GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION
GRADE 12

2026

GEOGRAPHY

(PAPER 1)

GEOGRAPHY P1

C2781E

TIME: 3 hours

MARKS: 150

18 pages

X05

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 open 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

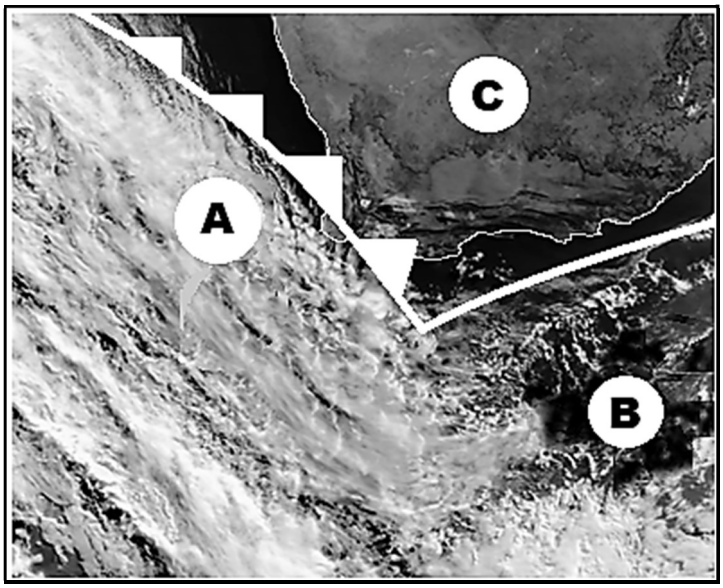
14. A 1 : 50 000 topographic map 2829 AC HARRISMITH and a 1 : 10 000 orthophoto map 2829 AC 8 BARNS are provided.
15. The area demarcated in RED/BLACK on the topographical map represents the area covered by the orthophoto map.
16. Marks will be allocated for steps in calculations.
17. You must hand in the topographic and the orthophoto maps to the invigilator at the end of this examination session.

SECTION A: CLIMATE, 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 (A – D) next to the question numbers (1.1.1 to 1.1.7) in the ANSWER BOOK, e.g. 1.1.8 D.

Refer to the satellite image below showing a mid-latitude cyclone.



[Adapted from Facebook – Storm Report SA]

1.1.1 What is the general direction in which this mid-latitude cyclone moves?

A West to east
B North to south
C East to west
D South to north

1.1.2 Why is there more cloud cover at area **A** than at area **B**?

A Rapid upliftment of air at the cold front
B Increased subsidence at the cold front
C Decreased condensation at the cold front
D Increased condensation at the warm front

1.1.3 Area **A** will most likely have … clouds.

A cumulus
B cirrus
C stratocumulus
D cumulonimbus

1.1.4 What will happen to the wind direction when the cold front passes the Southwestern Cape?

A It will change from south-easterly to north-easterly.
B It will change from south-westerly to north-westerly.
C It will change from north-westerly to south-westerly.
D It will change from north-easterly to south-easterly.

1.1.5 **C** is located in the …

A cold sector.
B occluded sector.
C warm sector.
D frontal sector.

1.1.6 Why will the temperature at **C** decrease as the cold front passes?

A The humidity at **C** decreases.
B The cold air behind the cold front will arrive.
C Warm air at **C** will rise.
D Warm air at the warm front moves ahead of **C**.

1.1.7 The occluded front in a mid-latitude cyclone is formed when …

A cold air sinks and separates from warm air.
B the cold front overtakes the warm front.
C warm air pushes ahead of the cold air.
D two cold fronts meet and merge.

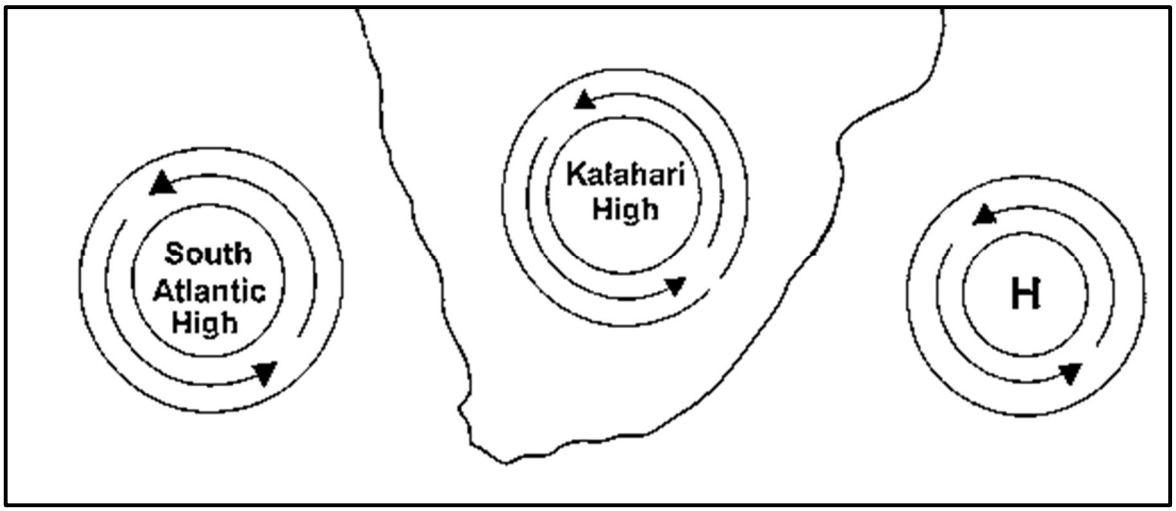
(7 x 1) (7)

1.2 Match the terms/concepts in COLUMN B with the statements/descriptions in COLUMN A. Write only **Y** or **Z** next to the question numbers (1.2.1 to 1.2.8) in the ANSWER BOOK e.g. 1.2.9 Y.

	COLUMN A		COLUMN B
1.2.1	Tropical cyclones may form when sea surface temperatures are above …	Y Z	23,5 °C 26,5 °C
1.2.2	In the Southern Hemisphere tropical cyclones rotate …	Y Z	clockwise anticlockwise
1.2.3	The centre of a tropical cyclone is called the …	Y Z	eye wall cloud
1.2.4	Tropical cyclones gain latent energy from the … process.	Y Z	condensation evaporation
1.2.5	A tropical cyclone loses strength when it moves …	Y Z	over land over warm water
1.2.6	The strongest winds in a tropical cyclone will occur in the …	Y Z	eye wall outer bands
1.2.7	Tropical cyclones cause damage through high winds, heavy rain, and …	Y Z	storm surges low temperatures
1.2.8	Tropical cyclones move from … in the Southern Hemisphere.	Y Z	west to east east to west

(8 x 1) (8)

1.3 Refer to the sketch below which shows high pressure systems.



[Adapted from *https://www.theanswer.co.za/wp-content/uploads*]

1.3.1 Name the high-pressure system located to the east of South Africa. (1 x 1) (1)

1.3.2 Discuss how the high-pressure system mentioned in QUESTION 1.3.1 contributes to summer rainfall in the eastern parts of South Africa. (2 x 2) (4)

1.3.3 When the Kalahari high-pressure system dominates the interior of South Africa during winter, residents of Bloemfontein describe the typical weather as days starting with cold mornings that warm up in the afternoon with dry air.

(a) Explain why the temperature increases from morning to afternoon. (1 x 2) (2)

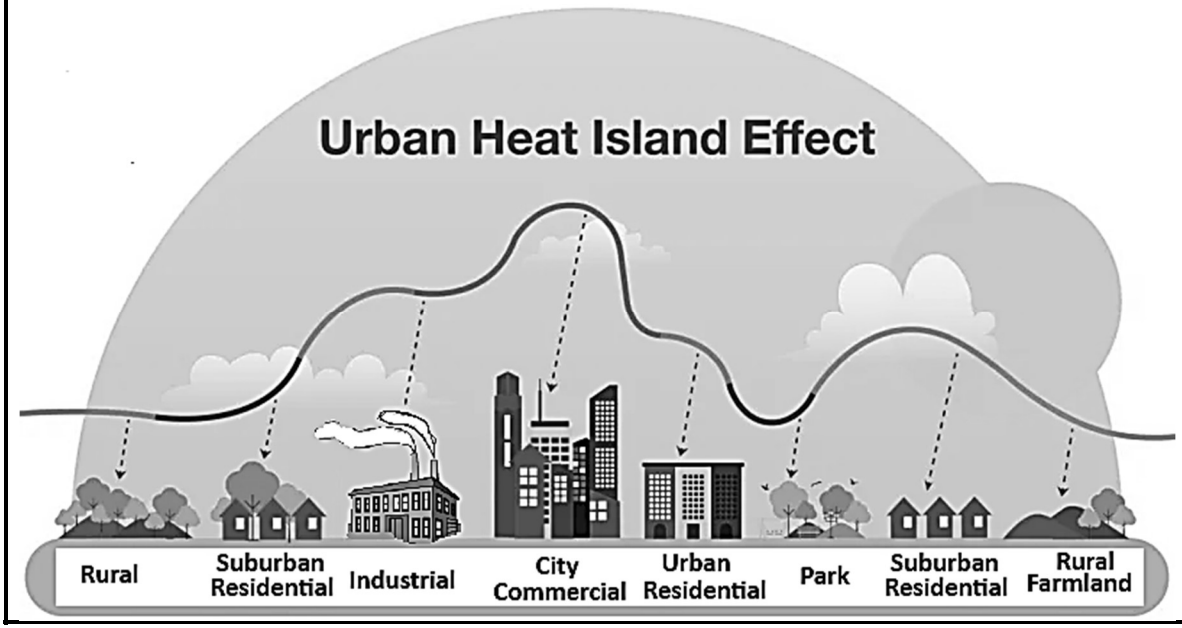
(b) Why are the weather conditions in Bloemfontein described as 'dry'? (2 x 2) (4)

1.3.4 Discuss the negative environmental impact that may be caused by the dominant Kalahari High-Pressure system in winter. (2 x 2) (4)

1.4 Refer to the infographic below on the urban heat island effect.

MOST CITIES RECEIVE MORE RAINFALL THAN THE SURROUNDING RURAL AREAS

The urban heat island effect is relatively well-known. What fewer people know is that the urban heat island has a counterpart with important consequences: urban development increases the amount of rainfall in an urban area as compared to the surrounding rural area. This could have wide-ranging implications, the most serious of which is flash flooding in densely built urban areas which damages infrastructure.



[Source: *https://www.google.com/search?q=urban+heat+island+effect+diagram*]

1.4.1 Define the term *urban heat island*. (1 x 2) (2)

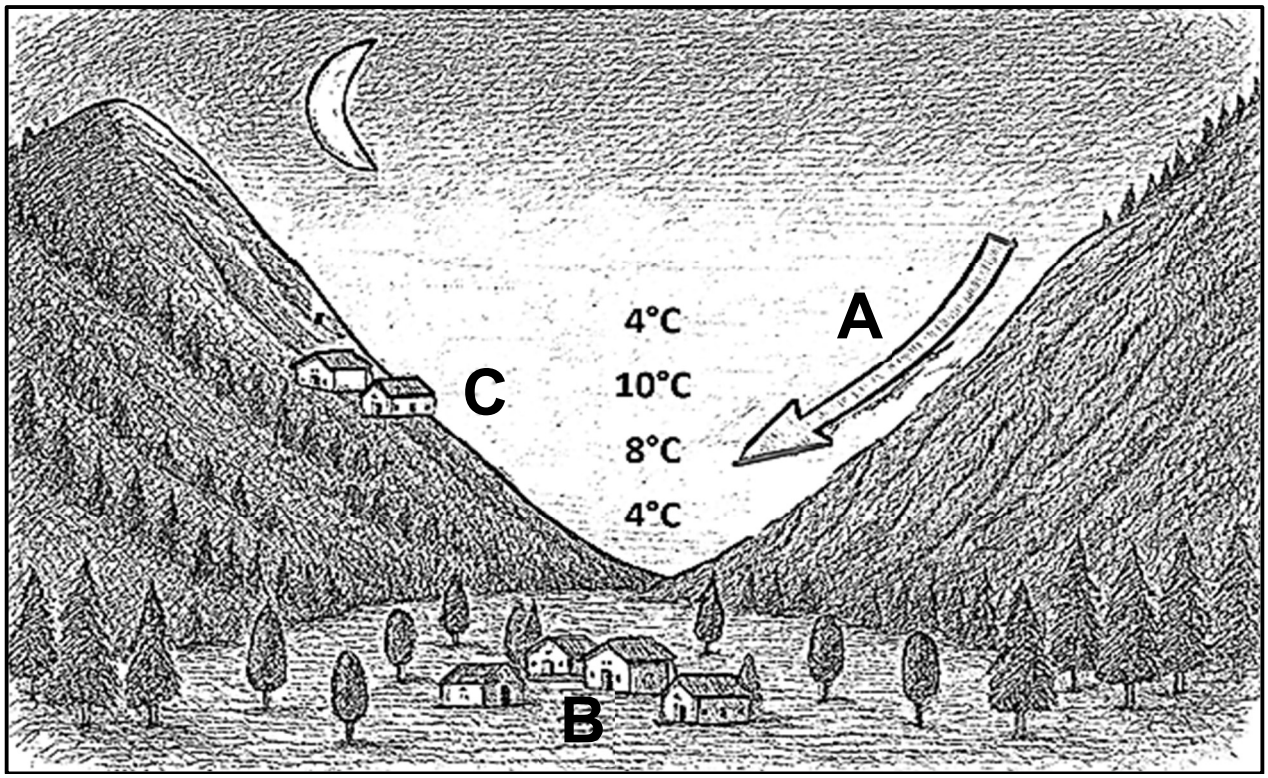
1.4.2 Describe ONE human activity evident in the sketch that contributes to the urban heat island effect. (1 x 2) (2)

1.4.3 Identify the natural hazard caused by increased rainfall, as mentioned in the article. (1 x 1) (1)

1.4.4 Explain why there is a rainfall difference between rural and urban areas. (1 x 2) (2)

1.4.5 In a paragraph of approximately EIGHT lines, discuss natural materials and methods that can be used to reduce the urban heat island effect. (4 x 2) (8)

1.5 Refer to the sketch of atmospheric conditions in a valley at night.



[Adapted from *http://www.heidorn.info/keith/weather/elements/inversion.htm*]

1.5.1 Identify the wind at **A**. (1 x 1) (1)

1.5.2 Define the term *temperature inversion*. (1 x 2) (2)

1.5.3 Explain how temperature inversion occurs in a valley. (2 x 2) (4)

1.5.4 Explain how the wind mentioned in QUESTION 1.5.1 will negatively impact a farming community located on the valley floor at **B**. (2 x 2) (4)

1.5.5 Discuss how temperature inversion in valleys can have a negative effect on the health of people living on the slope of the valley at **C.** (2 x 2) (4)

[60]

QUESTION 2: GEOMORPHOLOGY

2.1 Various options are provided as possible answers to the following questions. Choose the answers and write only the letter (A – D) next to the question numbers (2.1.1 to 2.1.7) in your ANSWER BOOK. e.g. 2.1.8 D.

Refer to the following drainage patterns to answer QUESTIONS 2.1.1 to 2.1.3.

2.1.1 This drainage pattern develops on:

A Heterogeneous rock
B Uniform rock
C Faulted and jointed rock
D Rock dome



[Examiner's own sketch]

2.1.2 The following drainage pattern is:

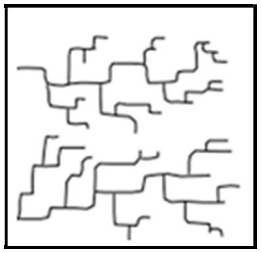
A Centripetal
B Annular
C Centrifugal
D Deranged



[Examiner's own sketch]

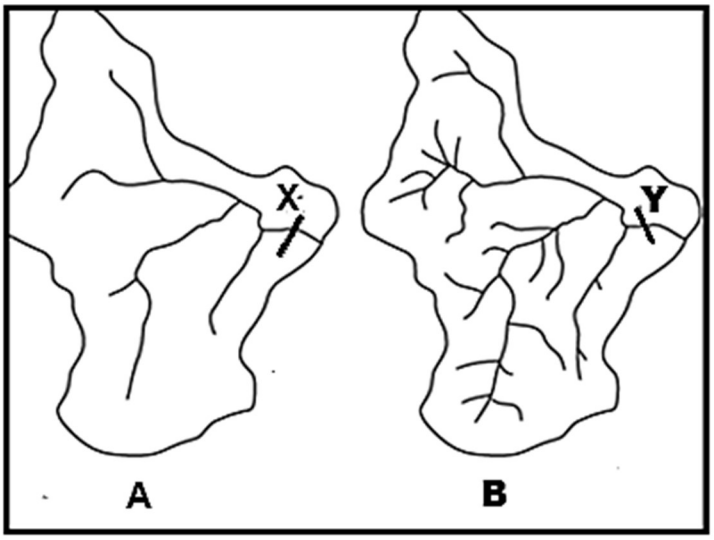
2.1.3 This drainage pattern is:

A Trellis
B Dendritic
C Parallel
D Rectangular



[Examiner's own sketch]

Refer to the sketch below to answer QUESTIONS 2.1.4 to 2.1.7.



[Examiner's own sketch]

2.1.4 Drainage basin **A** has a … drainage density where less … takes place.

i low
ii high
iii runoff
iv infiltration

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

2.1.5 The stream order at **X** in drainage basin **A** is:

A 1
B 2
C 3
D 4

2.1.6 The stream order at **Y** in drainage basin **B** will be … than at **X** in drainage basin **A** because of … surface runoff.

i lower
ii higher
iii more
iv less

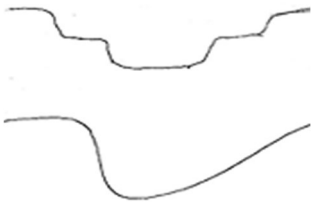
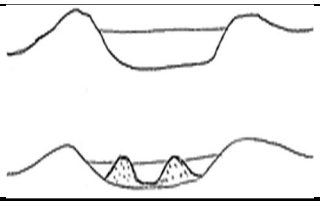
A i and iii
B i and iv
C ii and iii
D ii and iv

2.1.7 Drainage basin **B** will be located in an area drained by … rivers and … vegetation cover.

A permanent; sparse
B periodic; dense
C permanent; dense
D periodic; sparse

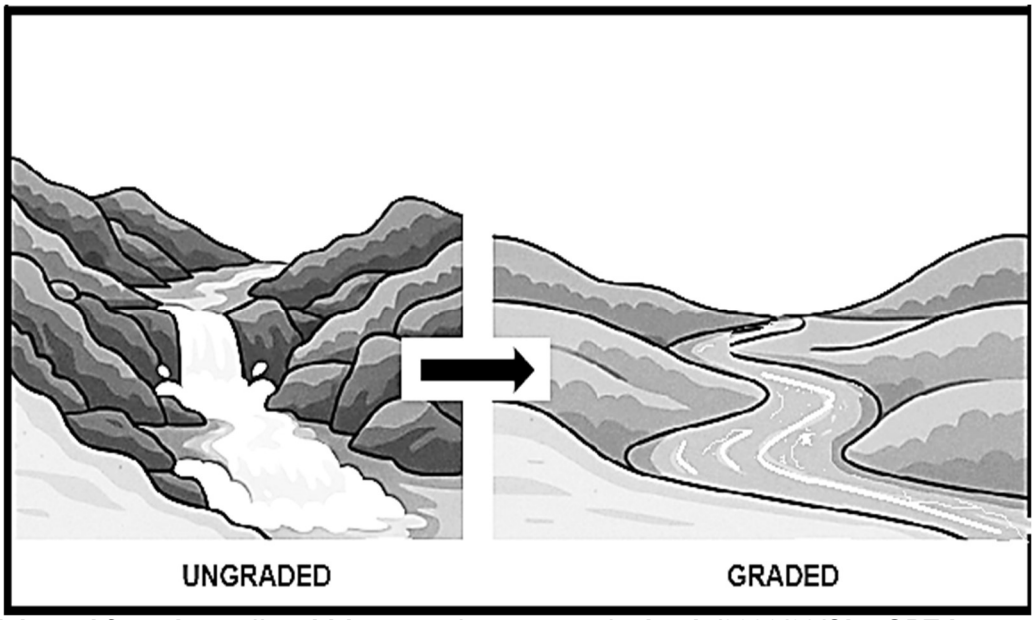
(7 x 1) (7)

2.2 Match the terms/concepts in COLUMN B with the statements/descriptions in COLUMN A. Write only **Y** or **Z** next to the question numbers (2.2.1 to 2.2.8) in the ANSWER BOOK e.g. 2.2.9 Y.

	COLUMN A		COLUMN B
2.2.1	A V-shaped valley develops through …	Y Z	vertical erosion headward erosion
2.2.2	The landform that will most likely develop when a river crosses an area with inclined heterogeneous (hard and soft) rock strata	Y Z	rapid waterfall
2.2.3	When a stream cuts through a watershed, a steep-sided valley called a/an … will sometimes develop.	Y Z	escarpment gorge
2.2.4	… drainage occurs when a river is older than the landform across which it cuts.	Y Z	Antecedent Superimposed
2.2.5	The volume and velocity increases after river capture in the … stream.	Y Z	captured captor
2.2.6	A crescent-shaped lake that is found along a river in the lower course	Y Z	oxbow lake plunge-pool lakes
2.2.7	This cross-section shows a valley before rejuvenation took place.	Y Z	
2.2.8	A cross-section of a braided river channel	Y Z	

(8 x 1) (8)

2.3 Refer to the diagram below and answer the questions that follow.



[Adapted from *https://worldrivers.net/wp-content/uploads/2020/08/ChatGPT-Image-Apr-15-2025-08_55_19-PM-1024x683.jpg*]

2.3.1 What is *river grading*? (1 x 2) (2)

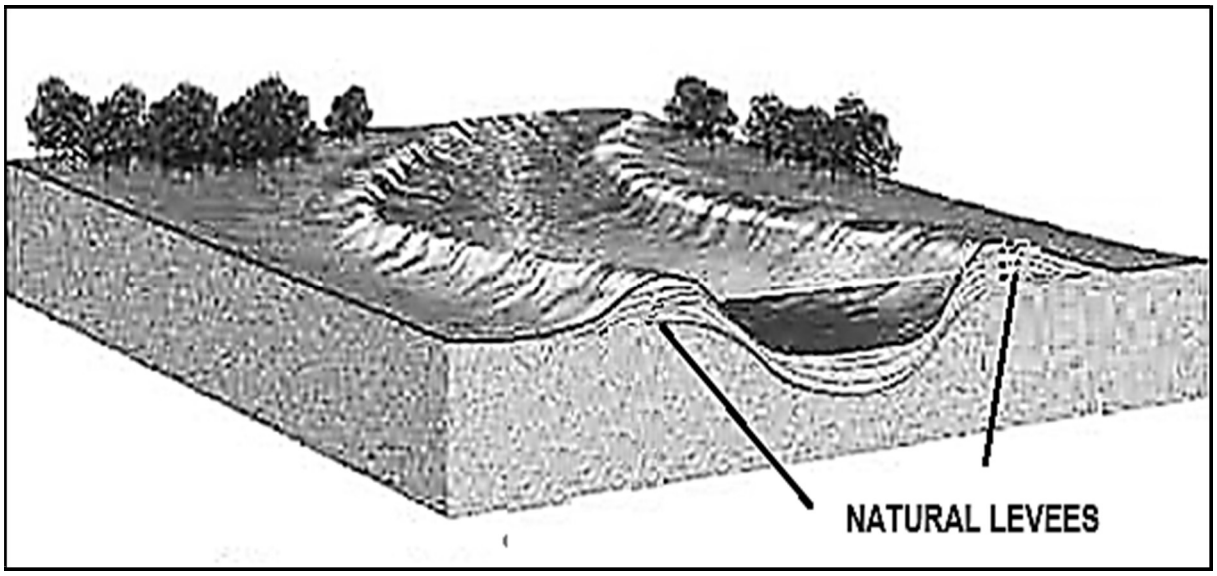
2.3.2 Describe TWO characteristics of an ungraded river. (2 x 1) (2)

2.3.3 Name the fluvial landforms visible in the diagram associated with the ungraded river profile. (2 x 1) (2)

2.3.4 Draw a labelled longitudinal profile of a graded river. (3 x 1) (3)

2.3.5 Explain how a river achieves and maintains a graded longitudinal profile. (3 x 2) (6)

2.4 Study the picture below on natural levees and answer the questions that follow.



[Source: *https://esomake.co.ke/images/secondary/geography/natural-levees-076.jpg*]

2.4.1 What are natural levees? (1 x 2) (2)

2.4.2 In which course of the river are natural levees found? (1 x 1) (1)

2.4.3 Which fluvial process results in the formation of natural levees? (1 x 2) (2)

2.4.4 Describe the size and texture of materials which form natural levees. (2 x 2) (4)

2.4.5 Discuss the physical impact that the development of natural levees has on the river channel and floodplain. (3 x 2) (6)

2.5 Refer to the extract below on catchment and river management and answer the questions that follow.

BLOUBANKSPRUIT: AN ECOLOGICAL DISASTER

Sewage spilling into streams and rivers from dysfunctional pump houses in Krugersdorp is causing serious problems for residents and businesses. A tour along the Bloubankspruit, from Munsieville to Muldersdrift on January 18 revealed a full-scale crisis in the making.

A pump station in Munsieville, looked after by a lone security guard, has not been in operation for months. The controls are now used as shelves for boxes, and even a pair of old boots. Just behind the pump houses in the veld, the stream of sewage meanders its way to the Bloubankspruit which flows from Krugersdorp, through Coronation Park, the Krugersdorp CBD, through Munsieville, and past the all-but-defunct Percy Stewart Wastewater Treatment Plant, from there making its way through Oaktree and to Muldersdrift.

The banks of this horrid stream are, in places, between six and eight metres high, and if the stench is not enough to convince you that this is no ordinary tranquil stream, the unnatural colour of the "water" certainly will. There are no signs of life to be seen anywhere around the stream. None of the birdlife that is normally associated with a place like this can be observed, just the smell, the eerie coloured water, and the stench.

The sewage situation along the Bloubankspruit is more than just an inconvenience for businesses along the flow of the spruit. It is an impending disaster if nothing is done to stop it. In addition to the many people who make their living from businesses along the spruit, the ecological damage to the area is significant.

[Source: *https://www.citizen.co.za/krugersdorp-news/news-headlines/local-news/2024/01/26/sewage-spill-a-crisis-in-the-making/*]

2.5.1 What is the main source of pollution of the Bloubankspruit? (1 x 1) (1)

2.5.2 Quote TWO phrases from the extract that prove that the pollution of the Bloubankspruit is an ecological disaster. (2 x 1) (2)

2.5.3 Account for the ecological disaster in the Bloubankspruit. (2 x 2) (4)

2.5.4 In a paragraph of approximately EIGHT lines, suggest measures that the local municipality and the local community can implement to avert this ecological disaster in the Bloubankspruit. (4 x 2) (8)

[60]

TOTAL SECTION A: 120

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON HARRISMITH



Coordinates: 28°17'0″S ; 29°08'0″E

Harrismith is a town in the Free State province of South Africa, well-known as a major crossroads for national trade routes (situated on the N3 highway between Johannesburg and Durban) and serves as a gateway to the Drakensberg mountains. The town is known for its scenic beauty, rich history, and outdoor activities. The Wilge River is a tributary of the Vaal River in central South Africa. This river has its source approximately 50 km northeast of Harrismith.

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

ENGLISH	AFRIKAANS
River	Rivier
Island	Eiland
Landing Strip	Landingstrook
Digging	Uitgrawing
Mainstream	Hoofstroom
Canal	Kanaal

3.1 MAP SKILLS AND CALCULATIONS

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

Refer to the topographic map and the orthophoto map.

3.1.1 In which province is Harrismith located?

A Gauteng
B Free State
C Eastern Cape
D Western Cape (1 x 1) (1)

3.1.2 The contour interval on the orthophoto map is:

A 5 m
B 10 m
C 15 m
D 20 m (1 x 1) (1)

Refer to the topographic map.

3.1.3 Calculate the distance between trigonometrical station **299** in block **C2** to spot height **1983** in block **B5** on the topographic map. (2 x 1) (2)

Formula: **Distance = Map Distance x Scale**

3.1.4 (a) Calculate the present magnetic declination (2026) on the topographic map.

Use the following information:

Annual change = 16'W. (4 x 1) (4)

(b) Calculate the present magnetic bearing (2026) from spot height **1672** in block **D4** to spot height **1668** in block **E4** on the topographic map.

Use the following information:

True bearing = 218° (1 x 1) (1)

(c) Discuss the importance of calculating the present magnetic bearing to aviation (flying). (1 x 1) (1)

3.2 MAP INTERPRETATION

3.2.1 Refer to area **F** and **G** on the topographic map.

(a) Which area (**F** or **G**) will have lower average temperatures? (1 x 1) (1)

(b) Provide evidence from the topographic map for your answer to QUESTION 3.2.1 (a). (1 x 2) (2)

3.2.2 Refer to both the topographic map and the orthophoto map.

(a) Identify river **6** found in block **B2** on the orthophoto map. (1 x 1) (1)

(b) In which general direction does the river identified in QUESTION 3.2.2(a) flow? (1 x 1) (1)

(c) Provide evidence from the topographic map to justify your answer to QUESTION 3.2.2(b). (1 x 1) (1)

3.2.3 (a) Identify the fluvial feature **12** in block **D4** on the orthophoto map. (1 x 1) (1)

(b) Identify the fluvial course of the river where feature **12,** the answer to QUESTION 3.2.3(a), is located. (1 x 1) (1)

(c) Draw a labelled, cross-section through line **8** to **9** in blocks **C2** and **C3** on the orthophoto map indicating the main fluvial processes and slopes. (4 x 1) (4)

3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

3.3.1 Define the concept of *data layering*. (1 x 2) (2)

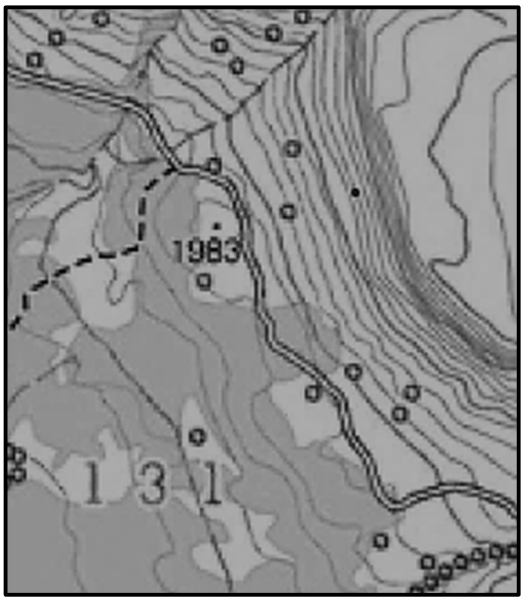
3.3.2 (Data manipulation/Data standardisation) involves the process of converting data to a common format that can be easily read and understood globally.

Choose the correct answer from the brackets. (1 x 1) (1)

Use the following extract from block **B5** on the topographic map to answer QUESTIONS 3.3.3 and 3.3.4.

3.3.3 Refer to the vector data in the extract and identify ONE example of natural line data and ONE example of a man-made point data.

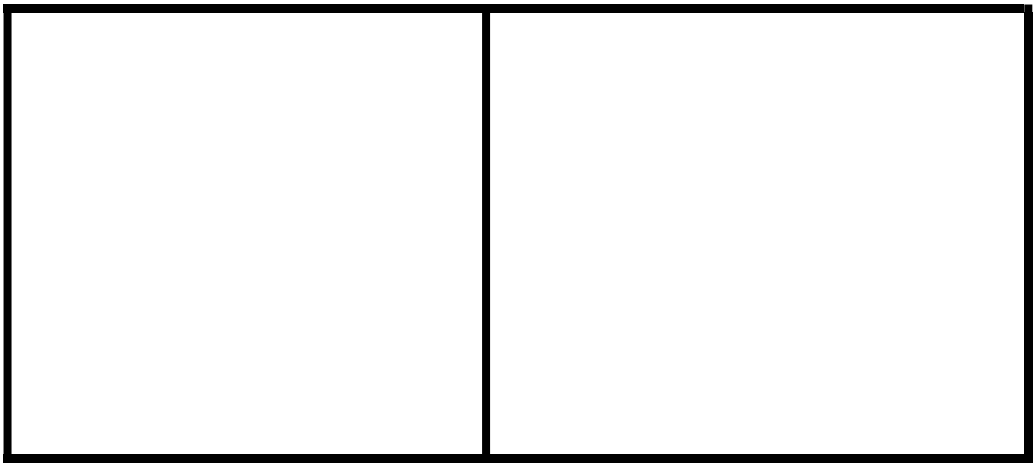
(2 x 1) (2)



3.3.4 Draw TWO adjacent blocks, as shown below in your ANSWER BOOK. Use the concept of paper GIS and draw the following in the two adjacent blocks:

(a) Infrastructure data layer

(b) Drainage data layer (2 x 1) (2)



(c) Why are data standardisation and data manipulation important when performing data layering? (1 x 1) (1)

[30]

TOTAL SECTION B: 30

TOTAL: 150