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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION

# NATIONAL SENIOR CERTIFICATE

## GRADE 12

## GEOGRAPHY PAPER 1

## SEPTEMBER 2026

**MARKS: 150**

**TIME: 3 hours**

PEGEOGP1

**This question paper consists of 20 pages**

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## 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 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 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., 1020hPa, 14°C and 45 m.
11. You may use a non-programmable calculator'
12. You may use magnifying glass.
13. Write neatly and legibly.

## SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

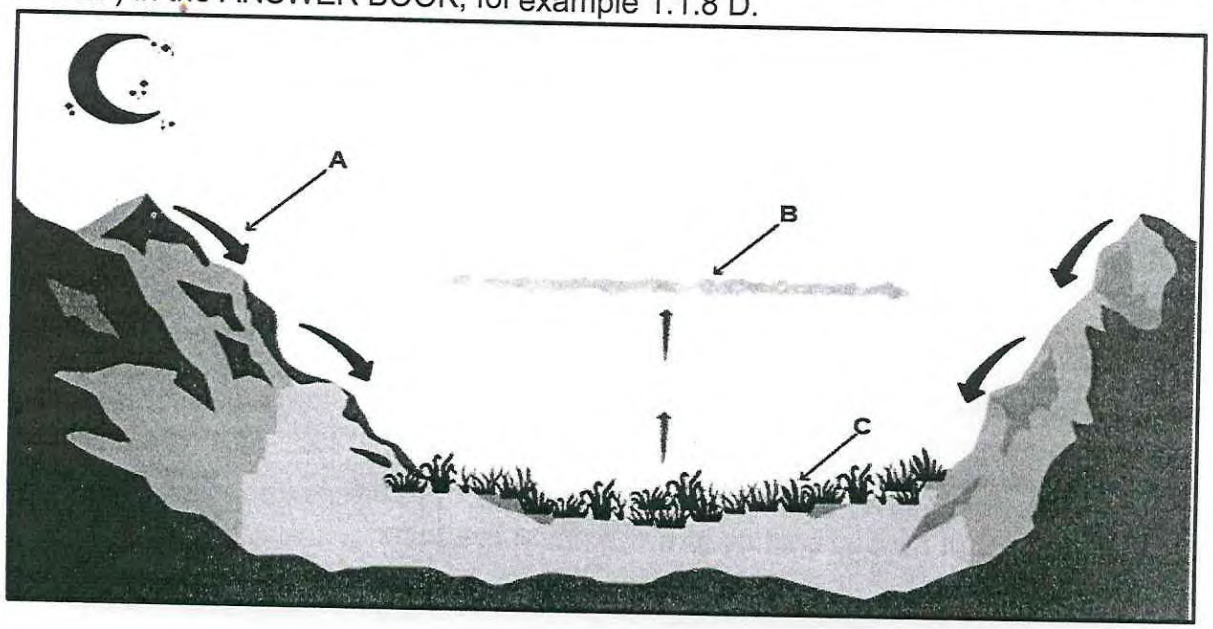
14. A 1:50 00 topographical map 2930 CA MERRIVALE and 1: 10 000 ORTHOPHOTO MAP EXTRACT FROM 2930 CA 5 MERRIVALE are provided.
15. The area demarcated in RED/BLACK on the topographical map represents the area covered by the orthophoto map.
16. Show ALL calculations. Marks will be allocated for steps in calculations.
17. You must hand in the topographical and orthophoto map to the invigilator at the end of this examination session.

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## 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 number (1.1.1 – 1.1.7) in the ANSWER BOOK, for example 1.1.8 D.




[Source: Examiner's own sketch]

1.1.1 Air mass rising towards layer **B** is ...

A heavy and dry

B. heavy and moist

C. lighter and dry

D lighter and moist

1.1.2 Wind **A** occurs during the ... when air becomes ... and dense

(i) day

(ii) night

(iii) cold.

(iv) hot.

A (i) and (iii)

B (i) and (iv)

C (ii) and (iii)

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D (ii) and (iv)

1.1.3 The type of fog that forms at **C** during the night.

A advection fog

B precipitation fog

C radiation fog

D upslope fog

1.1.4 A layer of warm air at **B** is called…

A upslope wind

B thermal belt

C inversion layer

D downslope wind

1.1.5 The force that causes cold air to move down the slope.

A Coriolis force

B force of gravity

C Pressure gradient force

D Friction

1.1.6 The positive impact of the fog at **C** on vegetation is...

A increasing moisture levels available to plants.

B Frost pockets destroy vegetation.

C reduces plants photosynthesis in the morning.

D only frost-resistant crops can be grown.

1.1.7 Wind **A** intensifies during winter due to …

A Greater density differences

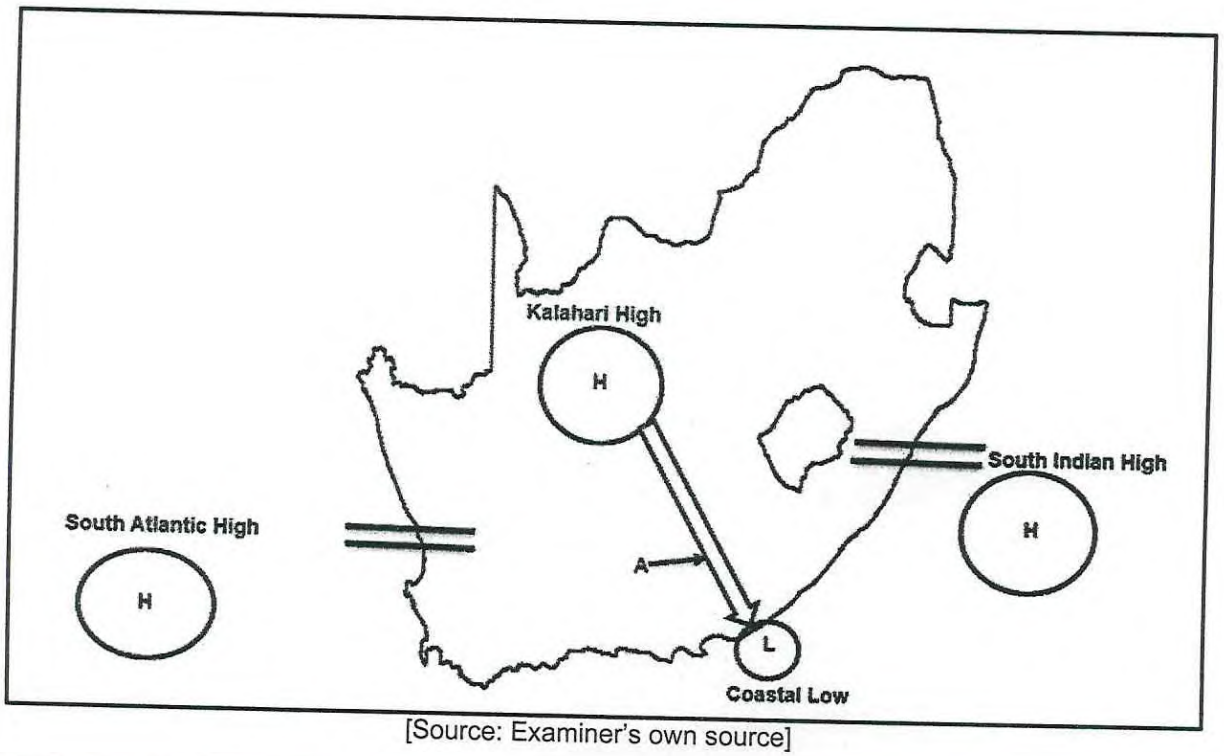
B Increased weather conditions

C High land temperatures

D Decrease atmospheric cooling

(7 x 1) (7)

1.2 Refer to the diagram below on Anticyclones and choose a term/words in COLUMN B that matches the description in COLUMN A. Write only the Letter (X or Y) next to the question number (1.2.1 – 1.2.8) in the ANSWER BOOK, for example 1.2.9 Y.




[Source: Examiner's own source]

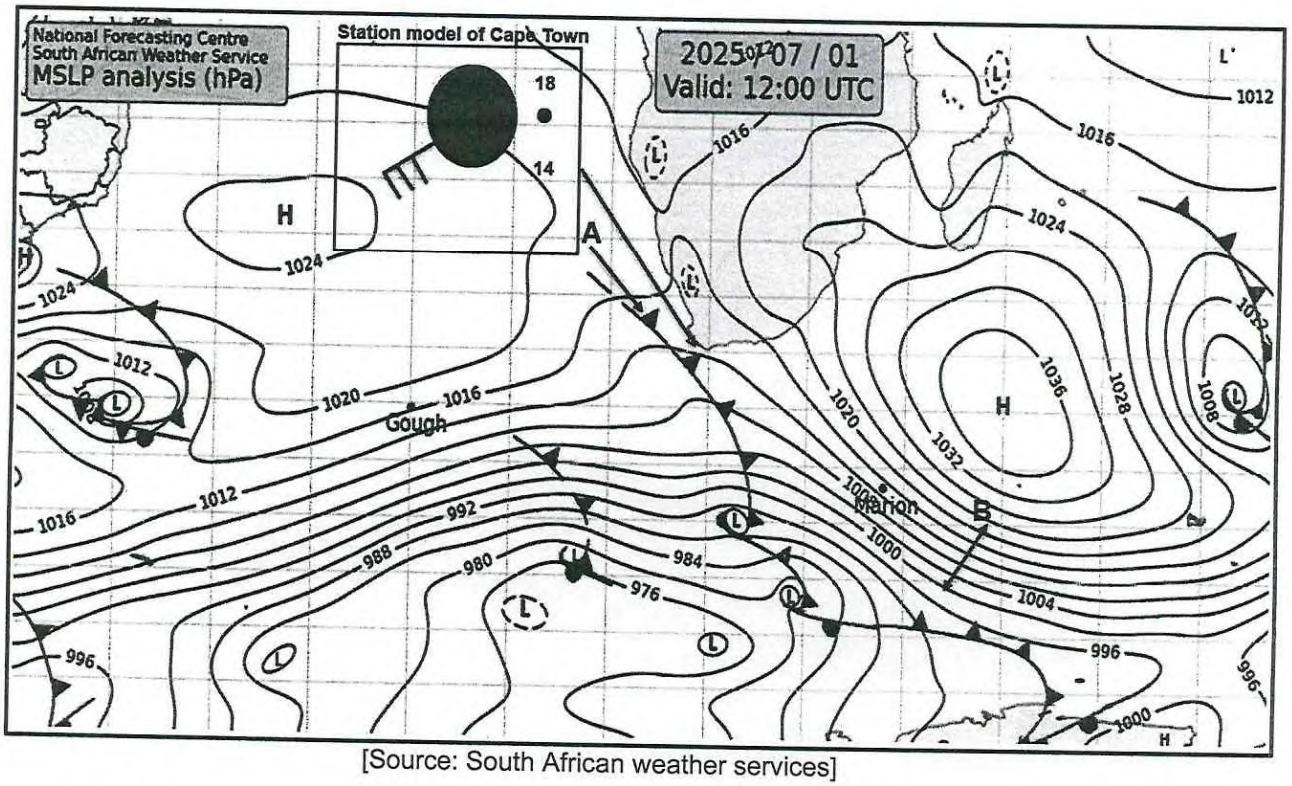
| COLUMN A | COLUMN B |
|---|---|
| 1.2.1 The ... causes wind by pushing air from areas of high atmospheric pressure to areas of low atmospheric pressure. | **X** pressure gradient<br>**Y** pressure gradient force |
| 1.2.2 Kalahari, South Atlantic and South Indian high-pressure cells are part of this pressure belt. | **X** subtropical high-pressure belt<br>**Y** sub-polar high-pressure belt |
| 1.2.3 Kalahari high is weakly developed over Southern Africa during ... | **X** winter<br>**Y** summer |
| 1.2.4 The ... brings relatively dry, cool and stable Air from the southwest to interior of South Africa | **X** South Atlantic High<br>**Y** South Indian High |
| 1.2.5 During development of berg winds, cold dry air ... from Kalahari high in anticlockwise to the coastal low. | **X** converges<br>**Y** diverges |
| 1.2.6 ... causes the onshore and offshore air flow along the coast of South Africa during winter. | **X** Kalahari high<br>**Y** Coastal low |
| 1.2.7 Wind **A** ... vegetation as it blows down the escarpment. | **X** destroys<br>**Y** improves |
| 1.2.8 Air circulation is anticlockwise around a ... in the southern hemisphere | **X** low pressure cell.<br>**Y** high pressure cell. |

(8 x 1) (8)

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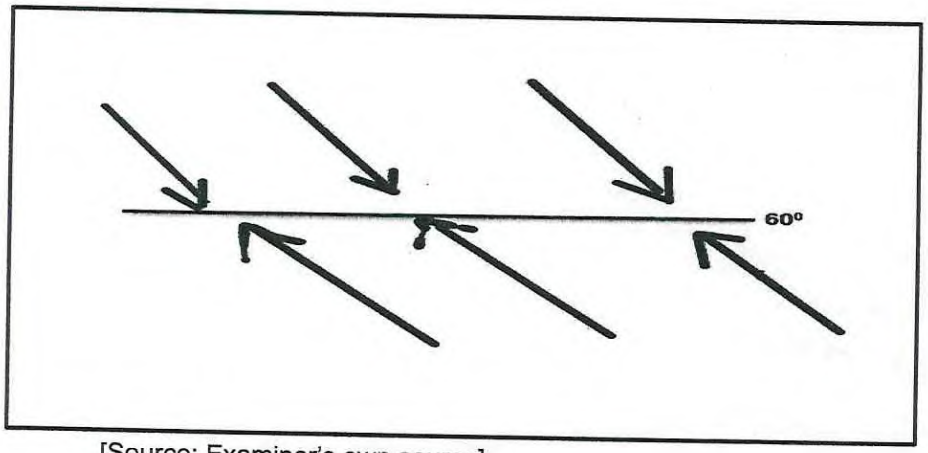
1.3 Refer below to the synoptic weather map of South Africa.

**Source A**




[Source: South African weather services]

**Source B**




[Source: Examiner's own source]

1.3.1 State the general direction of movement of mid-latitude cyclone.

(1 x 1) (1)

1.3.2 Account for the heavy rainfall experienced at Cape Town as front **A** approaches.

(1 x 2) (2)

Refer source **B**

1.3.3 Discuss the role played by the polar front in the development of mid-latitude cyclones. (2 x 2) (4)

1.3.4 In a paragraph of approximately EIGHT lines, explain how thunderstorms and gusty winds associated with a cold front negatively impact on tourist in Cape Town. (4 x 2) (8)

1.4 Refer to the infographic below showing Tropical Cyclone Gezani.

**A: EXTRACT OF TROPICAL CYCLONE GEZANI**

Intense tropical cyclone Gezani was a deadly, long-lived and destructive tropical cyclone that affected parts of Madagascar and Mozambique, particularly Toasmasma as an intense tropical cyclone. It was the third tropical cyclone of the 2025 – 26 South-West Indian Ocean cyclone season. The cyclone formed on 4 February 2026 and reached Madagascar on the 10 February 2026. Gezani left at least 63 people dead, including 59 in Madagascar, 804 others injured and 15 missing, alongside 16, 000 being displaced.

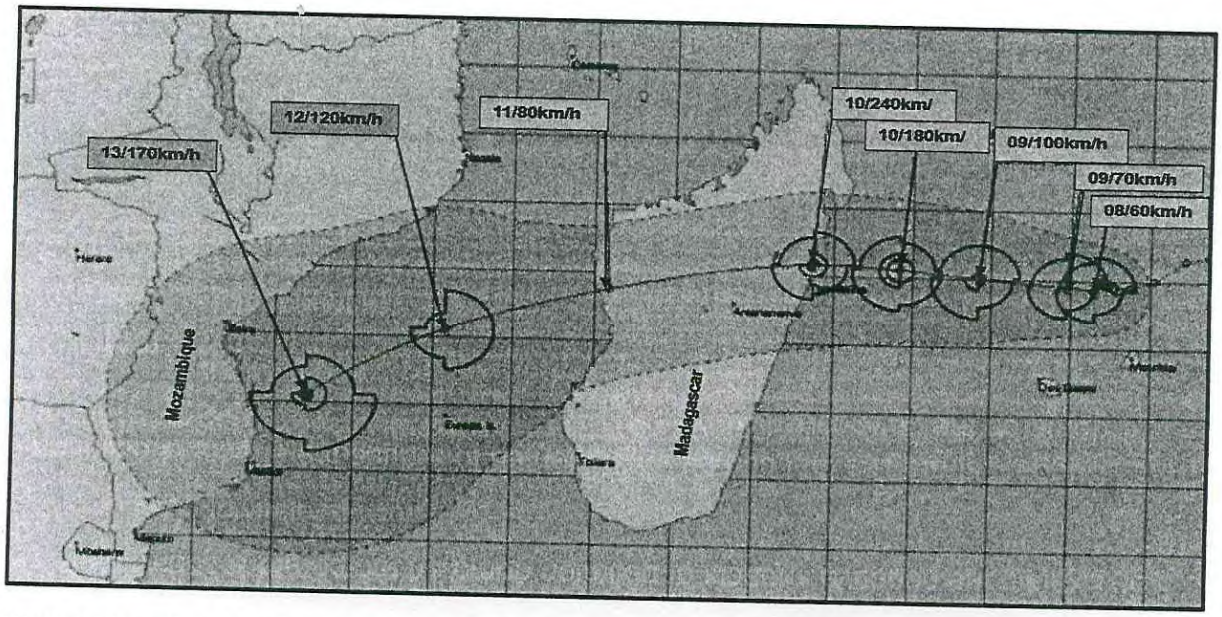
[Source: en.wikipedia.org/wiki/Cyclone_Gezani]

**B: SATELLITE IMAGE AND IMPACTS**




[Source: SRIRAM'S IAS]

## C: PATH OF CYCLONE GEZANI




[Source:timeslive.co.za/news/south-africa/2026-02-09]

1.4.1 Identify the stage of tropical cyclone Gezani in Extract **A** on the 10th of February 2026 in Madagascar. (1 x 1) (1)

1.4.2 Support your answer to QUESTION 1.4.1. (1 x 1) (2)

1.4.3 State the latitudinal area of formation of tropical cyclones. (1 x 1) (1)

1.4.4 Refer to the satellite image and impacts at **B**.

(a) Tropical cyclone Gezani is steered by … (westerly/ easterly) winds. (1 x 1) (1)

(b) Explain the negative impacts of tropical cyclone Gezani as observed in the picture. (1 x 2) (2)

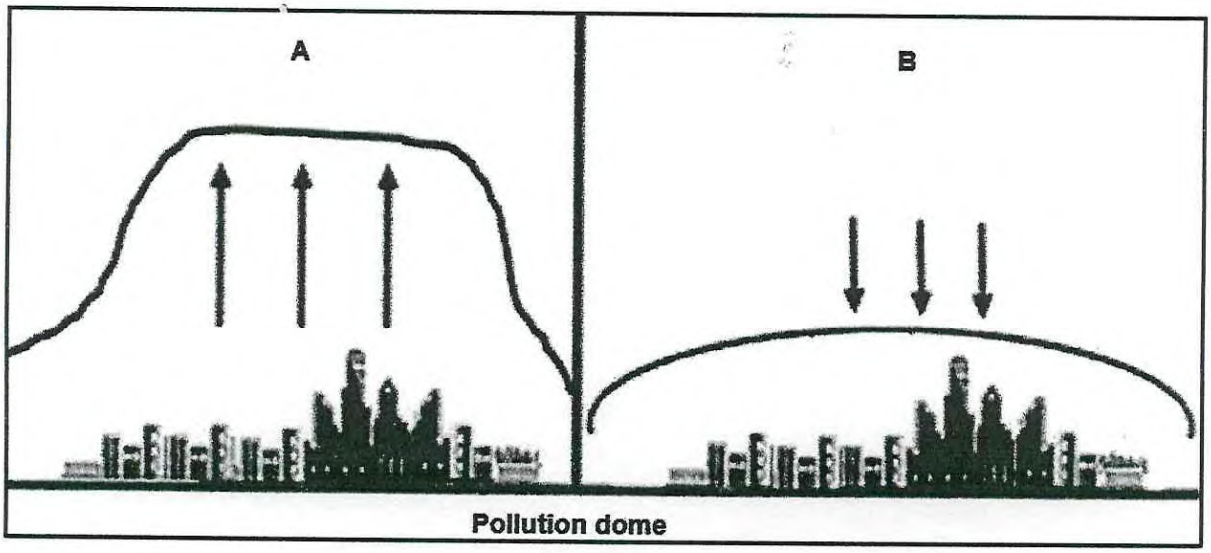
1.4.5 Refer to Source **C**

(a) Explain why tropical cyclone Gezani increased in intensity between Madagascar and Mozambique. (2 x 2) (4)

(b) Suggest precautionary measures that people can employ to minimise the impacts of tropical cyclone Gezani. (2 x 2) (4)

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1.5 Refer to the sketch below showing Pollution dome




[Adapted from: www.education.gov.za]

1.5.1 The concept used to describe a trapped mass of polluted air, smog and dust over urban areas is called ... (1 x 1) (1)

1.5.2 Give ONE of the causes of the concept described in QUESTION 1.5.1

(1 x 1) (1)

1.5.3 Diagram (**A/B**) represents a compressed pollution dome over the city.

(1 x 1) (1)

1.5.4 Why is the pollution dome in QUESTION 1.5.3 strongly developed during winter? (1 x 2) (2)

1.5.5 Explain the negative impacts of pollution dome on temperature and rainfall.

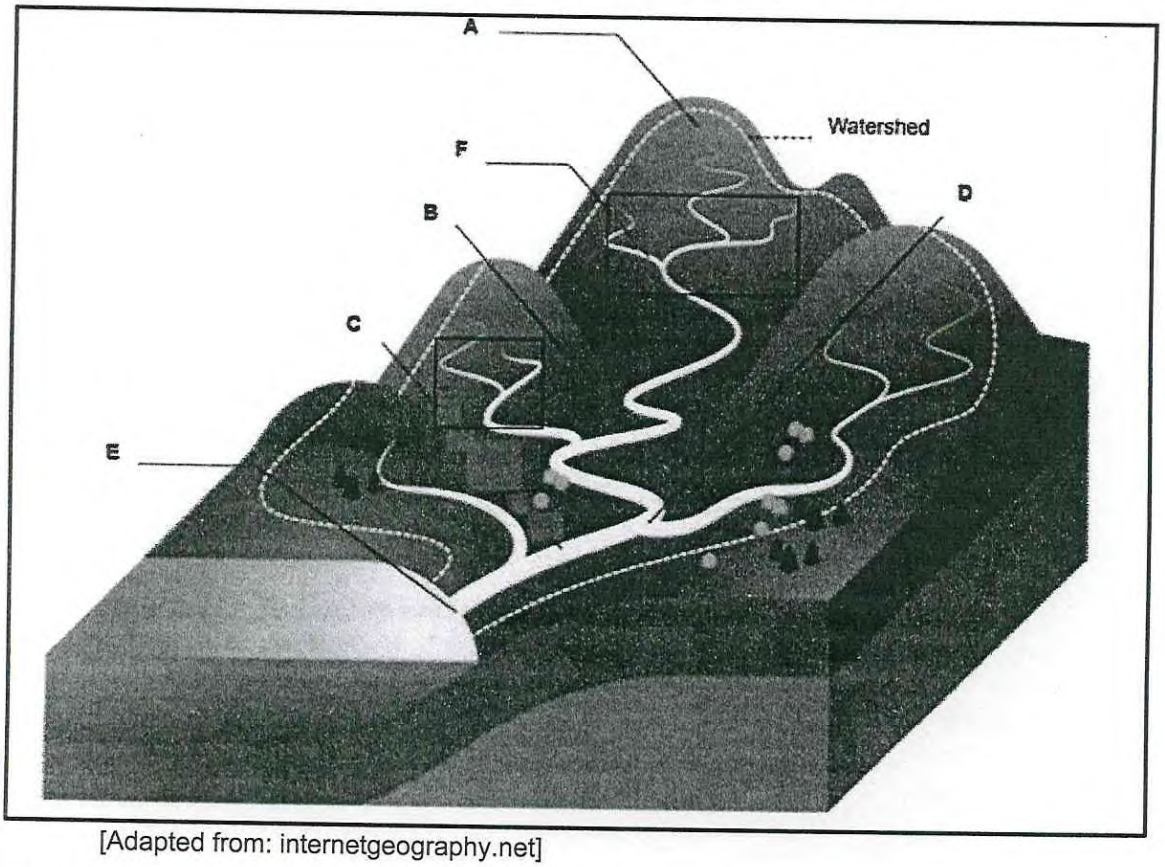
(2 x 2) (4)

1.5.6 Suggest strategies that can be implemented to reduce the effects of pollution dome on the physical environment. (3 x 2) (6)

**[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 E




[Adapted from: internetgeography.net]

2.1.1 The area at **A** where a river starts is called …

A. river mouth

B. river source

C. river system

D. drainage basin

2.1.2 The elevated land at **B** that separates streams in the same drainage basin is a/an …

A. watershed

B. interfluve

C. confluence

D. tributary

2.1.3 Smaller streams in **C** are classified as … order streams

A. first

B. second

C. third

D. fourth

2.1.4 The point at **D** where two or more rivers join is called...

A. river mouth

B. river source

C. confluence

D. tributary

2.1.5 Water that seeps into the ground after rainfall is …

A. ground water

B. infiltration

C. interfluve

D. surface runoff

2.1.6 Water table cannot remain constant throughout the year due to …

A. drainage density

B. upper level

C. saturated zone

D. seasonal rainfall

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2.1.7 Volume of water at **D** is … and the stream channels are …

(i) low

(ii) high

(iii) deep

(iv) shallow

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

2.1.8 Point **E** is known as a … and the river process there is …

(i) river mouth

(ii) river source

(iii) deposition

(iv) erosion

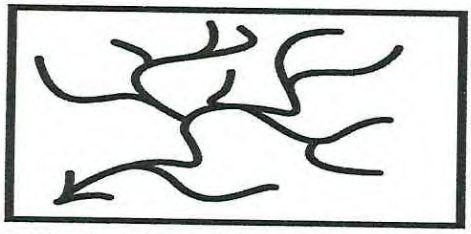
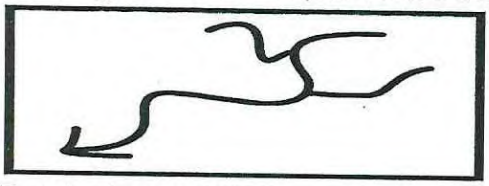
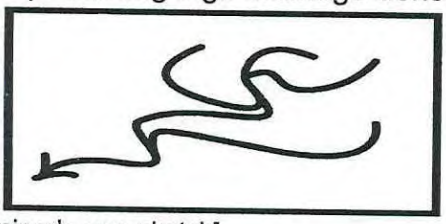
A. (i) and (iii)
B. (ii) and (iv)
C. (ii) and (iii)
D. (i) and (iv)

(8 x 1) (8)

2.2 Refer to the sketch below based on drainage density and drainage patterns. Complete the statements in COLUMN A with the options in COLUMN B. Write only **Y** or Z next to the question numbers (2.2.1 to 2.2.7) in the ANSWER BOOK, e.g. 2.2.9 **Y**

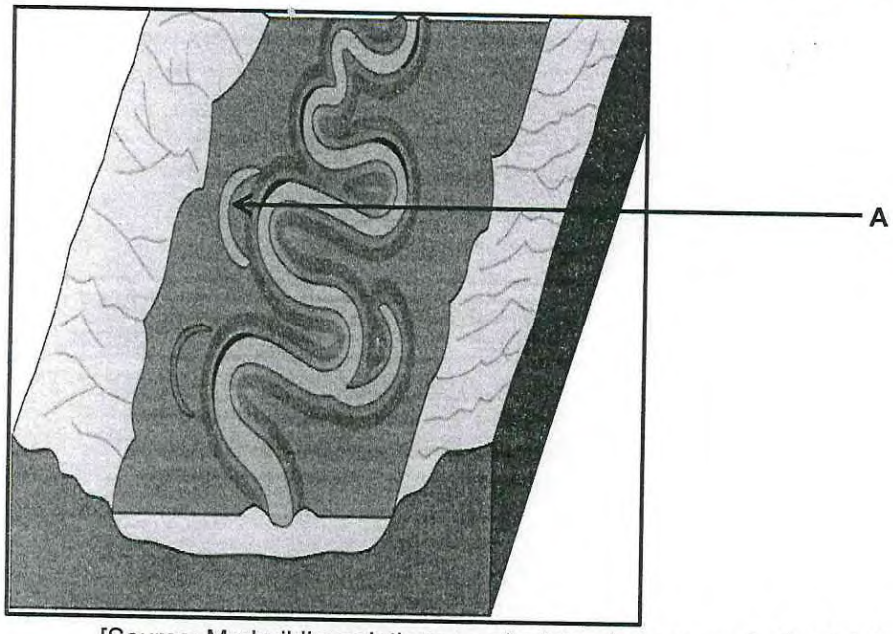
| **COLUMN A** | **COLUMN B** |
|---|---|
| 2.2.1 The measure of the total length of streams per unit area is … | **Y** drainage density<br>**Z** drainage pattern |
| 2.2.2 The … increase the amount of runoff and rate of erosion causing higher drainage density | **Y** gentle slopes<br>**Z** steeper slopes |
| 2.2.3 Lots of vegetation cover promote … infiltration which affects the drainage density. | **Y** less<br>**Z** more |
| 2.2.4 When the soil has … content, it promotes more run off | **Y** high moisture<br>**Z** low moisture |
| | |

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| | |
|---|---|
| 2.2.5 The sketch below shows drainage pattern with many steams, due to …<br><br>[Examiner's own sketch] | **Y** steep gradient<br>**Z** gentle gradient |
| 2.2.6 The river flows in places that experience a dry climate and higher infiltration, therefore the density will be …<br><br>[Examiner's own sketch] | **Y** lower<br>**Z** higher |
| 2.2.7 The surface area is covered with ... rocks thus promoting high drainage density on the surface.<br><br>[Examiner's own sketch] | **Y** porous<br>**Z** non-porous |

(7 x 1) (7)

2.3 Refer to the sketch below showing the ox-bow lake and floodplain




[Source: Marbuildingsolutions.com/building-in-kansas-city-floodplains]




[Source: google.com/search?]

2.3.1 Floodplains are usually found along the (lower/upper) course of a river.

(1 x 1) (1)

2.3.2 Identify the features labelled **A** and **B** on the sketches. (2 x 1) (2)

2.3.3 Describe the relationship between erosion and deposition in the formation of floodplain. (1 x 2) (2)

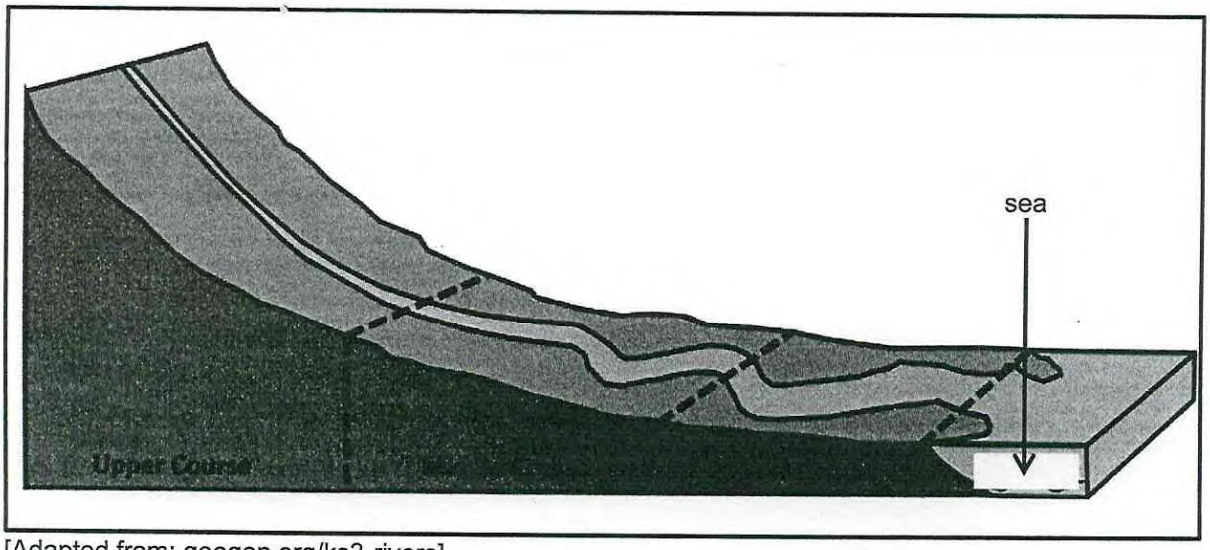
2.3.4 Explain the process of formation of an ox-bow lake. (2 x 2) (4)

2.3.5 Explain the impacts of floodplains on the physical environment.

(3 x 2) (6)

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2.4 Refer to the sketch on river profile




[Adapted from: geogon.org/ks3-rivers]

2.4.1 Define the concept *longitudinal profile.* (1 x 2) (2)

2.4.2 A/an (graded/ungraded) profile develops when there are no obstacles along the channel. (1 x 1) (1)

2.4.3 Why does vertical erosion occur in the upper course? (1 x 2) (2)

2.4.4 Draw a labelled plan view of the longitudinal profile. Indicate the following on the sketch:

(i) source

(ii) mouth

(iii) view shape

(iv) correct plan (1 x 4) (4)

2.4.5 Differentiate the characteristics of river profiles in the upper and the lower course. Refer to the shape of slope, type of erosion and flow pattern.

(3 x 2) (6)

2.5 Refer to the text below on river pollution

**POLLUTION IMPACTS AQUATIC ECOSYSTEMS, SPECIES AND ECONOMIC ACTIVITY**

Pollution is putting more pressure on South Africa's rivers, wetlands, estuaries, groundwater and marine ecosystems. These are findings from the National Biodiversity Assessment (NBA) 2025, being launched on 9 December 2025.

The findings highlight that pollution is building up faster than the system can clean them, and water quality is becoming worse in several areas across the country. Species such as fishes and water birds groups are declining locally. This is due to plastics, pesticides, untreated or poorly treated sewage, dirty storm water from towns and cities, and waste from farms and industries.

Places like Lake Sibaya, coral reefs and submarine canyons are highly affected. Rural and urban areas continue to dump litter in rivers. This causes a decrease in water quality for drinking and industrial use. Natural balance of rivers, wetlands and coastal systems are disrupted.

[Adapted from:sanbi.org/pollution-impacts-aquatic-ecosystems-species-and-economic-activity/]

2.5.1 List TWO areas that are highly affected by river pollution from the extract? (2 x 1) (2)

2.5.2 Describe the negative impact of river pollution on the physical environment. (1 x 2) (2)

2.5.3 Quote a sentence from the extract to indicate rivers that cannot cope with the pressure of pollution. (1 x 1) (1)

2.5.4 State the importance of clean rivers on aquatic life. (1 x 2) (2)

2.5.5 In a paragraph of approximately EIGHT lines suggest measures that rural and urban authorities and communities can implement to reduce the pollution of rivers. (4 x 2) (8)

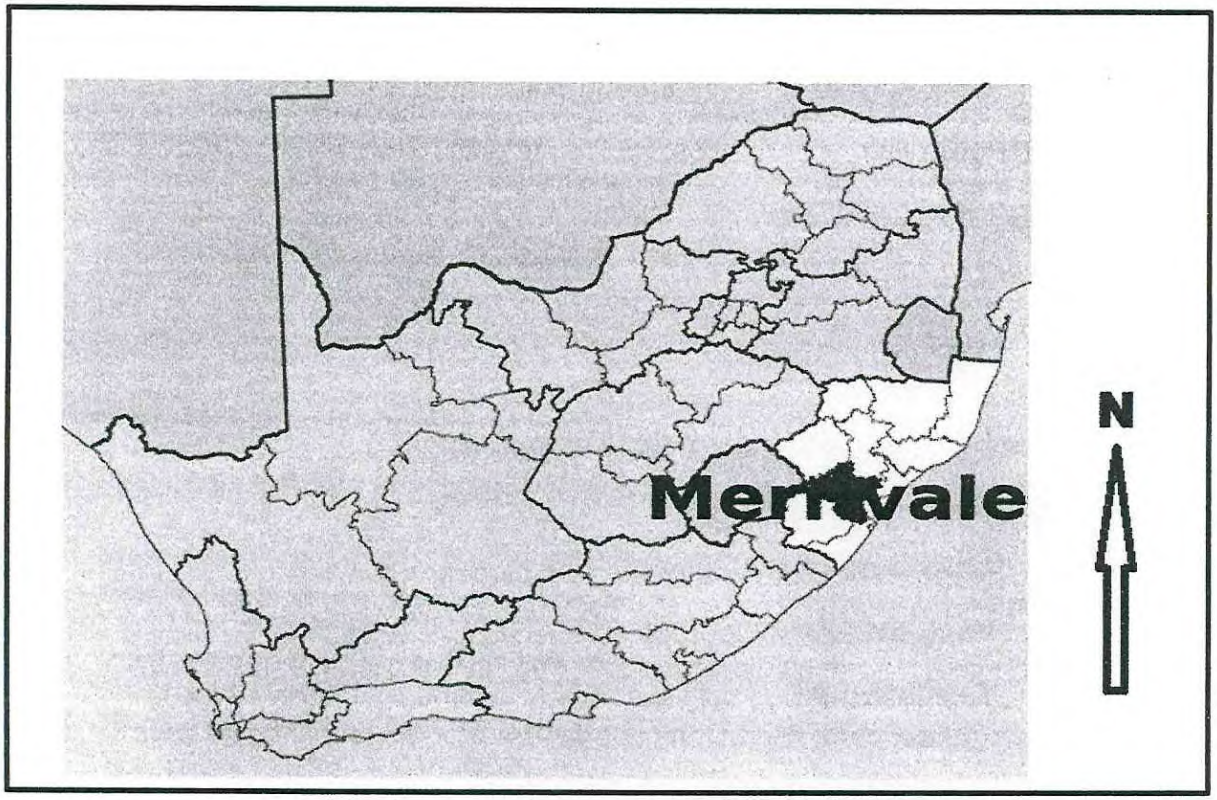
**[60]**

**TOTAL SECTION A: 120**

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## SECTION B

### GENERAL INFORMATION ON MERRIVALE




Coordinates: 29°31'S, 30°14'E

Merrivale is a small town in the province of Kwazulu-Natal in South Africa. It lies in the uMgungundlovu District municipality. It is located about 145 km north-west of Durban and 5 km south-east of Howick. The area has varied elevation, ranging from +/- 1018 m to 20308 m above sea level. This indicates a hilly to mountainous landscape, typical of Kwazulu-Natal Midlands. The climate of the area comprises of warm, wet summers and cool, dry winters. The temperatures range from +/- 5°C in winter, to 32°C in summer. The town is located near the Umgeni river system and close to Howick Dam. The land use includes residential areas, small-scale agriculture and tourism.

Adapted from chatgpt.com

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

| ENGLISH | AFRIKAANS |
|---|---|
| **Sewage works** | **Rioolwerke** |
| **Rifle range** | **Skietbaan** |
| **Nature reserve** | **Natuurreservaat** |

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## QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

### 3.1. MAP SKILLS AND CALCULATIONS

3.1.1 The slope observed in block E4 on the orthophoto map is (steep/gentle) (1 x 1) (1)

3.1.2 The feature labelled **H** on the topographical map is ...

A Power line

B Perennial River

C Other road

D Track (1 x 1) (1)

3.1.3 The orthophoto map of Merrivale is an example of ...

A Horizontal photograph

B Oblique aerial photograph

C Vertical aerial photograph

D Thematic map (1 x 1) (1)

Refer to the topographical map

3.1.4 Calculate the average gradient between the spot height 1067 in block **C2** and trig beacon 156 in block **D3**

**Formula: Gradient = Vertical interval (VI) / Horizontal Equivalent (HE)** (1 x 1) (4)

3.1.5 State the direction of recreation area **F** in block **D2** to spot height 1067 in block **C2** (1 x 1) (1)

3.1.6 If you are at Mashingeni in block **E3**, would you be able to see Howick Airfield in block **C3**? Explain your answer. (1 x 2) (2)

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## 3.2. MAP INTERPRETATION

Refer to block **B3** on the orthophoto map

3.2.1 At what time of the day was the orthophoto taken? (1 x 1) (1)

3.2.2 Explain your answer in QUESTION 3.2.1 (a) (1 x 2) (2)

Refer to the topographical map

3.2.3 Identify the type of winds that blow at **G** during the day. (1 x 1) (1)

3.2.4 Why do the winds in QUESTION 3.2.3 blow in that area? (1 x 2) (2)

Refer to blocks **E1** to **E4** on the topographical map

3.2.5 What do the streams found in these blocks suggest about the rainfall pattern of Merrivale? (1 x 1) (1)

3.2.6 Motivate your answer to QUESTION 3.2.5. (1 x 2) (2)

3.2.7 Explain why water infiltration rate will be low at block **E2** on topographical map. (1 x 2) (2)

3.2.8 The drainage pattern at **I** encircled in block **C3** and **D3** is dendritic. Describe the underlying rock structure of a dendritic drainage pattern. (1 x 1) (1)

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## 3.3. GEOGRAPHICAL INFORMATION SYSTEM (GIS)

3.3.1 Data layers on the topographical map are placed on top of each in a process called…

A Data manipulation

B Data layering

C Data standardisation

D Data sharing (1 x 1) (1)

3.3.2 Data that represents location of all geographical features is known as ... (1 x 1) (1)

3.3.3 The orthophoto map was captured through a process called remote sensing. Explain the benefits of remote sensing. (1 x 2) (2)

3.3.4 Discuss how data manipulation can be used to address the problems of floods in block **B4** and **C4** of the topographical map. (2 x 2) (4)

**TOTAL SECTION B: [30]**

**GRAND TOTAL: 150**

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