education

MPUMALANGA PROVINCE

REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

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GEOGRAPHY P1

SEPTEMBER 2025

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MARKS: 150

TIME: 3 HOURS

This question paper consists of 16 pages.

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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.

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 2527 CA RUSTENBURG WEST and a 1 : 10 000 orthophoto map 2527 CA 20 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.

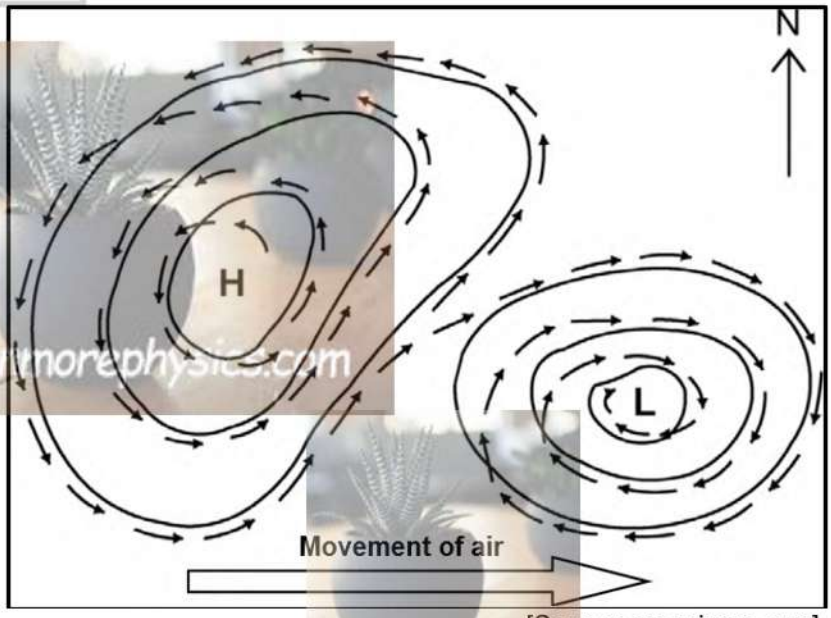
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SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

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 numbers (1.1.1 to 1.1.7), e.g. 1.1.8 D.

Refer to the high- and low-pressure cells below to answer QUESTION 1.1.1 – 1.1.4.



[Source: examiners own]

1.1.1 The above pressure cells are found in the … hemisphere.

A Northern
B Eastern
C Southern
D Western

1.1.2 Weather conditions associated with high pressure cells are … and …

i unstable
ii stable
iii dry
iv rainy

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

1.1.3 The force that influences the speed at which air travels between a high and low pressure.

A Coriolis
B Gradient
C Wind
D Pressure gradient

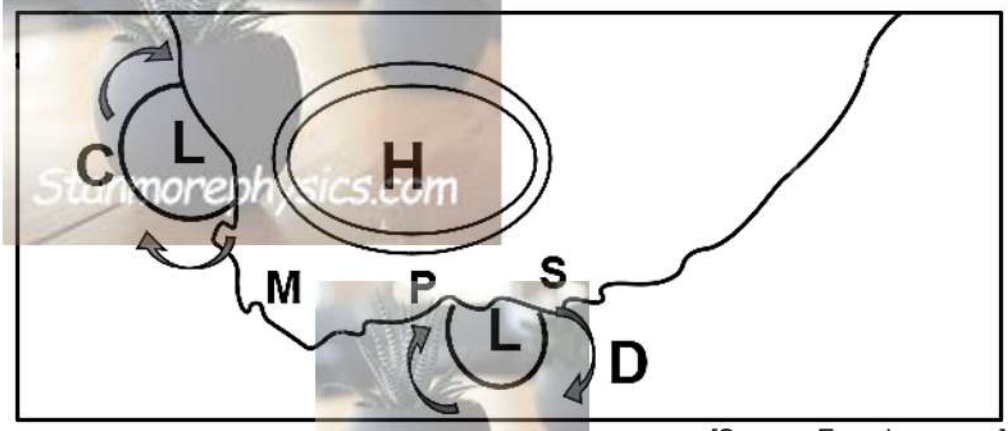
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1.1.4 The low-pressure cell is associated with … air and … surface winds.

i descending
ii ascending
iii converging
iv diverging

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

Refer to the diagram below to answer QUESTION 1.1.5 – 1.1.7



[Source: Examiners own]

1.1.5 The temperature and moisture content associated with pressure cell **C.**

i Warm temperatures
ii Cool temperatures
iii High moisture
iv Low moisture

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

1.1.6 Place … will experience berg winds.

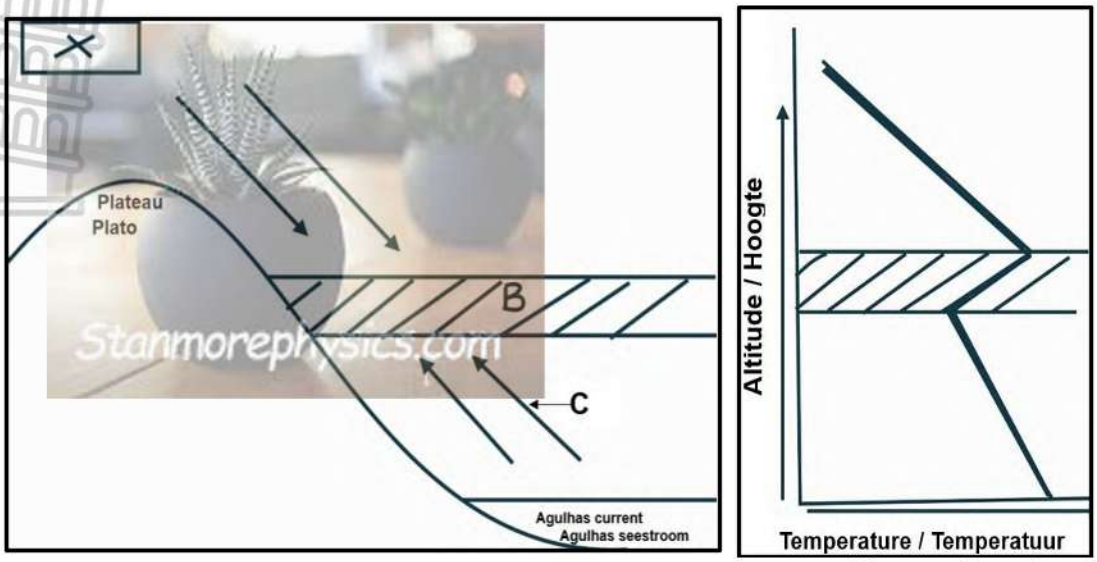
A M
B P
C S
D H

1.1.7 Pressure cell **D** is associated with …

A heavy rainfall
B thunderstorms
C strong winds
D fog and drizzle (7 x 1) (7)

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1.2 Refer to the cross section on the eastern half of the country. Complete the statements in COLUMN A with the options in COLUMN B. Write only **Y** or **Z** next to the question numbers (1.2.1 to 1.2.8), e.g. 1.2.9 Y.



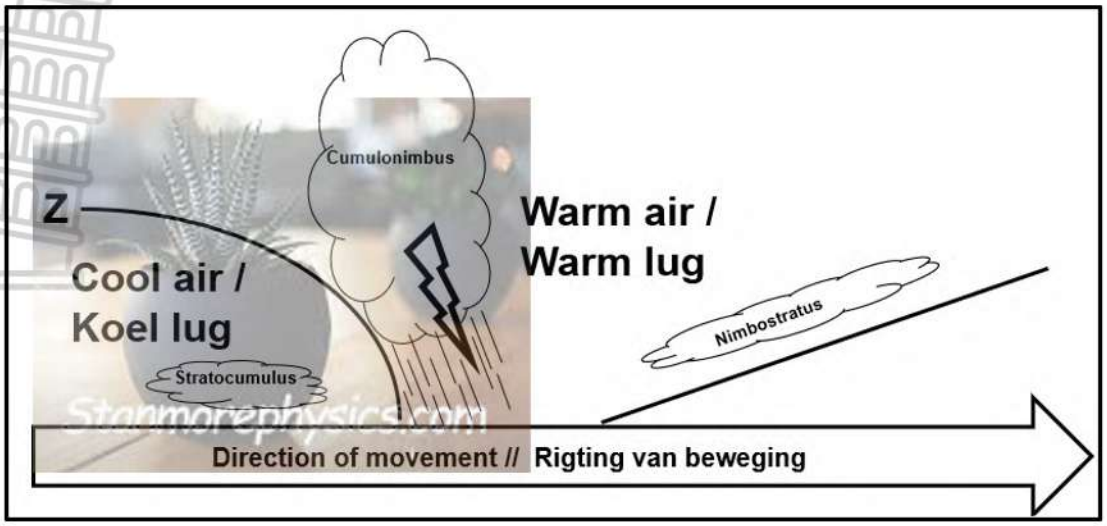
[Source: Examiners]

	COLUMN A		COLUMN B
1.2.1	The pressure cell responsible for the descending air in the interior marked **X** on the diagram is called …	**Y** **Z**	South Indian HP Kalahari HP
1.2.2	The area marked **B** is the …	**Y** **Z**	inversion layer thermal belt
1.2.3	The temperature at **C** … as altitude increases.	**Y** **Z**	increase decrease
1.2.4	The diagram represents … conditions.	**Y** **Z**	summer winter
1.2.5	The possibility of rain over the interior is …	**Y** **Z**	high low
1.2.6	The descending air from the plateau will … as it descends.	**Y** **Z**	warm cool
1.2.7	The reason for the descending air temperature change is due to adiabatic …	**Y** **Z**	cooling warming
1.2.8	The moisture and temperature content of the air mass at **C** is …	**Y** **Z**	cold and dry warm and moist

(8 x 1) (8)

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1.3 The diagram below shows a cross-section of a cold front.



[Source: Examiners own]

1.3.1 Give evidence from the diagram that **Z** shows a cold front. (1 x 1) (1)

1.3.2 Why do cumulonimbus clouds develop along front **Z**? (1 x 2) (2)

1.3.3 Once the cold front passes over, air pressure will increase. Explain why this is the case. (1 x 2) (2)

1.3.4 Account for the direction of movement of this phenomenon. (1 x 2) (2)

1.3.5 With reference to the diagram, write a paragraph of approximately EIGHT lines in which you explain the development of a cold front occlusion. (4 x 2) (8)

1.4 Refer to the infographic on tropical cyclones.

Hurricane Helene could form by Wednesday

Tropical storm and storm surge watches have been issued along portions of Florida's south western coast. Maximum sustained winds have remained at 35 mph (56km) since 5 p.m. Over the South eastern U.S., Hurricane Helene is expected to produce total rain accumulations of 3 to 6 inches (76mm) with isolated totals of around 10 inches (254mm).

[Source: https://shorturl.at/5uSWX]



[Source: https:// emergencies-hub/typhoon]

1.4.1 Where do hurricanes occur? (1 x 1) (1)

1.4.2 Account for the name given to this hurricane. (1 x 1) (1)

1.4.3 According to the text what weather elements could cause destruction in this area. (2 x 1) (2)

1.4.4 State why the wind on the cartoon is an appropriate representation of a tropical cyclone. (1 x 1) (1)

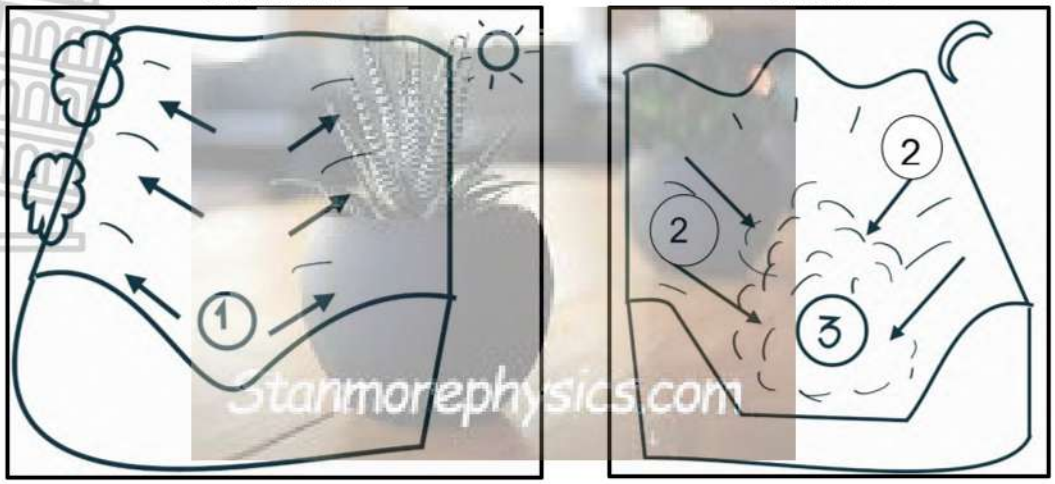
1.4.5 Explain factors necessary for the formation of Hurricane Helene. (2 x 2) (4)

1.4.6 According to the infographic there are "THINGS TO DO AFTER A HURRICANE". Explain how these practises can limit injuries and save lives. (3 x 2) (6)

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1.5 Study the infographic below on valley climates to answer the questions.

Sketch A **Sketch B**



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Learn to Paraglide Guide



Paragliders are powered by the wind. Wind direction is important because, for all aircraft (including birds), it is best to take off into the wind. It reduces the ground speed needed to reach flying speed, and so it reduces the need to run. Terrain features such as mountains, valleys, forests and shorelines, generate local wind patterns of which all pilots, especially free-flying pilots, need to be aware.

[Source: https://www.flyingfever.net/learn-to-paraglide-online-guide]

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1.5.1 Name the wind labelled **1** and **2** respectively. (2 x 1) (2)

1.5.2 a) Wind (**1/2**) will develop when a higher pressure occurred on the valley floor. (1 x 1) (1)

b) Give a reason for your answer to QUESTION 1.5.2a). (1 x 2) (2)

1.5.3 Explain how wind **2** forms. (2 x 2) (4)

1.5.4 What causes less visibility on the valley floor in sketch **B** during winter mornings? (1 x 1) (1)

1.5.5 a) (Katabatic/Anabatic) winds are best for paragliders during taking off from a hill? (1 x 1) (1)

b) Give a reason for your answer to QUESTION 1.5.5a). (1 x 2) (2)

1.5.6 Why is area **3** is not suitable for the planting of all types of crops? (1 x 2) (2)

[60]

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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 2.1.7), e.g. 2.1.8 D.

2.1.1 The point where one river in the network joins another.

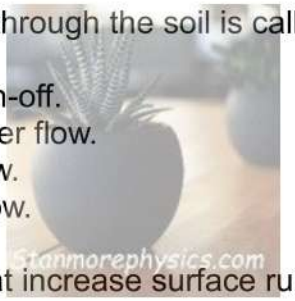
A Interfluves
B Tributary
C Confluence
D River system

2.1.2 The ridges of high ground between the individual channels of the stream network.

A Watersheds
B Interfluves
C Confluence
D Tributaries

2.1.3 Water flowing through the soil is called …

A surface run-off.
B groundwater flow.
C throughflow.
D channel flow.



2.1.4 The factors that increase surface run-off.

i Steep gradients
ii Gentle gradients
iii More vegetation
iv Less vegetation

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

2.1.5 This rivers have their sources in a humid, rainy region and then later flow through a dry, arid region.

A Exotic rivers
B Episodic rivers
C Periodic rivers
D Permanent rivers

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2.1.6 Factors that will cause a low drainage density.

i Areas with high evaporation rates
ii Regions with a high rainfall
iii Large amount of infiltration
iv Areas with softer rock

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

2.1.7 The amount of water across the width of the river flowing past a point in a given time is called the … of a river.

A discharge
B flow
C volume
D speed (7 x 1) (7)

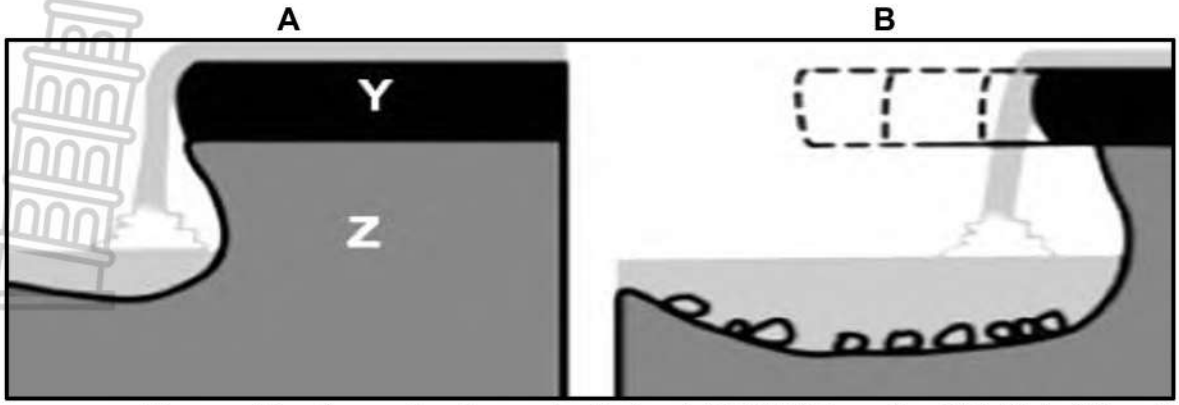
2.2 Column A describes characteristics of a certain drainage pattern and Column B gives possible drainage patterns. Choose the correct response, only write **Y** or **Z** next to the question numbers e.g., 2.2.9 Z

	COLUMN A	COLUMN B
2.2.1	Where underlying rocks are uniform in their resistance to erosion.	**Y** Trellis **Z** Dendritic
2.2.2	Underlying rocks with alternating bands of hard and soft rock.	**Y** Trellis **Z** Dendritic
2.2.3	This drainage pattern is common in areas with volcanoes, hills or domes.	**Y** Centripetal **Z** Radial
2.2.4	Short tributaries joining the main streams at right angles.	**Y** Trellis **Z** Rectangular
2.2.5	Streams flowing into a central pan or low lying area.	**Y** Radial **Z** Centripetal
2.2.6	Forms on igneous rock that has joints and cracks.	**Y** Parallel **Z** Rectangular
2.2.7	Develop on a land surface that was covered by an ice sheet or glacier.	**Y** Trellis **Z** Deranged
2.2.8	Develops on a surface that slopes uniformly but is fairly steep.	**Y** Parallel **Z** Rectangular

(8 x 1) (8)

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2.3 Study the diagram below illustrating a waterfall.



[Source: https://www.aleve/wp-content/uploads/2018/04/Formation-Of-A-Waterfall.png]

2.3.1 A waterfall is a (temporary/permanent) base level of erosion. (1 x 1) (1)

2.3.2 Identify the type of rock at **Y** and **Z** respectively. (2 x 1) (2)

2.3.3 Except for waterfalls, name ONE other fluvial landform caused by erosion. (1 x 1) (1)

2.3.4 a) In which course of the river are waterfalls mostly found. (1 x 1) (1)

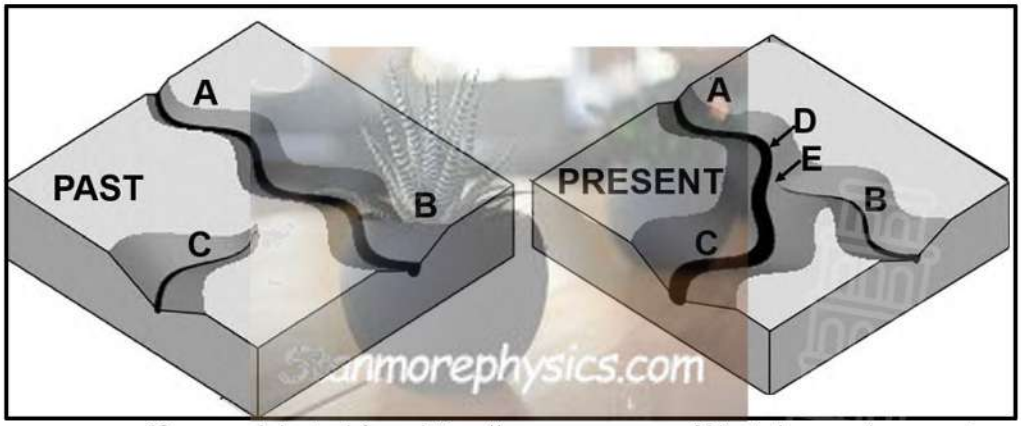
b) State the dominant fluvial process in this course of the river. (1 x 2) (2)

2.3.5 Explain how erosion in sketch **B** cause the waterfall to move upstream? (2 x 2) (4)

2.3.6 Explain how waterfalls impact river grading. (2 x 2) (4)

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2.4 Study the diagram below on river capture.



[Source: Adapted from https://www.quora.com/What-does-a-river-capture-mean]

2.4.1 Define *river capture.* (1 x 2) (2)

2.4.2 What type of erosion is dominant at river capture? (1 x 1) (1)

2.4.3 Name the features labelled **B**, **D** and **E** on the diagram. (3 x 1) (3)

2.4.4 State THREE conditions that will increase the possibility of river capture. (3 x 1) (3)

2.4.5 Explain how the characteristics of the river labelled **C** will change after river capture. (3 x 2) (6)

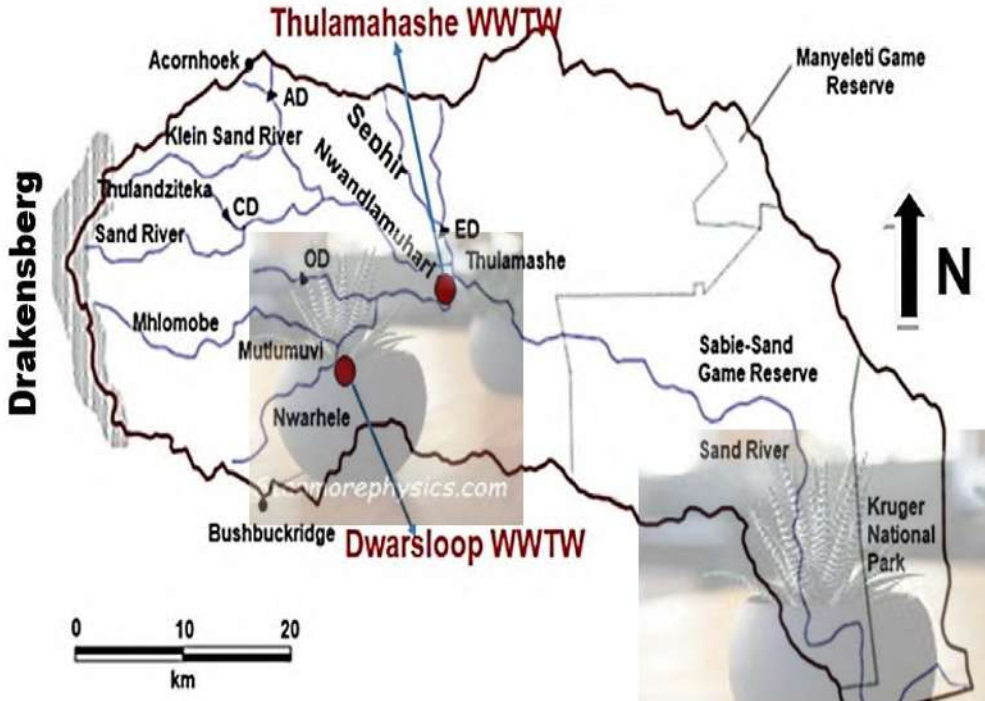
2.5 Study the infographic below on the water crisis in Bushbuckridge.

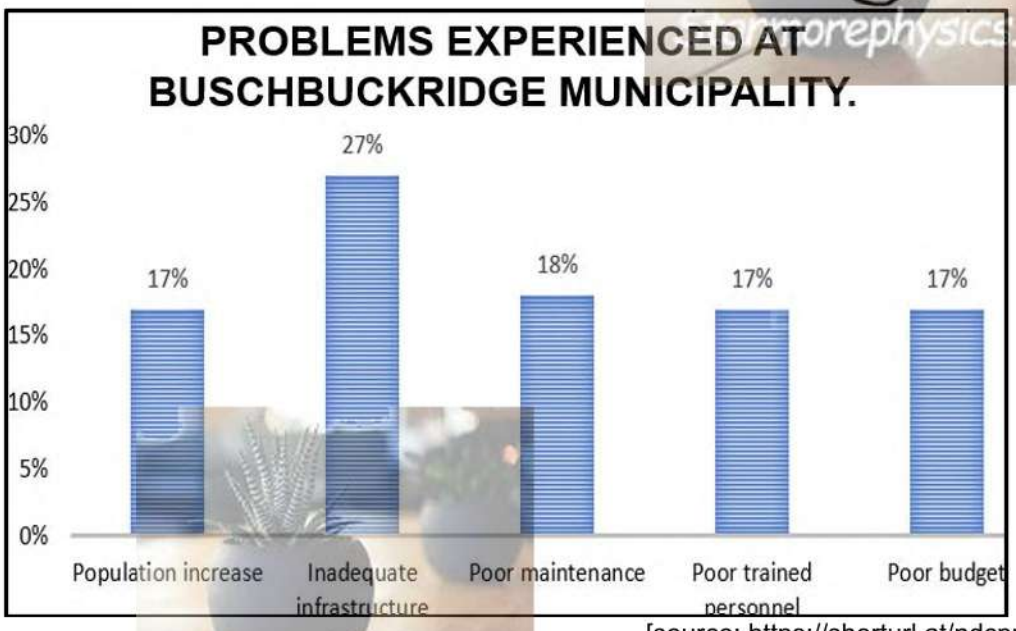
Water crisis deepening in Bushbuckridge

Bushbuckridge's water challenges seem to be escalating daily and the last two months have been a nightmare for some communities in this area. In the last ten years the Bushbuckridge Local Municipality (BLM) has dismally failed to render potable water supply to most villages in Bushbuckridge. High E.coli counts could have been caused by overflows from sewage system infrastructure manholes, illegal dumping of solid waste material, burst sewage reticulation pipelines, and non-functional pump stations.

E. coli *are germs called bacteria found in the environment, water, and the intestines of people and animals.*

[Source: http://surl.li/fembkt]





[source: https://shorturl.at/ndcpn]

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2.5.1 Identify the mountain range where rivers in this catchment area originate. (1 x 1) (1)

2.5.2 What is the purpose of the Waste Treatment works at Dwarsloop and Thulamahashe. (1 x 1) (1)

2.5.3 What could have caused the high E coli counts in the Bushbuckridge water? (1 x 1) (1)

2.5.4 According to the graph, what is the main cause of the problems experienced by the Bushbuckridge Municipality. (1 x 2) (2)

2.5.5 Suggest a strategy the Bushbuckridge municipality can implement to overcome the problems mentioned in QUESTION 2.5.4. (1 x 2) (2)

2.5.6 In a paragraph of approximately EIGHT lines, explain the importance of sustainable management of drainage basins and catchment areas. (4 x 2) (8)

[60]

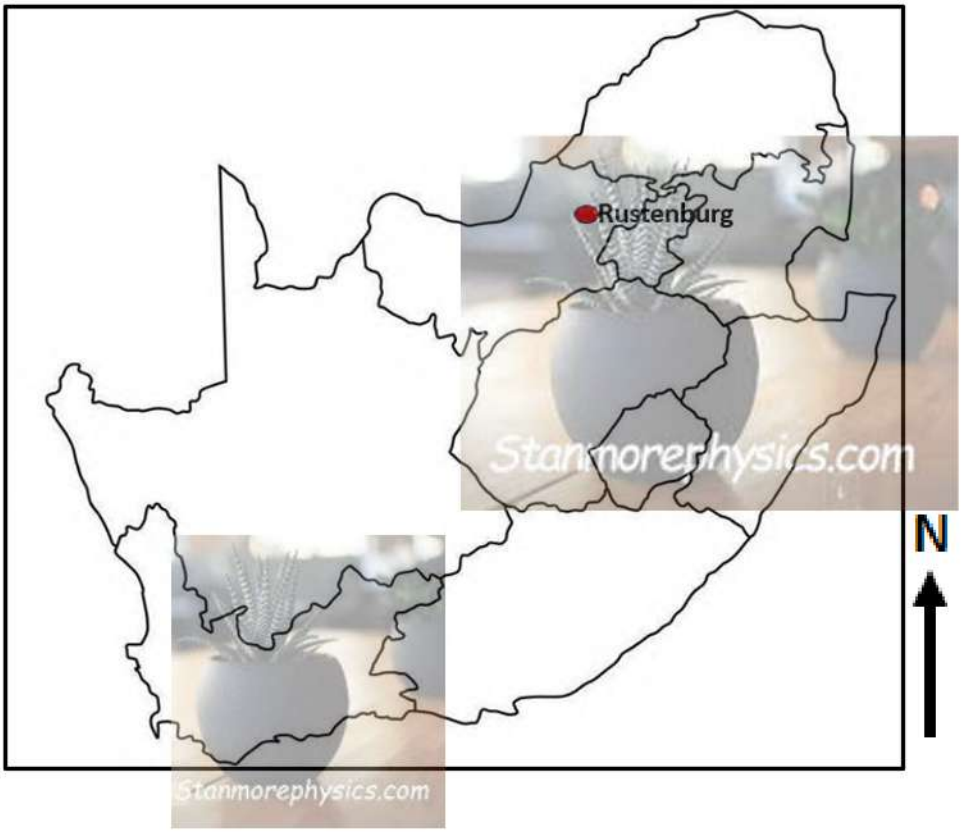
TOTAL SECTION A:120



SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON RUSTENBURG WEST



COORDINATES: **25°40′00″S 27°14′34″E**

Rustenburg is a city at the foot of the Magaliesberg mountain range. Rustenburg is the most populous city in North West province, South Africa.

Rustenburg has a humid subtropical climate, with a relatively high degree of diurnal temperature variation due to the high elevation. It has very warm summers (from December to February) and mild winters (from June to August). Due to the altitude, summers are not quite as hot as one might expect. Precipitation occurs mainly in summer. There is occasional frost at night in winter.

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

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

ENGLISH	**AFRIKAANS**
Diggings	Delwerye
Golf Course	Gholfbaan
River	Rivier
Sewerage Works	Rioolwerke
Estate	Landgoed
Mud flats	Modder plate
Nature Reserve	Natuurreservaat

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3.1 MAP SKILLS AND CALCULATIONS

3.1.1 Rustenburg is situated in … province.

A. Gauteng.
B. Limpopo.
C. Mpumalanga.
D. North West. (1 x 1) (1)

3.1.2 The height of the contour line marked **C** on the topographic map.

A. 1680m
B. 1600m
C. 1620m
D. 1640m (1 x 1) (1)

3.1.3 Refer to the spot height 1316 (block **E3**) and trig. beacon 205 (block **E4**) on the orthophoto map.

a) Determine the difference in height between the two points. (1 x 1) (1)

b) Calculate the distance between the spot height and trig. beacon in metres. (2 x 1) (2)

c) Use your answer to QUESTION 3.1.3 a) and b) to calculate the gradient between the spot height and the trig. beacon.

Formula: **Average gradient = $\frac{\text{Vertical interval (VI)}}{\text{Horizontal equivalent (HE)}}$** (2 x 1) (2)

3.1.6 The mean magnetic declination shown on the map was calculated in December 2024, The total annual change is **44'**w. Determine the magnetic declination for 2025. (2 x 1) (2)

3.1.7 Why is it important to calculate magnetic declination? (1 x 1) (1)

3.2 MAP INTERPRETATION

3.2.1 The feature labelled **1** on the orthophoto map is a …

A. river
B. plantation
C. dam
D. recreational area (1 x 1) (1)

3.2.2 Refer to the areas marked **A** and **B** on the topographic map.

a) Which area will show higher temperatures? (1 x 1) (1)

b) Give ONE reason for your answer to QUESTION 3.2.2 a). (1 x 1) (1)

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c) Give the term that describes this phenomenon. (1 x 1) (1)

3.2.3 Refer to the encircled river in block **C/D3.**

a) Identify the drainage pattern of the river in block C/D3. (1 x 1) (1)

b) Give TWO characteristics of this drainage pattern, evident on the map, to substantiate your answer to QUESTION 3.2.3 a) (2 x 1) (2)

3.2.4 Determine the stream order at **X** in block **B2**. (1 x 1) (1)

3.2.5 Locate the river at **D** in block **B1**.

a) This area is known as the (source/mouth) of the river. (1 x 1) (1)

b) The type of erosion dominant in this course of the river. (1 x 1) (1)

c) Is this river a perennial or non-perennial river? Motivate your answer. (2 x 1) (2)

3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1 An advantage to use secondary data.

A Data is accurate
B Data is reliable
C Information may be biased
D Cheaper to obtain (1 x 1) (1)

3.3.2 … is an example of Primary data.

A Census data
B Topographic map
C Surveying
D Newspaper article (1 x 1) (1)

	3.3.3	Refer to the N4 on the topographic map.		
		(a)	Explain how data integration assisted city engineers when they planned the development of the railway tracks. (1 x 2)	(2)
		(b)	Data for the orthophoto map was gathered through the process of remote sensing. Define remote sensing? (1 x 2)	(2)
		(c)	How did remote sensing assist developers in the development of the N4 along blocks D4 and D5? (1 x 2)	(2)

[30]

GRAND TOTAL: 150

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