



education

**MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA**

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

GEOGRAPHY P1

JUNE 2026

MARKS: 150

TIME: 3 HOURS

This question paper consists of 15 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS.
SECTION A
QUESTION 1: CLIMATE AND WEATHER (60 MARKS)
QUESTION 2: GEOMORPHOLOGY (60 MARKS)
SECTION B
QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES (30 MARKS)
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. Stanmorephysics.com
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.

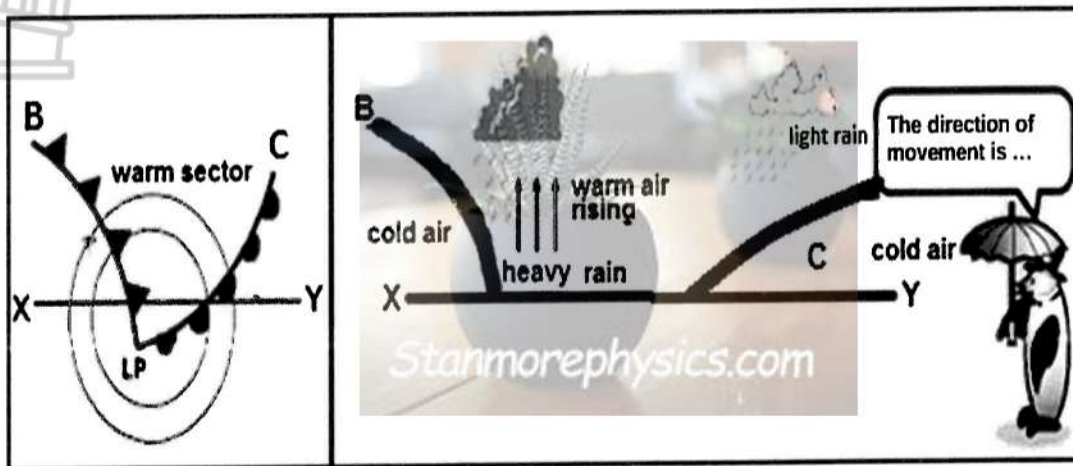
SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

14. A 1 : 50 000 topographic map 2531 BC MALELANE and a 1 : 10 000 orthophoto map 2531 BC 16 RIVERSIDE 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 orthophoto map to the invigilator at the end of the examination.

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

1.1 Refer to the diagram based on a mid-latitude cyclone. 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), e.g. 1.1.9 D.



[Source: ftp://ftp.hhs.co.za/Subjects]

1.1.1 Mid-latitude cyclones develop at the ... front

- A moisture
- B warm
- C polar
- D cold

1.1.2 The above mid-latitude cyclone is situated in the ... hemisphere.

- A northern
- B eastern
- C southern
- D western

1.1.3 The direction of movement of this mid-latitude cyclone is eastwards, steered by the...

- A Subtropical easterlies.
- B Tropical westerlies.
- C Subtropical westerlies.
- D Polar westerlies.

1.1.4 Front ... is associated with strong winds and heavy rainfall.

- A X
- B Y
- C C
- D B

1.1.5 The movement of the mid-latitude cyclone in summer in the Southern Hemisphere is due to the position of the ITCZ located ... of the equator.

- A north
- B east
- C west
- D south

1.1.6 The steeper gradient at **B** causes ...

- i) warm air undercutting cold air.
- ii) strong updraughts of warm air.
- iii) cold air moving faster.
- iv) cold air undercutting warm air.

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

1.1.7 The wave deepens because of

- A equal velocity.
- B same temperatures.
- C less friction.
- D temperature differences.

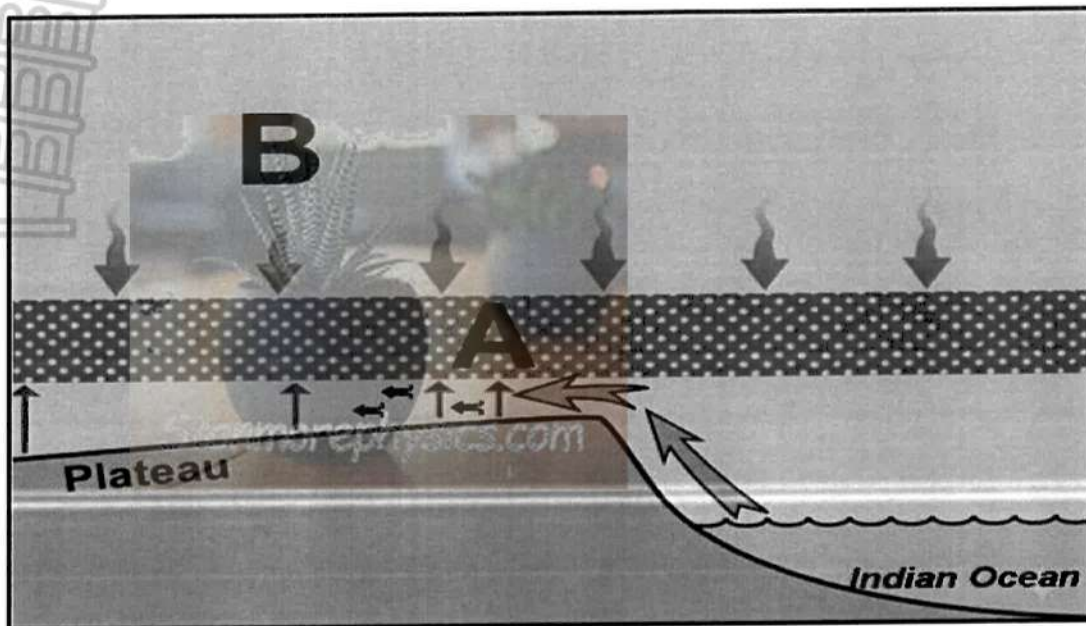
1.1.8 ... is associated with a mid-latitude cyclone.

- A Winter rainfall in the interior
- B Winter rainfall in the South Western Cape
- C Strong gale force winds in the east coast
- D Summer rainfall in the West coast



(8 x 1) (8)

- 1.2 Study the diagram based on anticyclones and answer the questions that follow. Choose the correct term or concept in brackets. Write only the correct answer e.g. 1.2.8 low pressure. Stanmorephysics.com



[Source: Adapted from Focus textbook Gr 12]

- 1.2.1 The season depicted in the diagram is (winter/summer).
- 1.2.2 The descending air at **B** is a characteristic of a (High pressure/Low pressure) system.
- 1.2.3 (Stable/unstable) weather conditions prevail over the interior.
- 1.2.4 The position of the inversion layer results in the water level of dams (increasing/decreasing).
- 1.2.5 The (coastal/thermal) low displaces the Kalahari High in summer.
- 1.2.6 The figure shows ascending (moist/dry) air from the Indian Ocean.
- 1.2.7 The area labelled **A** on the diagram is the (inversion layer/thermal belt).
(7 x 1) (7)

- 1.3 Study the extract below, about Hurricane Melissa and answer the following questions.

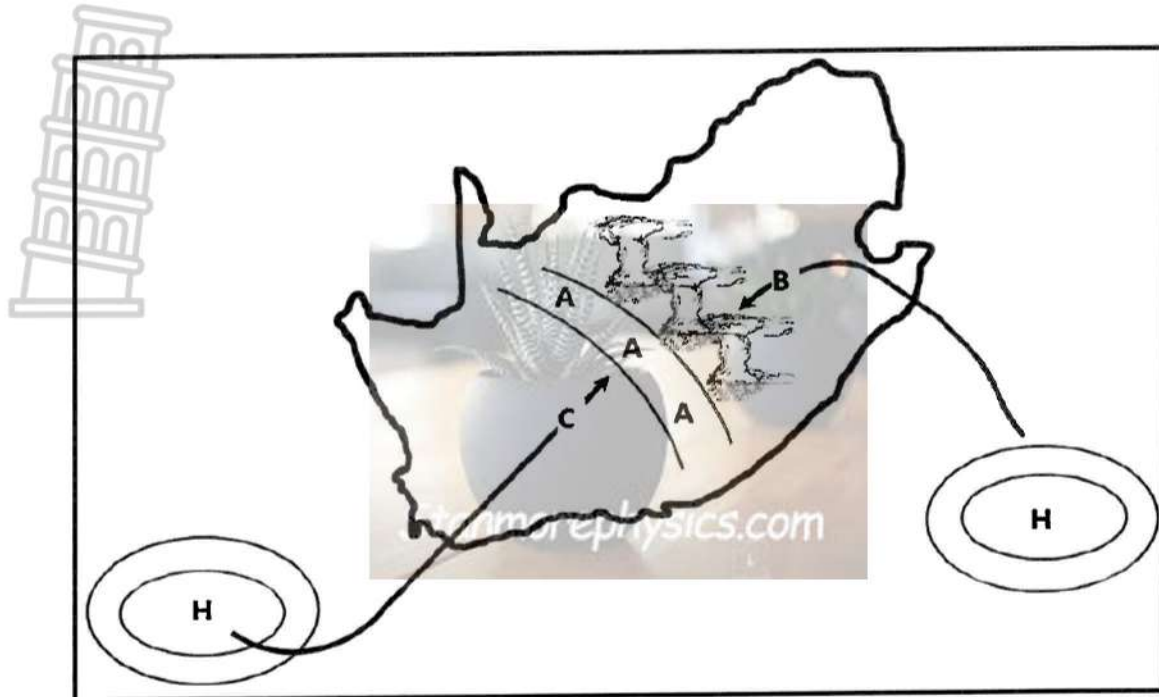
Hurricane Melissa was an extremely powerful, erratic, and devastating cyclone. This Category 5 hurricane of the 2025 Atlantic hurricane season, was also the strongest cyclone worldwide in 2025. The storm caused catastrophic damage upon landfall in Jamaica. It also generated the highest wind gust ever recorded by dropsonde data, with a wind gust of 406 km/h at an altitude of 200 m, exceeding the record set by Typhoon Megi in 2010. Climate scientists analysing Melissa concluded that human-driven climate change, which raises ocean temperatures, intensified the hurricane's destructive winds and rainfall.

[Source: Adapted from en.wikipedia.org]

- 1.3.1 In which hemisphere did this tropical cyclone occur? (1 x 1) (1)
- 1.3.2 Give a reason for your answer to QUESTION 1.3.1. (1 x 1) (1)
- 1.3.3 According to the extract what evidence suggests that Jamaica is usually affected by tropical cyclones. (1 x 1) (1)
- 1.3.4 Account for Melissa being classified as a Category 5 hurricane. (1 x 2) (2)
- 1.3.5 Explain why Cyclone Melissa is expected to weaken once it hits Jamaica? Stanmorephysics.com (2 x 2) (4)
- 1.3.6 According to the extract the negative impact of Tropical Cyclone Melissa was devastating. Suggest THREE strategies that could be put in place to reduce this impact. (3 x 2) (6)



1.4 Study the diagram showing line thunderstorms.



[Source: <https://www.studocu.com/en-za/document/university-of-cape-town/geography-sp-fet/line-thunderstorms-marking-guideline>]

- 1.4.1 Define *line thunderstorms*. (1 x 2) (2)
- 1.4.2 Name wind **B** and **C** respectively. (2 x 1) (2)
- 1.4.3 Identify zone **A**. (1 x 1) (1)
- 1.4.4 Name and describe the cloud type associated with the development of line thunderstorms. (2 x 1) (2)
- 1.4.5 In a paragraph of approximately EIGHT lines outline the negative impacts of line thunderstorms. (4 x 2) (8)

- 1.5 Refer to the case study based on urban climate.



JOHANNESBURG SETS OUT TO REDUCE THE IMPACT OF HEAT ISLAND EFFECT.

The Heat Island effect is a phenomenon which metropolitan regions across the world experience. This is due to absorption and retention by buildings, pavement, and other man-made structures. This can lead to a range of severe consequences for human health and the environment, such as increased energy consumption for cooling buildings, exacerbate air pollution, smog formation and affect human health by intensifying heat related illnesses.

[Adapted from https://joburg.org.za/media_/Newsroom]

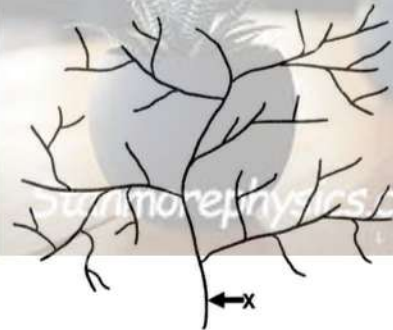
- 1.5.1 State how temperature changes as one moves towards Johannesburg. (1 x 1) (1)
- 1.5.2 According to the extract how do buildings contribute to urban heat islands? (1 x 2) (2)
- 1.5.3 Why is the chance of thunderstorms greater in Johannesburg than in the surrounding rural area? (2 x 2) (4)
- 1.5.4 Explain why rural areas are cooler than the nearby urban areas. (2 x 2) (2)
- 1.5.5 Discuss strategies that the city of Johannesburg can implement to reduce the heat caused by buildings and pavements. (3 x 2) (6)

[60]

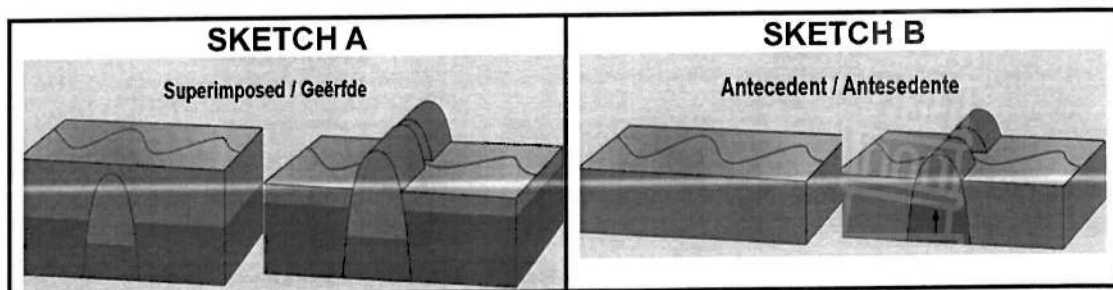


QUESTION 2: GEOMORPHOLOGY

2.1 Match the statement in COLUMN A with the term/concept in COLUMN B, write only the question number and the correct letter e.g. 2.1.9 Y

COLUMN A		COLUMN B	
2.1.1	Top level of groundwater.	Y	Water table
		Z	Watershed
2.1.2	Water flowing below the earth's surface.	Y	Run off
		Z	Baseflow
2.1.3	A perennial river that originates in a water-rich area and flows through an arid landscape.	Y	Exotic
		Z	Episodic
2.1.4	Area drained by a river and its tributaries.	Y	River system
		Z	Drainage basin
2.1.5	The stream order at X.	Y	4 th order
		Z	5 th order
			
2.1.6	Land that separates streams of the same drainage basin.	Y	Interfluves
		Z	Watershed
2.1.7	Area that supplies water to a river.	Y	Catchment area
		Z	Drainage system
2.1.8	A place where two rivers meet.	Y	Tributary
	Stanmorephysics.com	Z	Confluence (8 x 1) (8)

2.2 Refer to the sketches about superimposed and antecedent rivers. Choose the pattern that matches the statement and write only the correct letter e.g. 2.2.8 A



[Source: examiner's own sketch]

- 2.2.1 The river maintains its course even after the upliftment of the landscape.
- 2.2.2 The river is not related to the landscape through which it flows.
- 2.2.3 The river is younger than the landscape through which it flows.

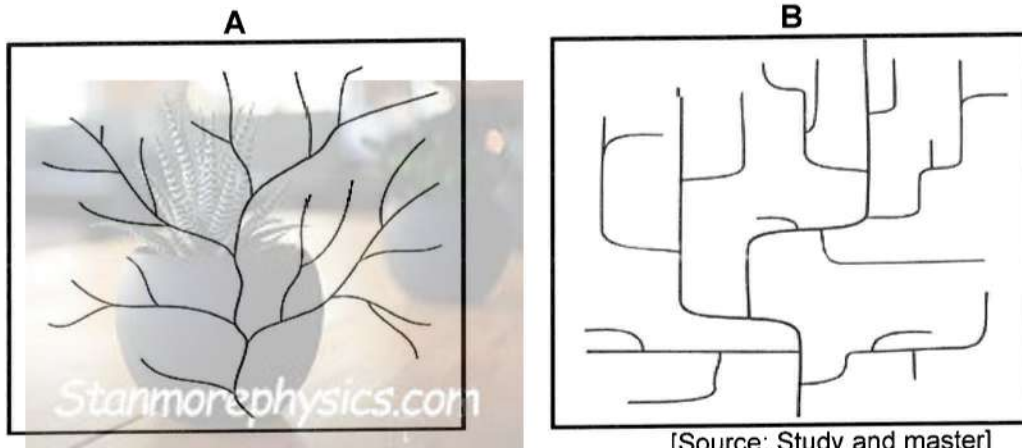
2.2.4 The original rock formation is removed by erosion.

2.2.5 The river pattern was formed before folding or faulting.

2.2.6 The river is older than the landscape through which it flows.

2.2.7 The river maintains its pattern over a different rock structure. (7 x 1) (7)

2.3 Refer to the sketch below based on drainage patterns and answer the questions.



[Source: Study and master]

2.3.1 Identify the drainage patterns marked **A** and **B** respectively. (2 x 1) (2)

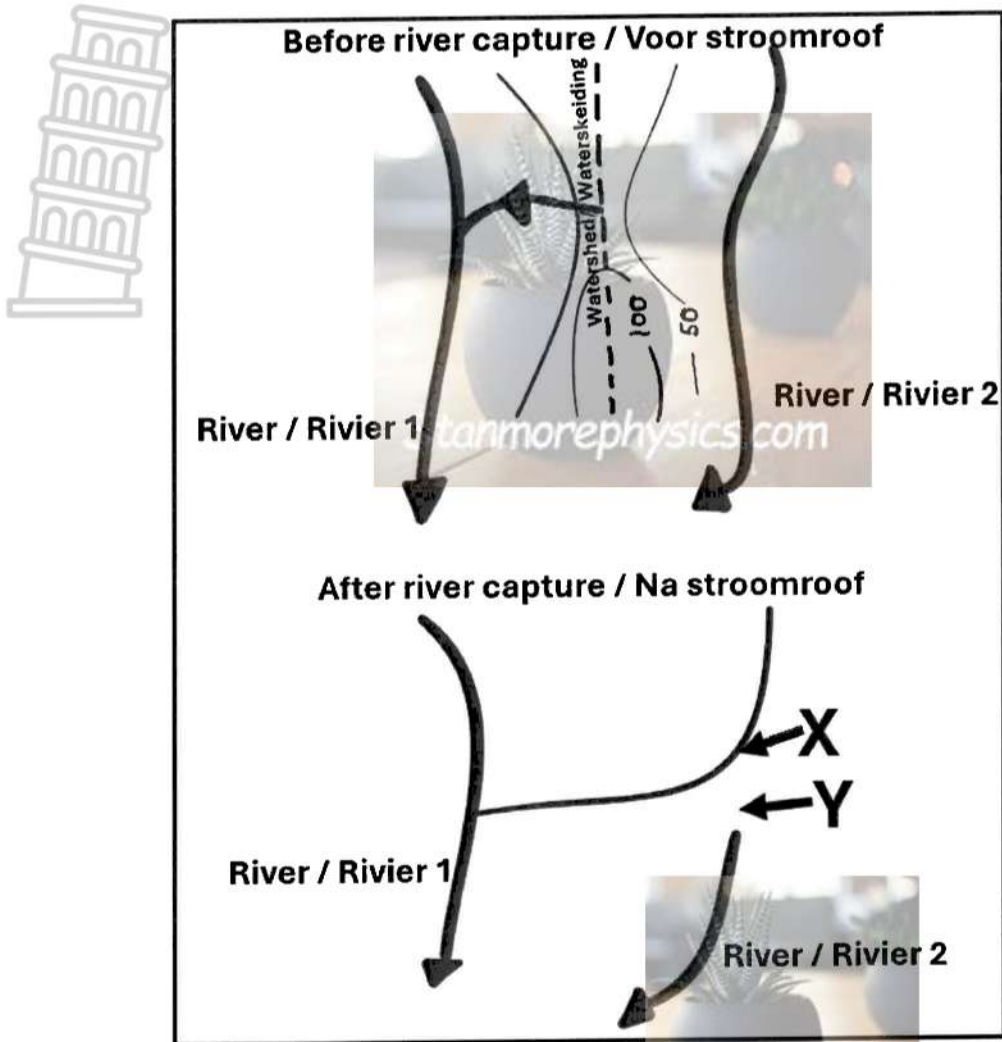
2.3.2 State the underlying type of rock on which drainage pattern **B** develops. (1 x 1) (1)

2.3.3 Describe the characteristics of drainage patterns **A** and **B** in relation to the tributaries joining the main stream. (2 x 2) (4)

2.3.4 Explain the relationship between drainage density and stream order. (1 x 2) (2)

2.3.5 Outline possible factors that resulted in the high drainage density on diagram **A**. (3 x 2) (6)

2.4 Study the diagram showing river capture.



[Source: Examiners own]

- 2.4.1 Define *river capture*. (1 x 2) (2)
- 2.4.2 State ONE condition needed for river capture to take place. (1 x 2) (2)
- 2.4.3 Identify features marked X and Y respectively. (2 x 1) (2)
- 2.4.4 What is the process by which river 1 lengthens its channel by cutting through the watershed known as? (1 x 2) (2)
- 2.4.5 Will river 1 or 2 experience rejuvenation after river capture? (1 x 1) (1)
- 2.4.6 Give a reason for your answer to QUESTION 2.4.5? (1 x 2) (2)
- 2.4.7 Describe TWO physical changes that river 2 will experience after river capture. (2 x 2) (4)

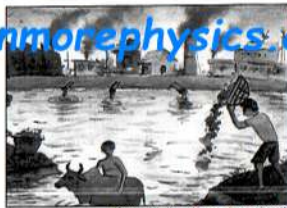
2.5 Study the cartoon and answer the questions that follow.



Downloaded from Stanmorephysics.com

- 2.5.1 According to the cartoon what is the main reason for river pollution. (1 x 1) (1)
- 2.5.2 State a possible health issue that might affect humans as a result of river pollution. (1 x 2) (2)
- 2.5.3 Explain the negative impact of river pollution on the health of rivers. (2 x 2) (4)
- 2.5.4 Discuss the economic importance of river management. (2 x 2) (4)
- 2.5.5 Explain how buffering of a river could be a sustainable strategy for river management. (2 x 2) (4) [60]

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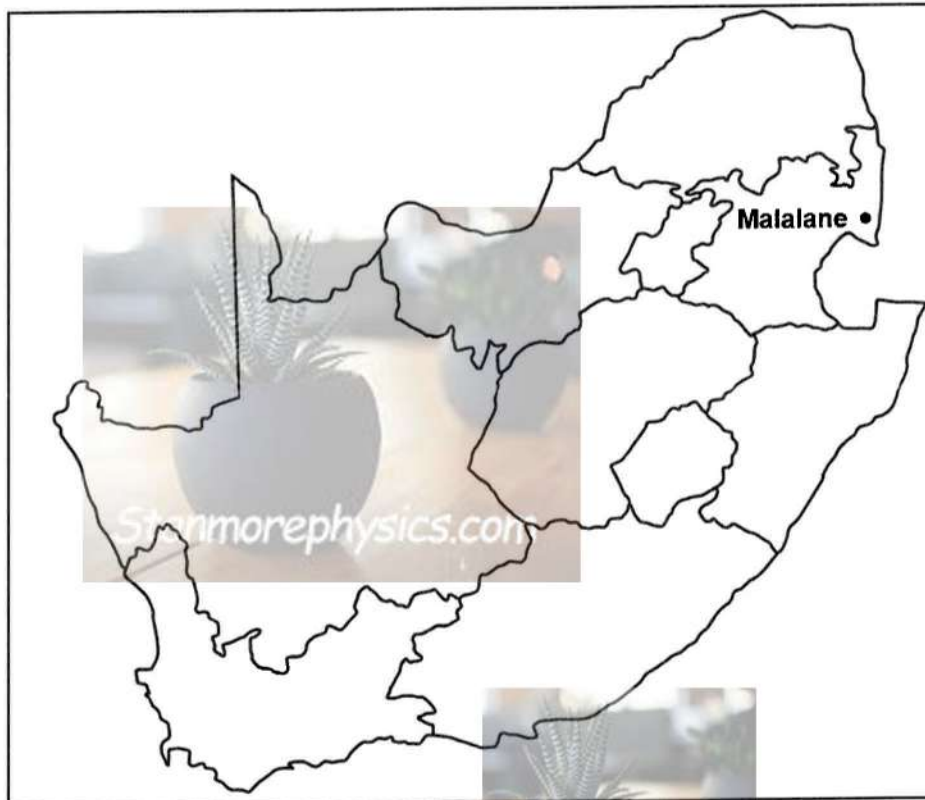
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SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON MALELANE



COORDINATES: **25°29'S 31°31'E**

Malelane, a farming town in Mpumalanga, South Africa situated on the N4 national highway. The farms in the region produce sugarcane, subtropical fruit and winter vegetables. Malelane features a warm, subtropical climate with hot, wet summers and mild, dry winters, typical of the Mpumalanga Lowveld. Average annual temperatures are around 27°C with summer highs often exceeding 30°C in January and February. Annual rainfall averages 547mm-934mm, with most falling between October and March.

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

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

ENGLISH

Diggings
Golf Course
River
Estate
Landing strip
Aerodrome
Canal
Furrow
Conveyor belts
Refinery

AFRIKAANS

Delwery
Gholfbaan
Rivier
Landgoed
Landingstrook
Vliegveld
Kanaal
Voor
Vervoerband
Raffinadery

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 The scale of the topographical map is 1cm represents



- A 5 000 km
- B 500 km
- C 0,5 km
- D 50 000 km

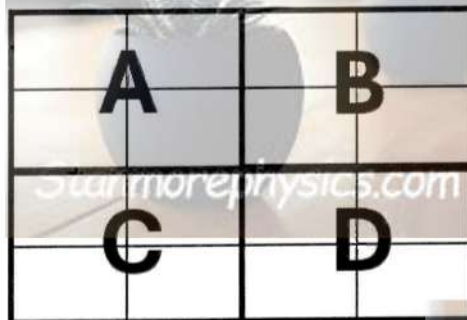
(1 x 1) (1)

3.1.2 The height of the trigonometrical beacon in block C5 is...

- A 145 km
- B 145 m
- C 471,0 km
- D 471,0 m

(1 x 1) (1)

3.1.3 Redraw the following grid diagram and show the position of 2531BC Malelane as it will appear on the index sheet.



(1 x 2) (2)

3.1.4 Determine the coordinates of the windpump in block E2.

(2 x 1) (2)

3.1.5 Refer to the area covered by the orthophoto map on the topographic map and calculate the area in km².

Use the following information :

The length is 1,75 km.

Formula: Area = Length x Breadth

(3 x 1) (3)

3.1.6 A tourist has disembarked from the train and is inquiring about the location of the nearest shop.

Refer to block E1 on the topographical map to assist the tourist with the general direction to the nearest shop.

(1 x 1) (1)

3.2 MAP INTERPRETATION

3.2.1 Refer to the cultivated area in block E4 on the orthophoto map.

i) Name the winds that occur during the nights.

(1 x 1) (1)

ii) How can farmers in block E4 manage the effect of the winds mentioned in QUESTION 3.2.1 i)

(1 x 2) (2)

3.2.2 The table below compares the temperature and reason for the change in temperature in certain areas. Complete the table below on your answer sheet.



Location:	Trig beacon 145 in block C5	Built up area in block E1	Area marked S in block E3
Temperature	Decreases	Increase	3.2.2 (a)...
Reason	...3.2.2 (b)...	Buildings absorb heat	3.2.2 (c)...

(3 x 1) (3)

3.2.3 Refer to **F** and **G** on the topographical map to identify the course of the river. (1 x 1) (1)

3.2.4 Draw a cross profile of the river from **G** to **F**.

Instructions:

Correct shape of the cross profile.
Label the two meander slopes. (3 x 1) (3)

3.2.5 What evidence is there on the map suggesting that Malelane receives seasonal rainfall. (2 x 1) (2)

3.2 GEOGRAPHICAL INFORMATION SYSTEM (GIS)



3.3.1 Classify the following as spatial or attribute data.

i) The location of the fluvial landform marked **H**. (1 x 1) (1)

ii) The shape of the dam in block **B4**. (1 x 1) (1)

3.3.2 Refer to the river in block **D1**.

a) Define the term *buffering*. (1 x 2) (2)

b) Discuss the importance of buffering the river as shown in block **D1**. (1 x 2) (2)

3.3.3 You want to buy a farm in Malelane. Explain how you can use GIS to determine a suitable land for sugar cane farming. (2 x 1) (2)

[30]

TOTAL [150]



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GRADE 12

GEOGRAPHY P1

JUNE 2026 morephysics.com

MARKING GUIDELINES

Stanmorephysics.com

MARKS: 150

This marking guidelines consists of 11 pages.

MARKING PRINCIPLES FOR GEOGRAPHY- NSC JUNE 2026.

The following marking principles have been developed to standardise marking in all schools in the province.

MARKING

- ALL questions MUST be marked, irrespective of whether it is correct or incorrect.
- Where the maximum marks have been allocated for a particular question, place an M over the remainder of the text to indicate the maximum marks have been achieved.
- A clear, neat tick must be used:
 - If ONE mark is allocated, ONE tick must be used:
 - If TWO marks are allocated, TWO ticks must be used:
 - The tick must be placed at the FACT that a mark is being allocated for.
 - Ticks must be kept SMALL, as various layers of moderation may take place.
- Incorrect answers must be marked with a clear, neat cross:
 - Use MORE than one cross across a paragraph/discussion style questions to indicate that all facts have been considered.
 - Do NOT draw a line through an incorrect answer.
 - Do NOT underline the incorrect facts.

For the following action words, ONE word answers are acceptable: **list, name, state, identify**

For the following action words, a FULL sentence must be written: **describe, explain, evaluate, analyse, suggest, differentiate, distinguish, define, discuss, why, how.**
The following action words need to be read within its context to determine whether a ONE- word answer or FULL sentence is required: **provide, what, tabulate and give**

NOTE THE FOLLOWING

- If the numbering is incorrect or left out, as long as the sequence of answers to questions is followed candidates can be credited.
- Spelling errors if recognisable, award the marks provided the meaning is correct.
- Be sensitive to the sense of an answer, which may be stated in a different way.
- In questions where a letter is the accepted response, but the learner writes the actual answer- award marks.
- There will be additional guidelines for the marking of certain questions.

TOTALLING AND TRANSFERRING OF MARKS

- Each sub-question must be totalled.
 - Questions in Section A has five sub-sections, therefore five sub-totals per question required.
 - Section B has three sub-sections and three sub-totals.
 - Sub-section totals to be written in the right-hand margin at the end of the subsection and underlined.
 - Sub-totals must be written legibly.
- Leave room to write in moderated marks on different levels.
- Total sub-totals and transfer total to top left-hand margin next to question number.
- Transfer total to cover of answer book

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

1.1

1.1.1 C (1)

1.1.2 C (1)

1.1.3 C (1)

1.1.4 D (1)

1.1.5 D (1)

1.1.6 D (1)

1.1.7 D (1)

1.1.8 B (1)

(8 x 1) (8)

1.2

1.2.1 Summer (1)

1.2.2 High (1)

1.2.3 Unstable (1)

1.2.4 Increasing (1)

1.2.5 Thermal (1)

1.2.6 Moist (1)

1.2.7 Inversion (1)



1.3

1.3.1 Northern (1)

(1 x 1) (1)

1.3.2 Jamaica is in the northern hemisphere (1)

It is a hurricane (1)

[ANY ONE]

(1 x 1) (1)

1.3.3 Mellisa is the thirteenth tropical cyclone (1)

(1 x 1) (1)

1.3.4 Gusty winds of 406km (2)

It caused catastrophic damages. (2)

[ANY ONE]

(1 x 2) (2)

1.3.5 No moist from ocean to generate latent heat (2)

Dry air enters the system (2)

Friction on land cause the wind to slow down (2)

[ANY TWO]

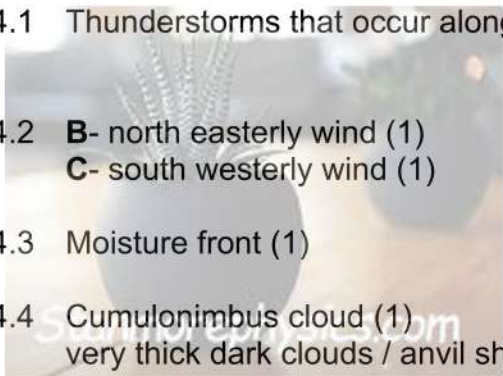
(2 x 2) (4)

- 1.3.6 Move people from low lying areas to high lying areas (2)
- Always giving updates through media (2)
- Educating people on how to minimize the impact of the tropical cyclone. (2)
- Moving people to community centres to accommodate them. (2)
- Providing people with food, blankets and clothing. (2)
- Putting sandbags along the river banks to prevent flooding. (2)
- [ANY THREE]** (3 x 2) (6)



1.4

- 1.4.1 Thunderstorms that occur along the moisture front in summer. (2)
(1 x 2) (2)
- 1.4.2 **B-** north easterly wind (1)
C- south westerly wind (1) (2 x 1) (2)
- 1.4.3 Moisture front (1) (1 x 1) (1)
- 1.4.4 Cumulonimbus cloud (1)
very thick dark clouds / anvil shape (1) (2 x 1) (2)
- 1.4.5 Trigger flash flooding (2)
- Produce heavy hail that can decimate crops and livestock(2),
- Leading to massive economic losses for the agricultural sector(2)
- The associated gale-force winds (2)
- Frequent lightning strikes pose severe risks to infrastructure (2)
- Loss of human life,
- Cause power outages (2)
- Structural damage (2).
- Leads to rapid runoff rather than deep soil penetration, (2)
- Causing significant soil erosion. (2)
- [ANY FOUR]** (4 x 2) (8)



1.5

- 1.5.1 It increases (1) (1 x 1) (1)
- 1.5.2 Buildings absorb and retain heat (2) (1 x 2) (2)
- 1.5.3 Johannesburg has high air pollution due to cars and factors.(2)
- More hygroscopic nuclei for condensation.(2)
- Greater instability and strong convection over built-up areas can cause vertical cloud development (2) (2 x 2) (4)

PART MARKING:

- High pollution (1)
- Hygroscopic nuclei (1)
- Strong convection (1)
- [MAX TWO MARKS]**



1.5.4 Rural areas more vegetation(trees) plants undergo evapotranspiration, a process where they release water vapor into the atmosphere. This acts as a natural "air conditioner,". (2)
 Many water sources that have a cooling effect. - consuming heat energy from the air to evaporate the water, thereby cooling the surrounding environment.(2) (2)
 Less cars releasing carbon monoxide to increase temperatures. (2)
 Less concrete surfaces that absorb heat impermeable surfaces like asphalt, concrete, and brick. These dark materials have a low albedo (reflectivity), meaning they absorb and store a massive amount of solar radiation (2) Stanmorephysics.com
 Urban areas, with fewer trees and more drainage systems that whisk rainwater away, lack this significant cooling mechanism (2)

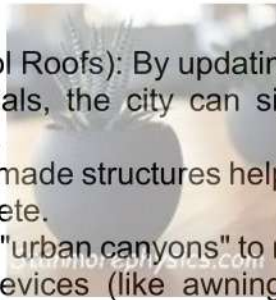
[ANY TWO] (2 x 2) (4)

PART MARKING:

- More vegetation (1)
- More water bodies (1)
- Less cars (1)
- Less concrete surfaces (1)

[MAX TWO MARKS]

1.5.5 Building should expand horizontally not vertically (2)
 Create spaces between buildings. (2)
 Having roof top gardens. (2)
 Use light paint. (2)
 Reflective Building Materials (Cool Roofs): By updating building codes to require high-reflectivity materials, the city can significantly lower indoor and outdoor temperatures.
 Increasing "green cover" on man-made structures helps counteract the heat-retaining properties of concrete.
 Urban Design & Airflow: Planning "urban canyons" to maximize natural ventilation and using shading devices (like awnings or trees over pavements).



[ANY THREE] (3 x 2) (6)
[60]

QUESTION 2: GEOMORPHOLOGY

2.1

2.1.1 Y (1)

2.1.2 Z (1)

2.1.3 Y (1)

2.1.4 Z (1)

2.1.5 Y (1)

2.1.6 Y (1)

2.1.7 Y (1)

2.1.8 Z (1)

(8 x 1) (8)

2.2

2.2.1 B (1)

2.2.2 B (1)

2.2.3 A (1)

2.2.4 A (1)

2.2.5 B (1)

2.2.6 B (1)

2.2.7 B (1)

(7 x 1) (7)



2.3

- 2.3.1 A – dendritic (1) (2 x 1) (2)
B – Trellis (1)
- 2.3.2 Igneous rock (1) (1 x 1) (1)
- 2.3.3 A – acute angles (2)
B - 90° bends (2)
Right angle (2) (2 x 2) (4)
- 2.3.4 The higher the density the higher the stream order(2) (1 x 2) (2)
- 2.3.5 Steep slopes (2)
Impermeable rock (2)
Low evaporation (2)
Sparse vegetation. (2)
High, consistent rainfall (2)
Low soil infiltration rates (2)
[ANY THREE] (3 x 2) (6)

2.4

- 2.4.1 When a more energetic river captures the headwaters of a less energetic river (2) (1 x 2) (2)
[CONCEPT]
- 2.4.2 A steeper gradient (on the one side of the watershed) (2)
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)
- 2.4.3 X- elbow of capture (1)
Y – wind gap (1) (2 x 1) (2)
- 2.4.4 Headward erosion (2) (1 x 2) (2)
- 2.4.5 River 1 (1) (1 x 1) (1)
- 2.4.6 River 1 has an increased volume of water (2) (1 x 2) (2)
- 2.4.7 **Reduction in Water Velocity and Volume:** The volume of water significantly decreases, transforming the stream into a smaller, low-energy channel compared to its original size. (2)
Increased Sedimentation : With reduced energy, the river deposits excess sediment, making the riverbed shallower and narrower. (2)
(2 x 2) (4)

2.5



2.5.1 Humans (1)
Factories (1)
Farming (1) (1 x 1) (1)

2.5.2 diarrhoea (2)
typhoid (2)
water borne diseases (accept examples)(2)
[ANY ONE] Stanmorephysics.com (1 x 2) (2)

2.5.3 Degradation of Water Quality and Aquatic Ecosystems (accept examples)(2)
Physical Disruption of the River Habitat (accept examples)(2)
Solid Waste and Plastic Accumulation (accept examples)(2)
[ANY TWO] (2 x 2) (4)

2.5.4 Agricultural Productivity and Food Security (2)
Industrial Power Generation and Economic Growth (2)
Industrial Water Supply: (2)
Flood Mitigation: (2)
Reduced Treatment Costs (2)
[ANY TWO] (2 x 2) (4)

2.5.5 **Enhanced Water Quality and Filtration**
Buffer zones act as filters that reduce sediment, nutrient and pesticide loads from overland surface runoff. (2)
Preventing Eutrophication: By capturing pollutants before they enter the water, buffers prevent excessive nutrient loading that causes harmful algae (2)
Vegetation helps filter pollutants out of shallow groundwater before it discharges into the river. (2)
Flood Risk Reduction and Drought Mitigation
Slowing Water Velocity: The vegetation in buffer zones (grasses/trees) acts as a physical barrier that which slows down surface runoff during heavy rain. (2)
Improving Infiltration: By slowing the water, it allows more time for water to seep into the ground, recharging groundwater supplies and reducing the peak volume of floods. (2)
Drought Resistance: Increased water retention in the soil and groundwater helps maintain higher base flows in the river during dry periods. (2)
Structural Stability and Erosion Control
The deep roots of trees and shrubs in riparian zones hold soil in place, significantly reducing riverbank erosion and minimizing land loss. (2)
Reduced Siltation: By preventing bank collapse and trapping sediment, buffers prevent silt from choking the riverbed, which maintains healthy habitats for aquatic invertebrates and fish spawning.(2)
Biodiversity and Ecological Connectivity
Habitat Provision: Buffer zones provide vital habitats and food sources (leaf litter) for both aquatic and terrestrial wildlife. (2)

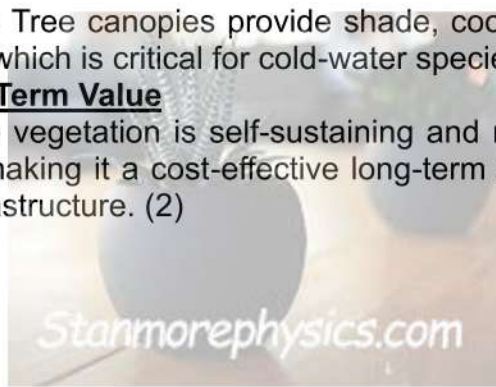


Temperature Regulation: Tree canopies provide shade, cooling the water during hot weather, which is critical for cold-water species. (2)

Sustainability and Long-Term Value

Low Maintenance: native vegetation is self-sustaining and requires little to no maintenance, making it a cost-effective long-term solution compared to concrete infrastructure. (2)

[ANY TWO]



(2 x 2)

(4)

[60]



SECTION B

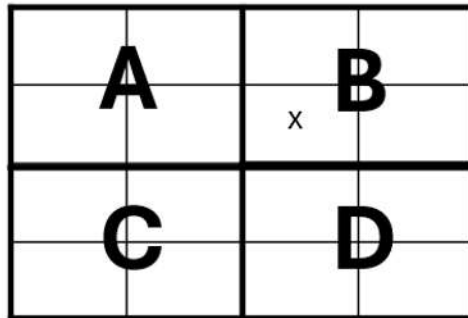
QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 C (1)

3.1.2 D (1)

3.1.3



(1) (1 x 2) (2)

3.1.4 25°29'35"S (1) 31°31'43"E (1)

(2 x 1) (2)

3.1.5 A = l x b
 1,75km x 3,2 (1) cm x 0,5)
 1,75km x 1,6 (1) km
 = 2,8 km² (1)

[Range: 3,0 – 3,3]
 [Range: 1,5 – 1,65]
 [Range: 1,5 – 1,65]

(3 x 1) (3)

3.1.6 South West (1)

(1 x 1) (1)

3.2 MAP INTERPRETATION

3.2.1 i) Katabatic winds (1)

(1 x 1) (1)

- ii) Plant frost resistant crops.(2)
- Cover crops with nets. (2)
- Use green houses to warm the crops(2)

[ANY ONE]

(1 x 2) (2)
 (3 x 1) (3)

3.2.2 a) Decreases (1)

b) Altitude (1)

c) Natural features / vegetation (1)

(3 x 1) (3)

3.2.3 Lower course (1)

(1 x 1) (1)



3.2.4



G

Slip-off (1)

F

Undercut (1)

Shape (1)

(3 x 1) (3)

3.2.5 Presence of dams(1)
Canals (1)
Reservoirs (1)
[ANY TWO]

(2 x 1) (2)

3.2 GEOGRAPHICAL INFORMATION SYSTEM (GIS)

i) Spatial (1).

(1 x 1) (1)

ii) Attribute (1).....

(1 x 1) (1)

3.3.2 a) The demarcation of an area (2) Stanmorephysics.com

(1 x 2) (2)

b) To prevent any development closer to the river (2)
Prevent unauthorised people from using the river.(2)
Prevent pollution of the river.(2)
[ANY ONE]

(1 x 2) (2)

3.3.3 Will assess the type of soil to plant suitable crops (1)
Determine the drainage to check availability of water.(1)
Will determine the slope of the land.(1)
Will determine the soil fertility. (1)
[ANY TWO]

(2 x 1) (2)
[30]

TOTAL 150