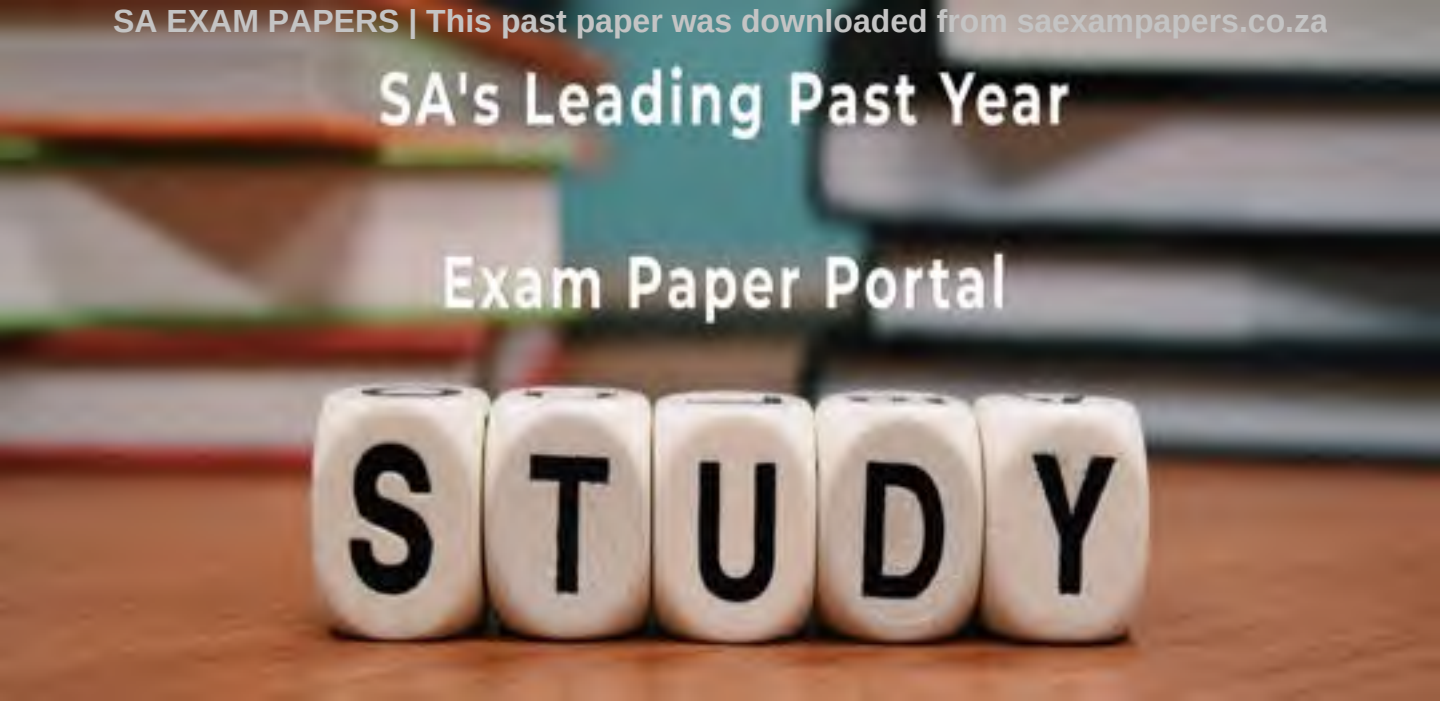


KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GRADE 12

NATIONAL SENIOR CERTIFICATE

GEOGRAPHY P1

PREPARATORY EXAMINATION

SEPTEMBER 2024

MARKS: 150

TIME: 3 hours

This question paper consists of 18 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of THREE questions:

   SECTION A

   QUESTION : 1 CLIMATE AND WEATHER (60 MARKS)

   QUESTION : 2 GEOMORPHOLOGY (60 MARKS)

   SECTION B

   QUESTION : 3 GEOGRAPHICAL SKILLS AND CALCULATIONS (30 MARKS)

2. Answer ALL THREE questions in the ANSWER BOOK provided.
3. ALL diagrams are included in the question paper.
4. Leave a line open between subsections of questions answered.
5. Start EACH question at the top of a NEW page.
6. Number your answers correctly according to the numbering system used in this question paper.
7. Do NOT write in the margins of your ANSWER BOOK.
8. Where applicable illustrate your answers with labelled diagrams.
9. Answer in FULL sentences except where you have to name, identify and list.
10. The unit of measurement must be given in the final answer, where applicable, e.g. 10km, 4°C, east.
11. You may use a non-programmable calculator.
12. You may use a magnifying glass.
13. Write clearly and legibly.

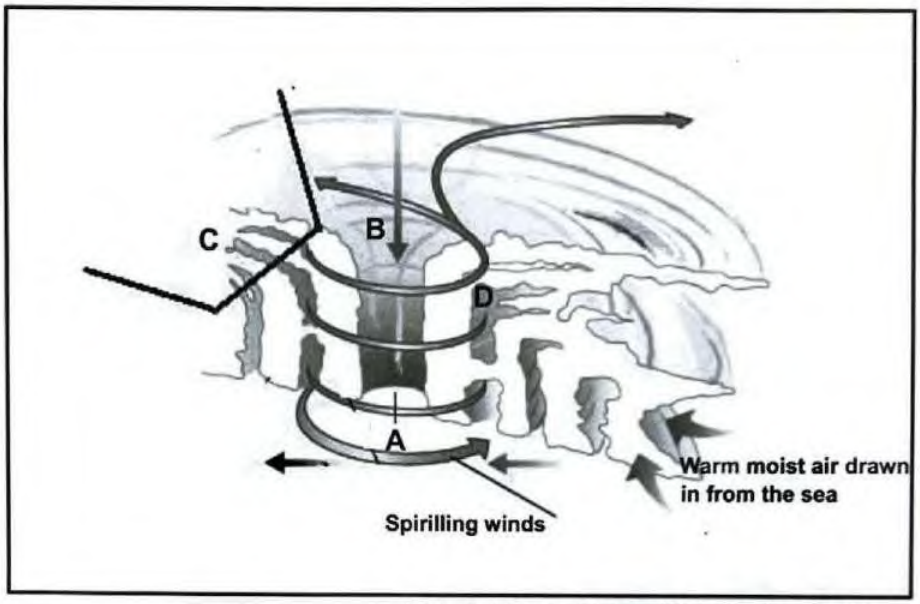
SPECIFIC INSTUCTIONS AND INFORMATION FOR SECTION B

14. A 1 : 50 00 topographical map 3126 DD QUEENSTOWN and a 1 : 10 000 orthophoto map 3126 DD 1 NOOITGEDACHT are provided.
15. The area demarcated in RED/BLACK on the topographical map represents the area covered by the orthophoto map.
16. Marks will be allocated for steps in calculations.
17. The topographical and orthophoto map must be handed in to the invigilator at the end of this examination session.

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

1.1 Refer to the sketch below. Choose the term/concept from COLUMN B that completes the statement in COLUMN A. Write down only **Y** or **Z** next to the question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, e.g. 1.1.8 Y.



[Adapted from *Merriam Webster, Inc*, 2006]

COLUMN A		COLUMN B	
1.1.1	The weather system shown in the sketch is a … cyclone.	**Y.**	tropical
		Z.	mid-latitude
1.1.2	The sketch above represents a cyclone in the … hemisphere	**Y.**	southern
		Z.	northern
1.1.3	**A** in the sketch is referred to as the … of the cyclone.	**Y.**	apex
		Z.	eye
1.1.4	The air descending at **B** is …	**Y.**	moist
		Z.	dry
1.1.5	Area **C** in the sketch represents the … of the cyclone.	**Y.**	dangerous semi-circle
		Z.	cold sector
1.1.6	The cloud type found at **D** is …	**Y.**	cumulonimbus
		Z.	stratus
1.1.7	The general movement of this weather system is …	**Y.**	east to west
		Z.	west to east

(7 x 1) (7)

1.2.4 Berg winds occur as a result of the interaction between the … and … pressure systems.

(i) Kalahari high
(ii) Cut-off low
(iii) South Indian high
(iv) Coastal low

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

1.2.5 The two winds responsible for the development of line thunderstorms are the … winds.

A south westerly and north westerly
B north westerly and south easterly
C north easterly and south westerly
D south westerly and north westerly

1.2.6 A zone between two air masses with different water vapour content, resulting in the occurrence of line thunderstorms known as a …

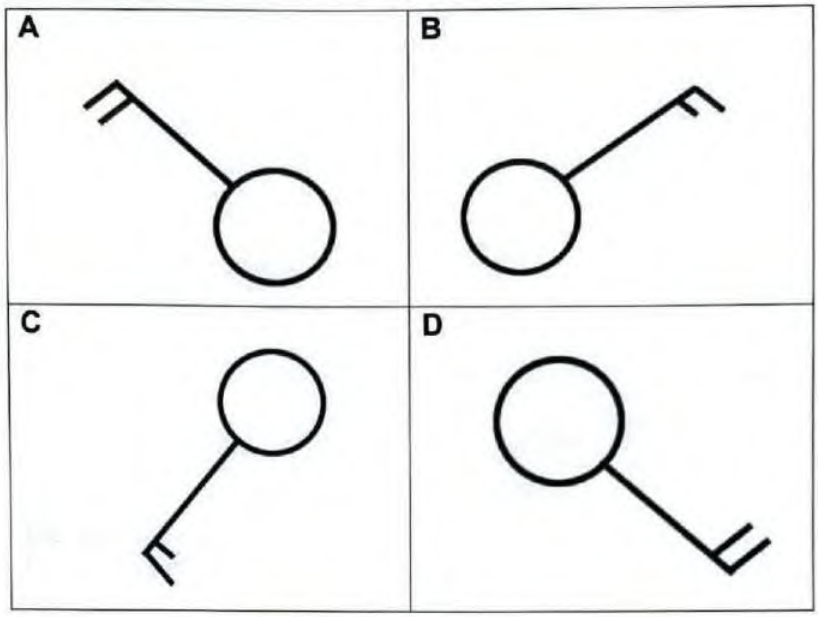
A cold front.
B moisture front.
C warm front.
D polar front.

1.2.7 Line thunderstorms are associated with the following weather conditions:

A torrential rain; snow
B hurricane winds; hail
C light rain; thunder
D torrential rain; gusty winds

1.2 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 (1.2.1 to 1.2.8) in the ANSWER BOOK, example 1.2.9 D.

1.2.1 A south westerly wind of 15 knots is evident in …



1.2.2 Cyclones are associated with … weather conditions and … of air.

(i) unstable
(ii) stable
(iii) divergence
(iv) convergence

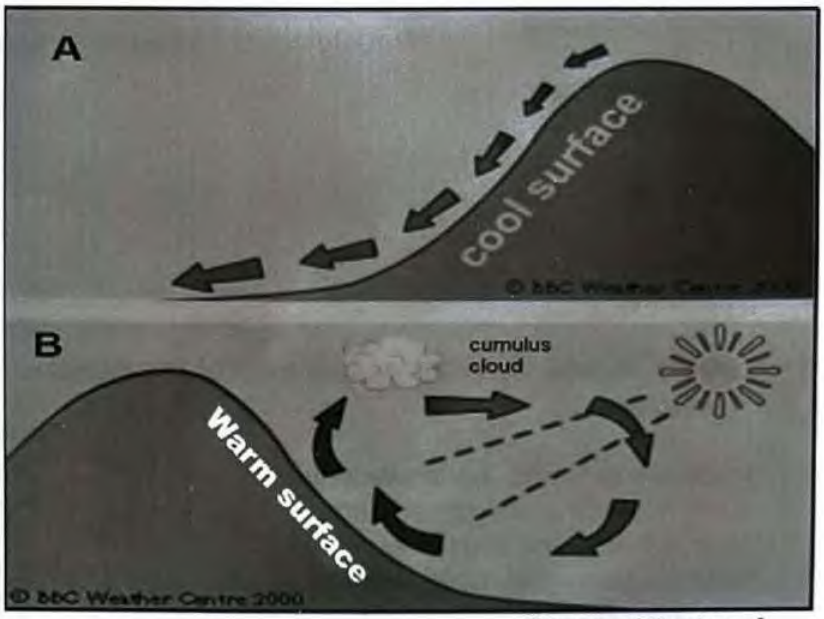
A (i) and (iii)
B (i) and (iv)
C (ii) and (iii)
D (ii) and (iv)

1.2.3 Berg winds are … and … gusty local winds that blow from the interior of the country to the coast.

(i) hot
(ii) warm
(iii) dry
(iv) moist

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

1.2.8 The micro-climate illustrated in the sketches below, shows ... (**A**) and ... (**B**) winds respectively.



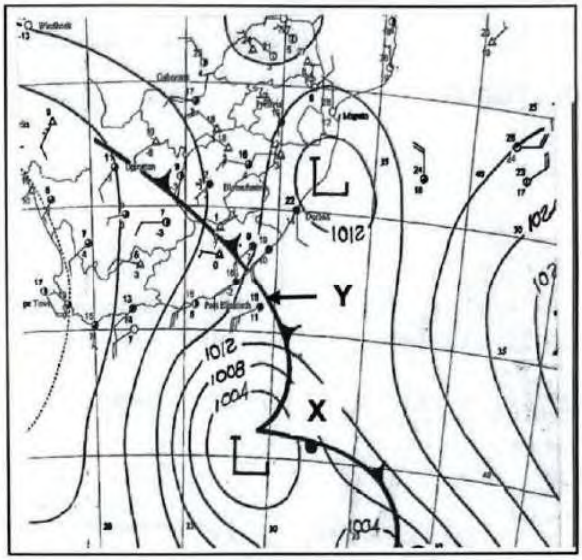
[Source: pintrest.com]

(i) anabatic
(ii) westerlies
(iii) katabatic
(iv) easterlies

A (i) and (iiii)
B (i) and (iv)
C (ii) and (iii)
D (iii) and (i)

(8 x 1) (8)

1.3 Refer to the infographic showing a mid-latitude cyclone.



As the cold front moves over the central and south-eastern parts of South Africa today, it has left a trail of heavy falls, very cold conditions, very rough seas and gale force winds over the interior and along the coast. At present the cold front is positioned over the Eastern Cape, bringing heavy rain and very cold temperatures to the province. Snowfalls are expected on the mountains of the Eastern Cape today, as well as in Lesotho, the Drakensberg and the eastern Free State overnight and tomorrow. Sea conditions remain very hazardous, with gale force winds and very rough seas persisting along the southern Cape coast today, spreading towards the Wild Coast and KwaZulu-Natal

Source: Adapted from South African Weather Services]

1.3.1 Provide evidence from the synoptic chart indicating that **X** is a mid-latitude cyclone. (1 x 1) (1)

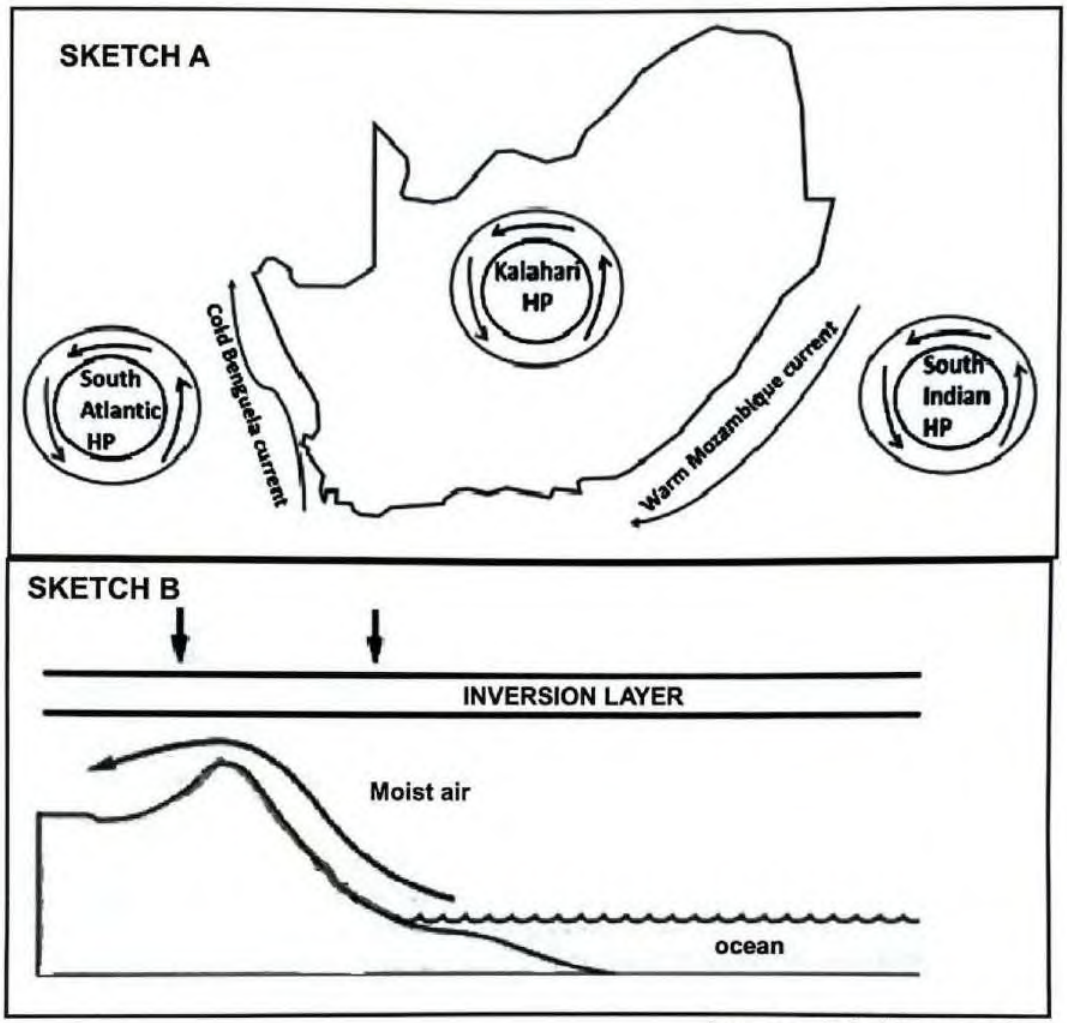
1.3.2 Give evidence from the satellite image and synoptic weather chart indicating that typical winter conditions are shown. (1 x 2) (2)

1.3.3 With reference to the satellite image and synoptic weather chart, explain why the Eastern Cape is experiencing rain and very cold conditions. (1 x 2) (2)

1.3.4 Draw a simple, free-hand cross section through the front labelled **Y**. Clearly indicate the position of the cold and warm air masses, and the main rain-bearing cloud associated with front **Y**. (4 x 1) (4)

1.3.5 With reference to the extract, suggest THREE ways how satellite tracking can assist farmers in the Eastern Cape, to prepare for the weather conditions associated with a mid-latitude cyclone. (3 x 2) (6)

1.4 Refer to **sketch A** and **sketch B** showing factors that influence the weather over South Africa in summer.



[source: mindset learn.com]

1.4.1 Identify ONE factor in sketch **A** that influences the weather of South Africa. (1 x 1) (1)

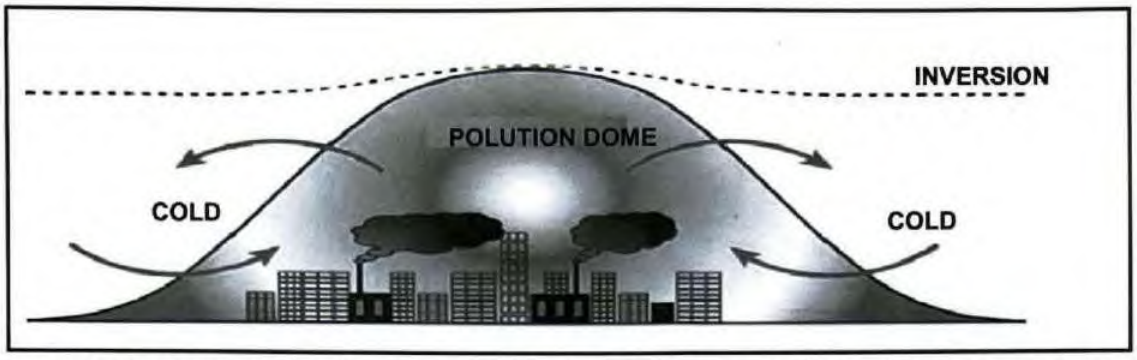
1.4.2 How would the position of the South Indian HP influence the moisture content of the air reaching the east coast of South Africa in summer? (1 x 2) (2)

1.4.3 Why is the Kalahari HP weakly developed over the land in summer? (1 x 2) (2)

1.4.4 How does the weakly developed Kalahari high pressure cell influence the presence of the inversion layer in sketch **B**? (1 x 2) (2)

1.4.5 In a paragraph of approximately EIGHT lines, explain how the position of the inversion layer will bring overcast and unstable weather conditions over the interior of the country in summer. (4 x 2) (8)

1.5 Refer to the sketch showing a pollution dome.



[Source: [http://www.ibgeographypods.org/uploads/7/6/2/2/7622863/ib_dp_geography_microclimates_urban_heat island_worksheet.pdf]

1.5.1 Give TWO reasons why pollution domes are common in most cities. (2 x 1) (2)

1.5.2 Give evidence from the sketch that suggests that this pollution dome is occurring at night. (1 x 1) (1)

1.5.3 Suggest a reason why pollution domes are more concentrated at night. (1 x 2) (2)

1.5.4 How do pollution domes increase temperature in a city? (1 x 2) (2)

1.5.5 Explain why the negative impact of pollution domes on people are greater in winter. (2 x 2) (4)

1.5.6 Provide sustainable strategies that can reduce the occurrence of pollution domes in our cities. (2 x 2) (4)
[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 A

2.1.1 The raised banks of a river subjected to repeated flooding and deposition is a/an …

A birdsfoot delta.
B alluvial fan.
C meander scar.
D natural levee.

2.1.2 Flat land on either side of the banks of a river made up of layers of silt is a …

A sand delta.
B natural levee.
C flood plain.
D sand island.

2.1.3 When a river enters the sea and deposit its load it forms a …

A delta.
B braided stream.
C sand island.
D flood plain.

2.1.4 This fluvial landform is popular with tourists who want to do river rafting.

A waterfalls
B valleys
C gorge
D rapids

2.1.5 The outer bank of a meander is called the … slope and has a … shape.

(i) slip-off
(ii) under cut
(iii) convex
(iv) concave

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

2.1.6 When a meander loop becomes separated from the river, it forms a/an … and when it dry up it is referred to as a/an …

(i) Yazoo stream
(ii) Ox-bow lake
(iii) Meander scar
(iv) Flood plain

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

2.1.7 A braided stream forms in the … course of the river when it deposits its load within its channel forming … islands.

(i) Lower
(ii) Upper
(iii) Sand
(iv) Rock

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

2.1.8 Where water plunges over a … cliff, it forms a …

(i) horizontal
(ii) rapid
(iii) vertical
(iv) Waterfall

A (iii) and (iv)
B (i) and (iv)
C (i) and (ii)
D (ii) and (iii) (8x1) (8)

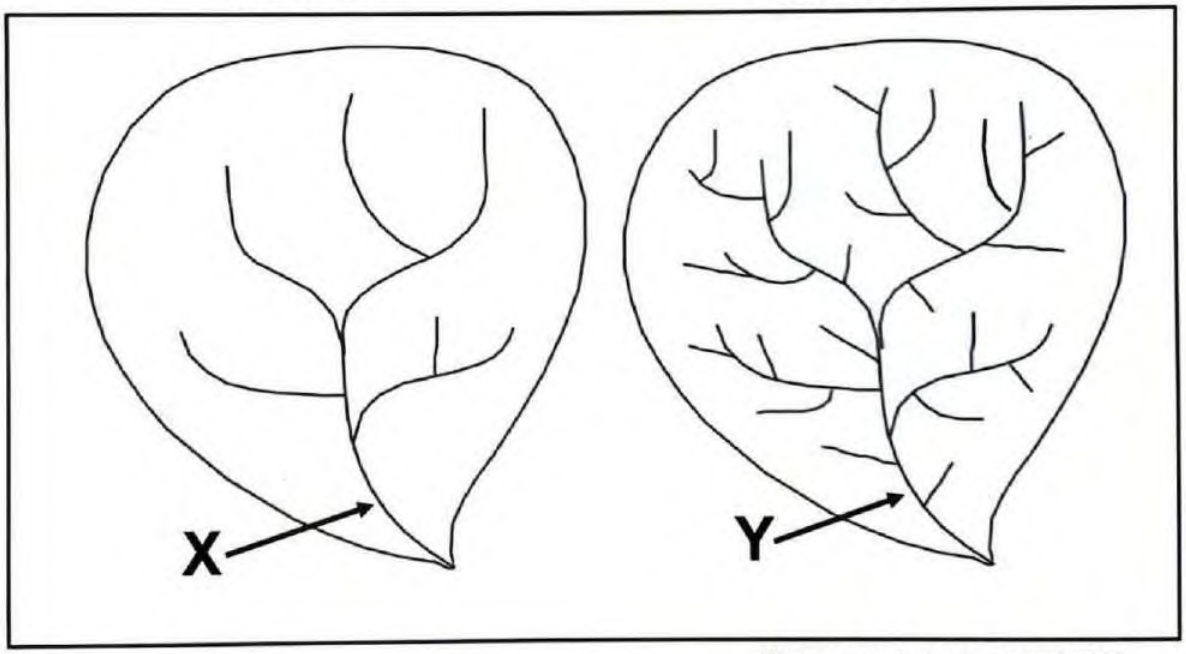
2.2 Complete the statements in COLUMN A with the options in COLUMN B. Write down only **Y** or **Z** next to the question numbers (2.2.1 to 2.2.7) in the ANSWER BOOK, e.g. 2.2.8 Y

COLUMN A	COLUMN B
2.2.1 High-lying areas that separates two drainage basins is known as …	**Y** interfluve **Z** watershed
2.2.2 Point where two or more streams meet is known as…	**Y** confluence **Z** tributary
2.2.3 Point where the river enters the sea is known as …	**Y** mouth **Z** source
2.2.4 The upper limit of ground water is known as …	**Y** base flow **Z** water table
2.2.5 The process whereby water seeps underground is known as …	**Y** run off **Z** infiltration
2.2.6 Area drained by a river and its tributaries is known as …	**Y** drainage basin **Z** drainage pattern
2.2.7 A river that originates in areas of high rainfall but flows through dry area is known as …	**Y** exotic **Z** episodic

(7x1) (7)

2.3 Refer to the drainage density illustrated in sketches **A** and **B** below.

SKETCH A **SKETCH B**



[Source: examiner's own sketch]

2.3.1 Explain the concept *drainage density*. (1x2) (2)

2.3.2 What evidence indicates that sketch **B** has a higher drainage density than sketch **A**? (1x2) (2)

2.3.3 Determine the stream order at **X** in the sketch **A**. (1x2) (2)

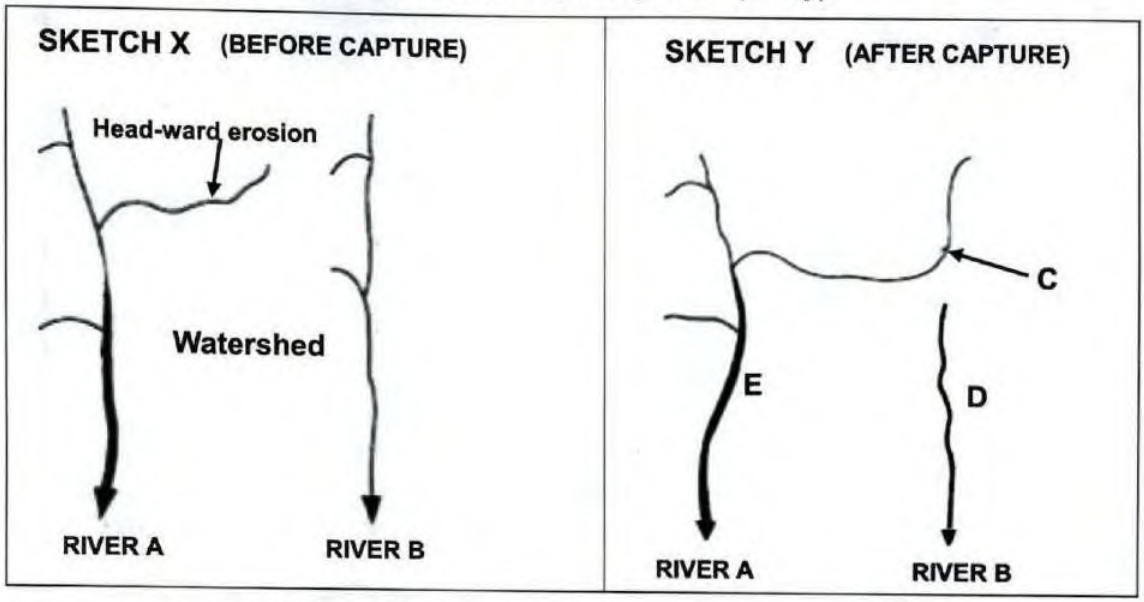
2.3.4 Why will the stream order be higher at point **Y** than point **X**? (1x2) (2)

2.3.5 Explain the influence of gradient (slope) on drainage density. (2x2) (4)

2.3.6 Identify the drainage pattern in sketch **B**? (1x1) (1)

2.3.7 Give a reason for your answer to QUESTION 2.3.6. (1x2) (2)

2.4 Refer to the sketches below on river capture (stream piracy).



[Source: Adapted from https://www.ecurriculum.co.za/FET%20vanaf%20June%2020/12/5%20-Geography%20Grade%2012%20River%cap-ture%20PPT%27.pdf]

2.4.1 What evidence in sketch **X** indicates that river capture is likely to take place? (1x1) (1)

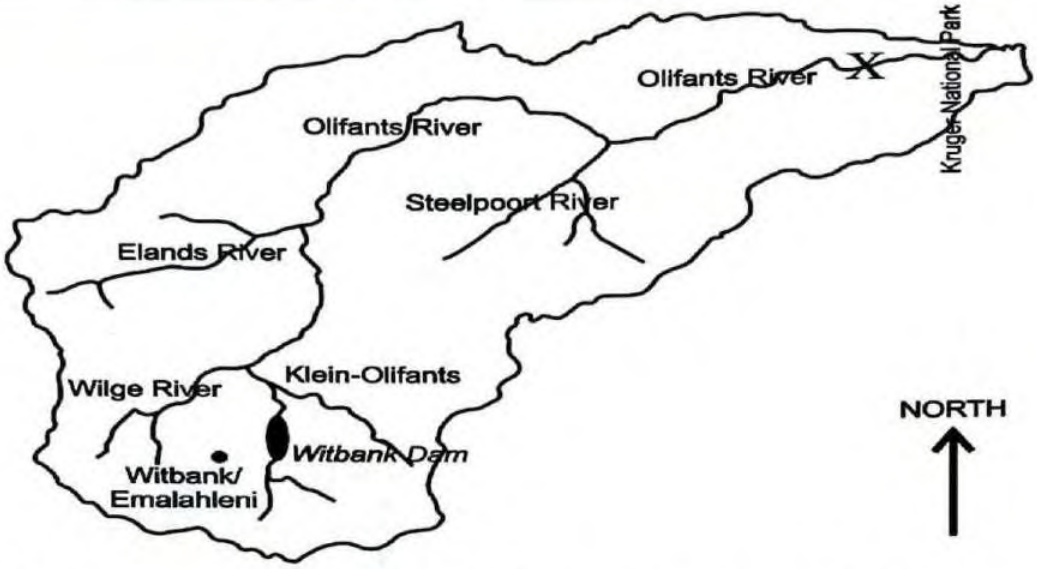
2.4.2 What could have caused the captor stream to erode through the watershed? (2x1) (2)

2.4.3 Identity features **C** and **D** of river capture in sketch **Y**. (2x1) (2)

2.4.4 Explain the process that resulted in the formation of feature **D**. (1x2) (2)

2.4.5 In a paragraph of approximately EIGHT lines, describe how the increased volume of water will positively impact on the farming community at **E** in sketch **Y**. (4x2) (8)

2.5 Refer to the map and fact file below, on the Oliphant's River Catchment Region in Mpumalanga and Limpopo province.



Total mean annual surface runoff of catchment area is approximately 2400 millioncubic meters per year. A minimum of 200 million cubic meters of water is required to keep the Oliphant's River flowing as it reaches the Kruger National Park in its lower course. In recent years the lower course of Olifants River has dried up for months at a time impacting upon the Kruger Park's wildlife and river ecosystem.

Due to the flat topography of the Highveld grasslands, there are many important wetlands systems within this catchment. The upper course of the catchment is characterized by mining, agricultural and conservation activities. Over-grazing and highly erodible soils result in severe erosion in this catchment. Thirty large dams occur in the Olifants River catchment, the Witbank Dam being one of them.

[Adapted from CSIR, River Health Programme]

2.5.1 With reference to the map, name TWO tributaries of the Oliphant's River. (2x1) (2)

2.5.2 Name ONE province across which the Olifants River catchment region spans (spreads). (1x1) (1)

2.5.3 Suggest a reason why the Olifants River dries up for months at a time. (1x2) (2)

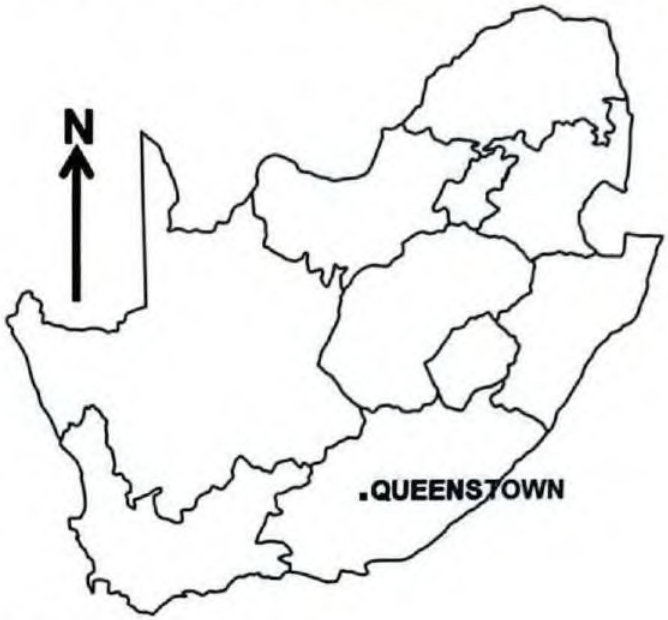
2.5.4 Identify and explain THREE ways in which people have negatively impacted on the Oliphant's drainage basin. (3x2) (6)

2.5.5 Suggest TWO strategies that can be put in place to ensure the river discharge remains above 200 million cubic meters to enable the lower stages of the Oliphant's River to support life in the Kruger Park. (2x2) (4)

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON QUEENSTOWN



Coordinates:31°54'S;26°53'E

Queenstown (officially known as Komani) is a town in the Eastern Cape in South Africa. The town lies on the banks of Komani River which forms part of the great Kei river system and has a refreshing climate and an abundant water supply from the surrounding rugged mountains.

The area's annual average temperature is 18.29°C which is 2.93% lower than the average for South Africa. Queenstown generally receives approximately 90.83 millimetres of precipitation and has 134 rainy days annually.

Winters are short, cold, dry and windy; it is mostly clear year-round.

[Adapted from https://en.wikipedia.org/wiki/Queenstown]

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

ENGLISH	AFRIKAANS
Diggings	Uitgrawings
River	Rivier

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 The difference in altitude between the trigonometrical beacon 270 in block **B2** and spot height 1756 in block **A4** is ... metres.

A. 3562.2
B. 1486
C. 50.2
D. 5.2 (1 x 1) (1)

3.1.2 The scale of 1: 10 000 shows a ... area and ... detail as it is a larger scale than the scale of 1: 50 000.

(i) larger
(ii) smaller
(iii) less
(iv) more

A (i) and (iv)
B (i) and (iii)
C (ii) and (iii)
D (ii) and (iv) (1 x 1) (1)

3.1.3 The physical feature located north east of the reservoir **D4** is a/an ...

A escarpment
B mesa
C plateau
D hill (1 x 1) (1)

3.1.4 Calculate the straight-line distance between point **7 (D2)** and point **6 (D4)** on the orthophoto map in km.

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

3.1.5 The true bearing from spot height 1493, in block **C4**, to spot height 1313, in block **D2**, on the topographical map is ... (1 x 1) (1)

3.1.6 Calculate the magnetic declination of Queenstown for 2024. Use the information and steps given below.

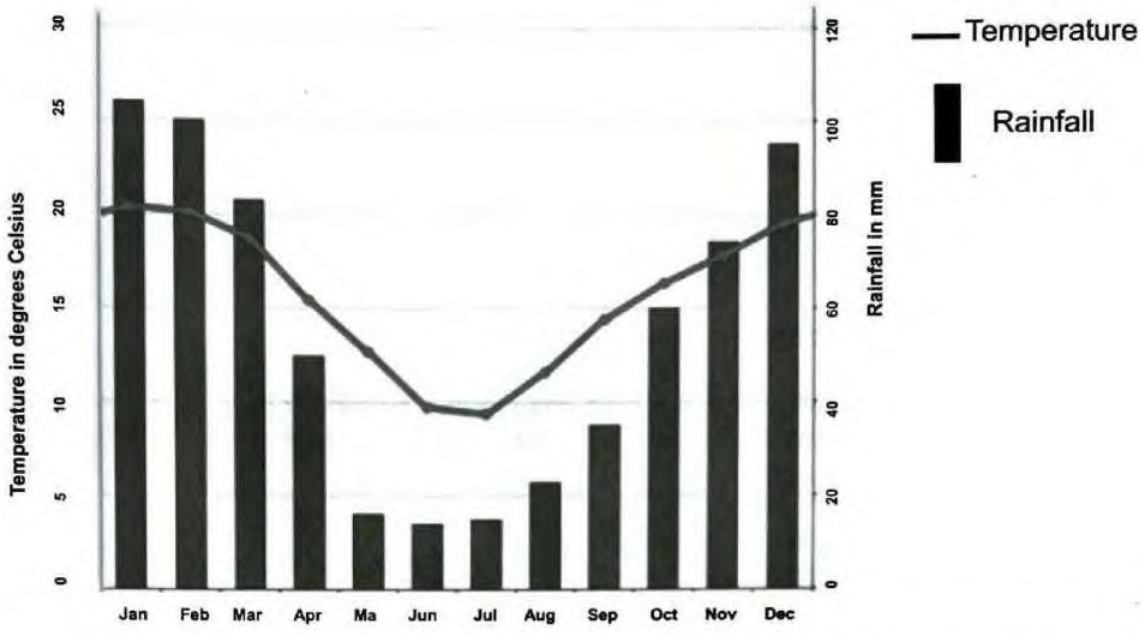
Difference in years : 7 years
Mean annual change : 10' Westwards
Total Change :
Magnetic Declination for 2024 : (3 x 1) (3)

3.1.7 Use the answer to QUESTIONS 3.1.5 and 3.1.6 above to calculate the magnetic bearing for 2024.

Formular: **Magnetic bearing = True bearing + magnetic declination** (1 x 1) (1)

3.2 MAP INTERPRETATION

Refer to the seasonal rainfall graph and the temperature graph and the topographic map of Queenstown.



[source:https://www.google.co.za/search?client=safari&sca_esv=df95c88c09499125&channel=iphone_bm&q=rainfall+graph+of+queenstown&tbm=isch&source=lnms&prmd=invsmbtz&sa=X&ved=2ahUKEwja_LrR48OEAxV4R0EAHTQaCSUQ0pQJegQICRAB&biw=430&bih=739&dpr=3#imgrc=-4Q_W0VWGNWYXM]

3.2.1 (a) In which season is the lowest rainfall experienced in Queenstown? (1 x 1) (1)

(b) Identity the type of river which indicates that Queenstown receives seasonal rainfall. (1x1) (1)

(c) Explain ONE strategy in block B4 that has been implemented to overcome water shortages. (1x 2) (2)

(d) Which month receives the lowest temperature in Queenstown? (1x1) (1)

(e) Explain the relationship between temperature and rainfall for the month of June and July in Queenstown. (1x2) (2)

3.2.2 Identify the environmental problem evident (shown) in block **C1** on the topographical map. (1x1) (1)

3.2.3 What strategies can be implemented by relevant authorities to overcome this problem? (2x2) (4)

3.3 GEOGRAPHICAL INFORMATION SYSTEM (GIS)

Refer to the spatial object in blocks **D1** and **E2** on the topographic map.

3.3.1 Give an example of the following:

(a) A natural line feature in block **D1**. (1x1) (1)

(b) A human-made polygon feature in block **E2.** (1x1) (1)

3.3.2 State TWO attributes of the polygon feature identified in QUESTION 3.3.1. (b) (2x1) (2)

3.3.3 Define the concept *remote sensing.* (1x2) (2)

3.3.4 Explain how remote sensing images can be more effective in assessing the environmental issue in block **C1** than the topographic map. (1x2) (2)

[30]

GRAND TOTAL: 150