of the city ✓✓
Situated in the rural urban fringe because of the odour/smell ✓✓ (1 x 2) (2)
[ANY ONE]

3.2 There are large areas of greenery within and surrounding the city of Pietermaritzburg. With reference to climate explain the importance of these green areas to the city.

Helps reduce the temperature within the town ✓✓
Provides oxygen ✓✓
Reduces carbon dioxide ✓✓
Filters pollution within the town ✓✓ (1 x 2) (2)
[ANY ONE]

3.3 Refer to area **4** on the orthophoto map located in a valley and give reasons why it regularly experiences frost during winter nights.

The area is situated inland on high altitude where temperatures are generally low in winter and is conducive to the development of frost. ✓✓

Katabatic winds cause cold air to descend from surrounding hills and as temperature in the town falls below 0 ^{0}C frost develops. ✓✓ (1 x 2) (2)
[ANY ONE]

3.4 Suggest how the construction of the canal on the Msunduze river in blocks **G/H 7/8** impacted negatively on the river system.

The artificial system (canal) has impacted on the ecological balance of Msunduze river system ✓✓
The ecosystem in the river system has been disrupted ✓✓
Reduces the discharge in the river system downstream ✓✓ (1 x 2) (2)
[ANY ONE]

QUESTION 4: MAP PROJECTION AND GEOGRAPHICAL INFORMATION SYSTEMS

4.1 Refer to block **D5** on the topographical map.

4.1.1 Identify the type of vector data used in block **D5** to indicate the waterworks.

Polygon ✓ (1 x 1) (1)

4.1.2 Explain the significance of using the type vector data identified in QUESTION 4.1.1 on the topographical map.

The precise boundary of the waterworks is shown ✓✓ (1 x 1) (1)

4.2 Refer to the orthophoto map.

4.2.1 Explain the term spatial resolution.

It refers to the clarity of an object/image. ✓
It refers to the number of pixels utilized in the construction of a digital image. ✓ (1 x 1) (1)
[Concept]

4.2.2 Why can one say that the orthophoto map has a high spatial resolution?

Features and objects are clearly visible ✓✓
Image is composed of greater number of pixels ✓✓
Displays a greater measure of accuracy of graphic display ✓✓ (1 x 2) (2)
[ANY ONE]

[5]

TOTAL MARKS: [25]

ADJUSTED GRAND TOTAL: 93

$$\frac{\text{TOTAL MARK}}{93} \times \frac{100}{1}$$