



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 12

GEOGRAPHY P1

JUNE 2024

MARKS: 150

TIME: 3 hours



This question paper consists of 18 pages

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 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 must state, name, identify or list.
10. Units of measurement MUST be indicated throughout your calculations, 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.

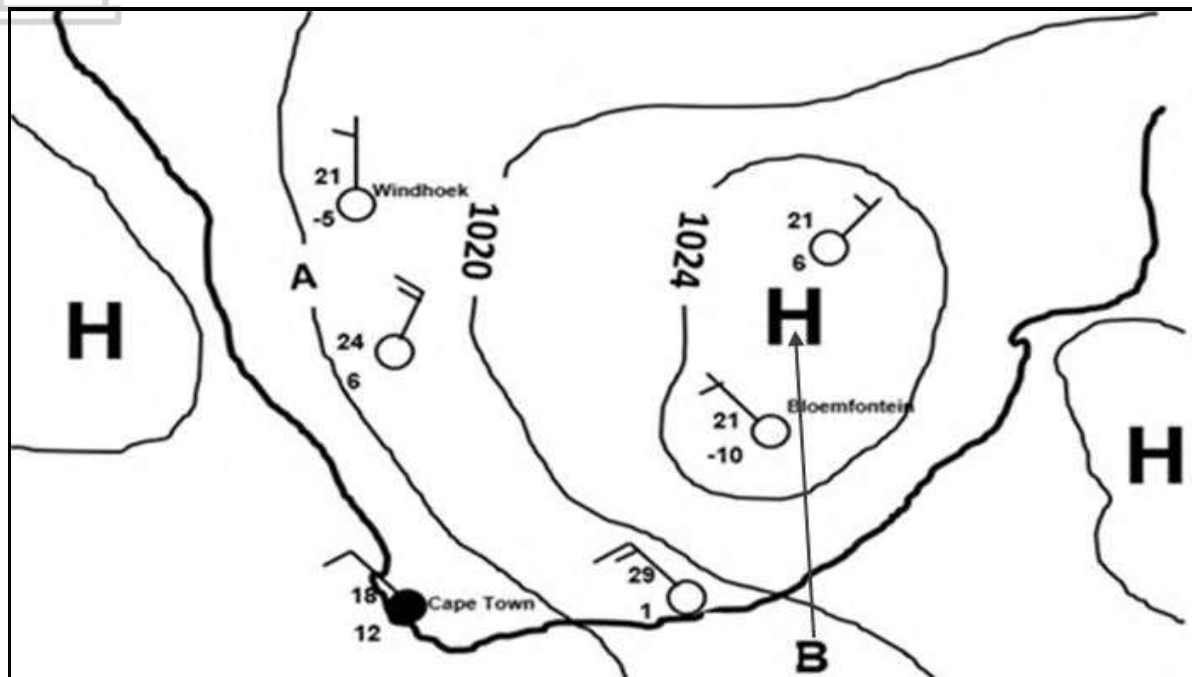
SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

14. A 1 : 50 000 topographic map 3325DC GQEBERHA and 3325 DC 23 orthophoto 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 steps in calculations.
17. You must hand in the topographic and orthophoto map to the invigilator at the end of this examination.

SECTION A: CLIMATE & WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

1.1 Refer to sketch below showing a synoptic weather map. 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) in the ANSWER BOOK, e.g. 1.1.9 D.



[Source: weathersa.co.za]

1.1.1 The pressure cell labelled **B** in the above sketch is ...

- A Kalahari High Pressure.
- B South Indian High Pressure.
- C South Atlantic High Pressure.
- D Coastal Low Pressure.

1.1.2 The season represented by the synoptic weather map is ...

- A summer.
- B autumn.
- C winter.
- D spring.

1.1.3 Lines labelled **A** on the sketch is...

- A contour line.
- B isotherm.
- C isobar.
- D latitude.

1.1.4 The wind direction evident on Cape Town weather station model is ...

- A from Northwest to Southeast.
- B from Southeast to Northwest.
- C from Southwest to Northeast.
- D from Northeast to Southwest.

1.1.5 Pressure labelled **B** will result into ...

- A stable weather conditions.
- B unstable weather conditions.
- C formation of clouds.
- D rainy conditions.

1.1.6 Isobaric interval of synoptic weather map/chart in sketch above is ... hPa.

- A 2
- B 4
- C 6
- D 8

1.1.7 Wind speed at Bloemfontein weather station is ... knots.

- A 5
- B 10
- C 15
- D 20

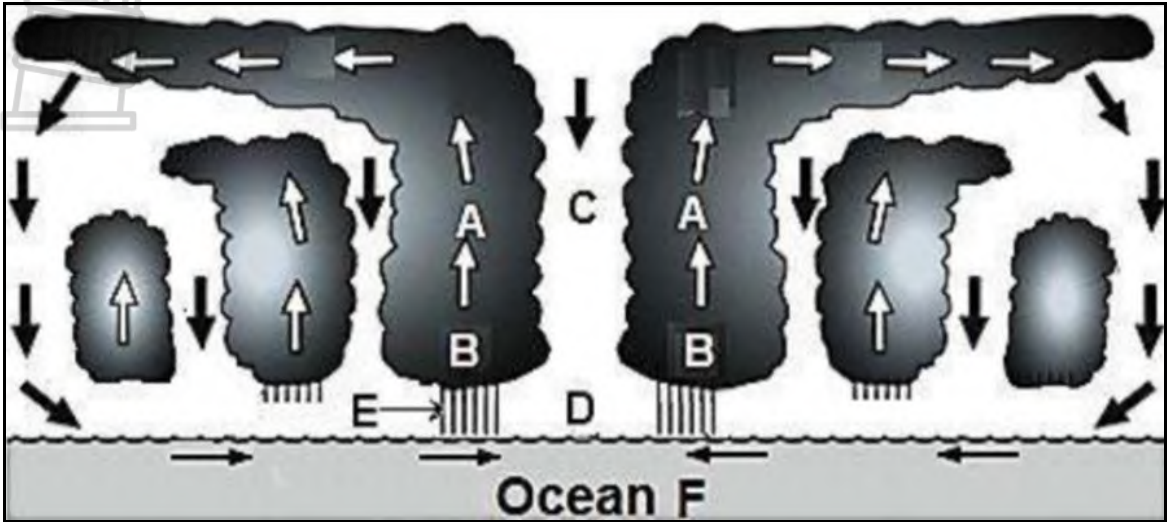
1.1.8 Outward curve or elongation of isobars away from a high-pressure cell is ...

- A ridge.
- B trough.
- C saddle.
- D moisture front.

(8 x 1) (8)



1.2 Refer to the sketch below showing a cross-section through a tropical cyclone in the Southern Hemisphere. Complete the statement in COLUMN A with the options in COLUMN B. Write only **Y** or **Z** next to the question numbers(1.2.1 to 1.2.7) in the ANSWER BOOK, e.g. 1.2.8 **Z**.

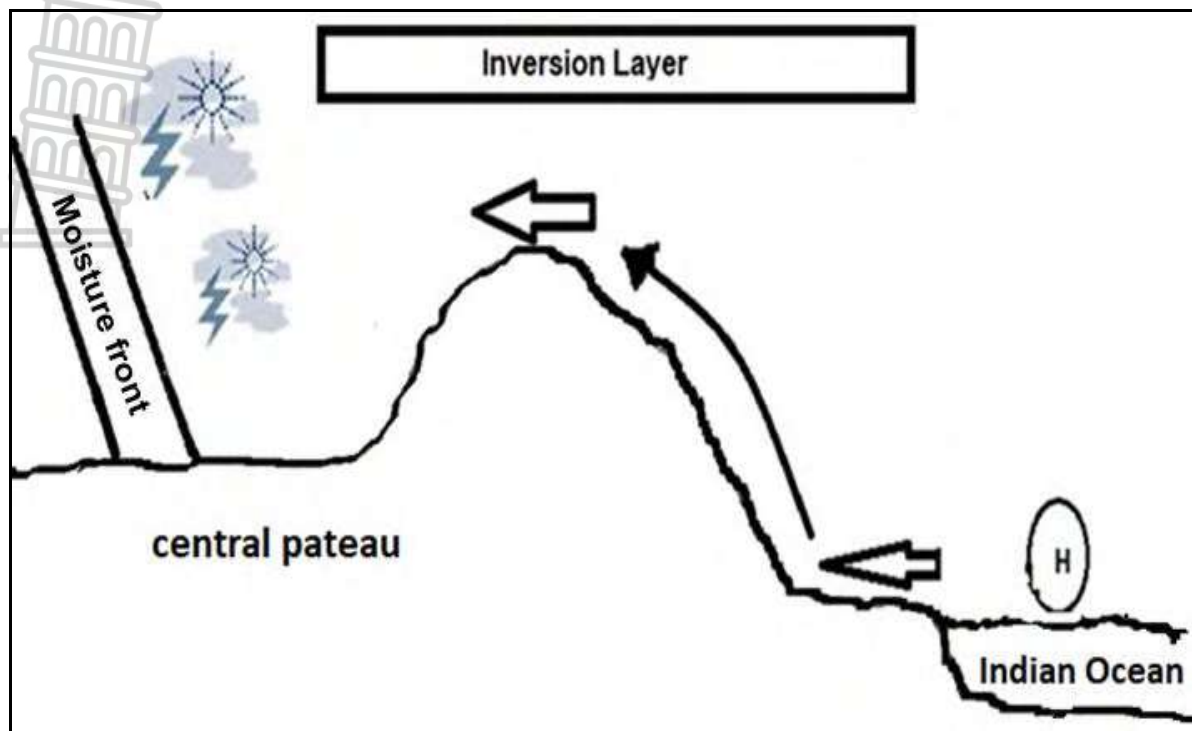


[Adapted from: studocu.com]

COLUMN A	COLUMN B
1.2.1 Area labelled C is an ...	Y eyewall Z eye
1.2.2 Cloud labelled B is ... cloud	Y stratus Z cumulonimbus
1.2.3 The air at D is ...	Y diverging Z converging
1.2.4 Precipitation type labelled E is ...	Y snow Z heavy rainfall
1.2.5 Ocean labelled F is found between these latitudes ...	Y 5°-30° Z 60°- 90°
1.2.6 Air circulation at C is ...	Y clockwise Z anticlockwise
1.2.7 Movement of weather system in figure 1.2 is ...	Y eastwards Z westwards

(7 x 1) (7)

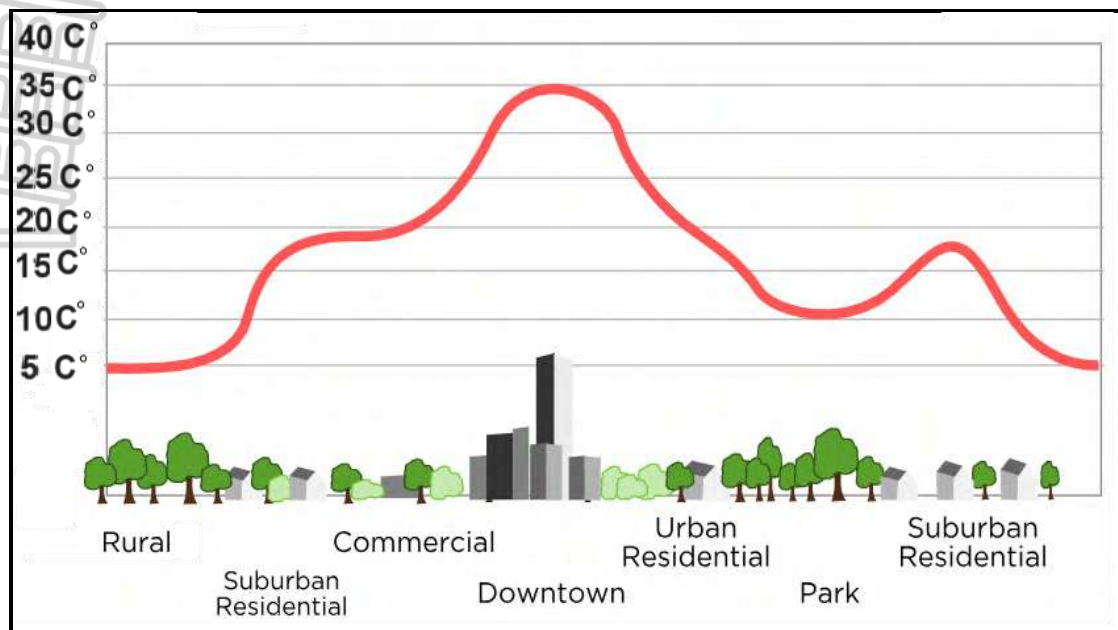
1.3 Refer to sketch below showing line thunderstorms.



[Source: Examiner's own sketch]

- 1.3.1 Define the concept *moisture front*. (1 x 2) (2)
- 1.3.2 (a) Identify the Ocean current around Indian ocean. (1 x 1) (1)
- (b) Explain the influence ocean current in QUESTION 1.3.2 (a) have on the air mass shown by arrows on the above sketch. (1 x 2) (2)
- 1.3.3 Describe the moisture content and density of air mass from Indian Ocean as shown with arrows in the sketch above. (2 x 2) (4)
- 1.3.4 With a paragraph of approximately SIX lines comment on why line thunderstorms generally occur in summer and not in winter. (3 x 2) (6)

1.4 Refer to the sketch below showing Urban Heat Island.



[Source: https://upload.wikimedia.org/wikipedia/commons/8/81/Urban_heat_island.svg]

- 1.4.1 Identify the highest temperature recorded on the sketch. (1 x 1) (1)
- 1.4.2 Explain why the urban areas are warmer than the surrounding areas. (1 x 2) (2)
- 1.4.3 Explain the impact of high-rise buildings on the high temperatures experienced in the CBD. (1 x 2) (2)
- 1.4.4 Distinguish between *Urban Heat Island* and *pollution dome*. (2 x 2) (4)
- 1.4.5 Discuss any THREE sustainable measures to put in place in order to reduce the urban heat island effects on South African cities. (3 x 2) (6)



1.5 Refer to extract on cold fronts.

Date: 10 June 2022

According to the South African Weather Service (SAWS), two cold fronts are expected to bring rain, strong winds, high waves and a significant drop in temperatures to South Africa.

The first cold front is expected to hit the Western Cape on Sunday evening 12 June. Ahead of this first cold front, strong north-westerly to westerly winds between 50–60 km/h, gusting up to 70–80 km/h, are expected over the southern parts of the Northern Cape and the interior of the Western and Eastern Cape from Sunday.

The second cold front is expected to reach the Western Cape by Monday evening 13 June, bringing continued high amounts of rainfall mainly to the south-western parts of the Western Cape, especially from Monday to Wednesday afternoon.

The wind direction associated with the cold front will change from north-west to south-west as the front moves over the Western Cape.

[Source: Adapted from [http://www.First cold front to hit Western Cape this weekend – 'heavy rainfall' to follow \(thesouthafrican.com\)](http://www.First cold front to hit Western Cape this weekend – 'heavy rainfall' to follow (thesouthafrican.com))]

- 1.5.1 In which season do the cold fronts mentioned in the extract above influence the Western Cape? (1 x 1) (1)
- 1.5.2 Give evidence from the extract to support your answer to QUESTION 1.5.1. (1 x 1) (1)
- 1.5.3 Why do cold fronts have a greater impact on the Western Cape during this season (answer to QUESTION 1.5.1)? (1 x 2) (2)
- 1.5.4 The change in wind direction mentioned in the extract above is known as veering/backing in the Southern Hemisphere. (1 x 1) (1)
- 1.5.5 Give a reason from the extract for your answer in QUESTION 1.5.4. (1 x 2) (2)
- 1.5.6 In a paragraph of approximately EIGHT lines, suggest positive and negative impacts of heavy rainfall associated with the cold fronts on the physical (natural) environment in the Western Cape. (4 x 2) (8)

[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 D.

Refer to the sketch below of the drainage basin to answer QUESTIONS 2.1.1 to 2.1.5.



[Source: Adapted from https://sageography.co.za/wiki/grade-12-caps/geomorphology/_drainage-systems-in-south-Africa/drainage-patterns/]

- 2.1.1 Dendritic patterns, which are by far the most common, develop in areas where ...

- A the rocks have a uniform/equal resistance to erosion.
- B igneous rock that has many joints.
- C the igneous rock has been affected by volcanic activity.
- D the rock beneath the stream has no particular structure.

- 2.1.2 The stream order at A is ... order.

- A 1st
- B 2nd
- C 3rd
- D 4th

2.1.3 The drainage density of the drainage basin is high because it is influenced by the river flowing in areas of ... and ...

- (i) less vegetation
- (ii) high porosity
- (iii) high rainfall
- (iv) high permeability

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

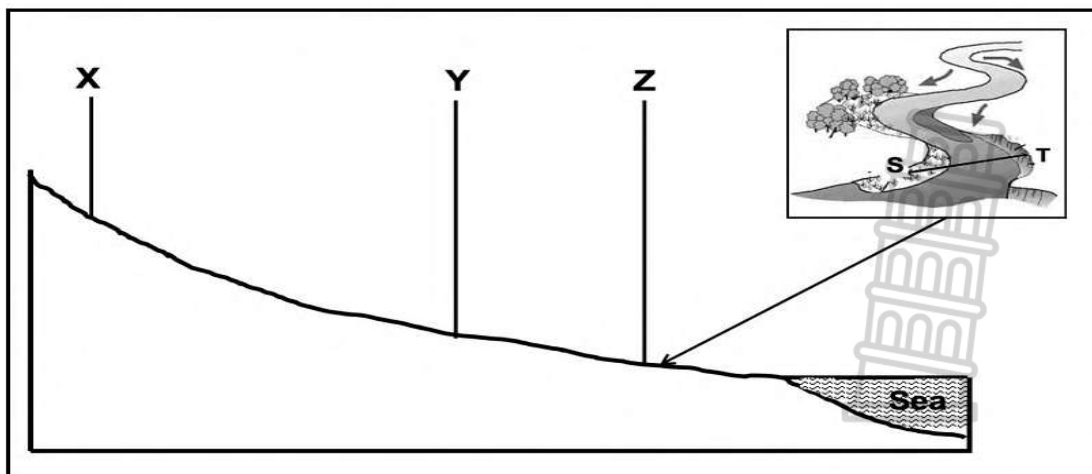
2.1.4 A point where two or more rivers meet is known as ...

- A catchment.
- B drainage basin.
- C river confluence.
- D surface run-off.

2.1.5 The region of higher land between two rivers that are in the same drainage system is a/an ...

- A watershed.
- B interfluve.
- C water table
- D source.

Refer to sketch below to answer question 2.1.6. to 2.1.8 Points **X**, **Y**, **Z** shows the different stages (courses) from the source to the mouth of a river and points **S – T** along the meander found at **Z**.



[Source: Examiner's own sketch]

2.1.6 The profile from the source to the mouth shows the ...of the river.

- A length
- B volume
- C width
- D depth

2.1.7 The stages (courses) represented by **X**, **Y** and **Z** are ...

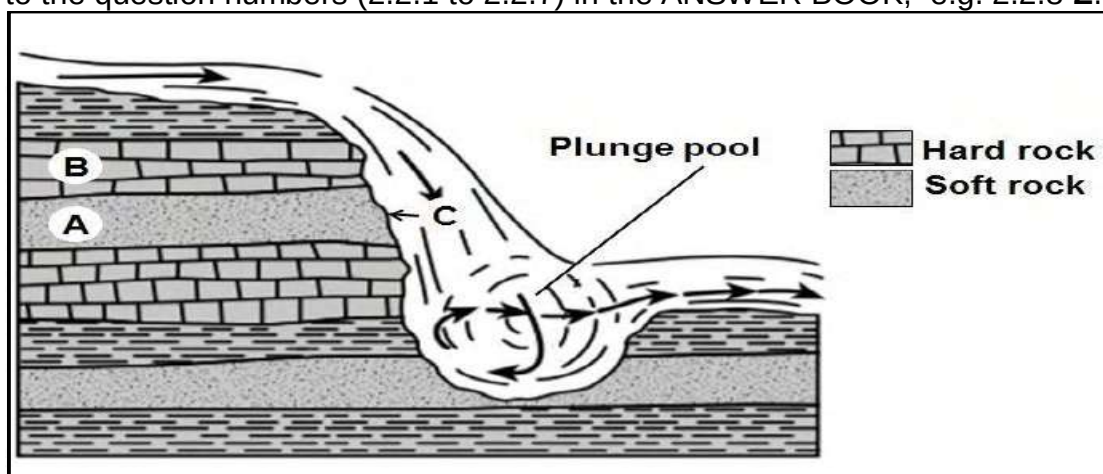
- A upper, middle, lower.
- B lower, middle, upper.
- C middle, upper, lower.
- C upper, lower, middle.

2.1.8 ... describes the river valley at **X**.

- A Narrow and deep
- B Wide and shallow
- C Narrow and shallow
- D Wide and deep

(8 x 1) (8)

2.2 Refer to the sketch below, which shows a waterfall with a plunge pool. Complete the statements in COLUMN A with the options in COLUMN B. Write only **X** or **Y** next to the question numbers (2.2.1 to 2.2.7) in the ANSWER BOOK, e.g. 2.2.8 Z.

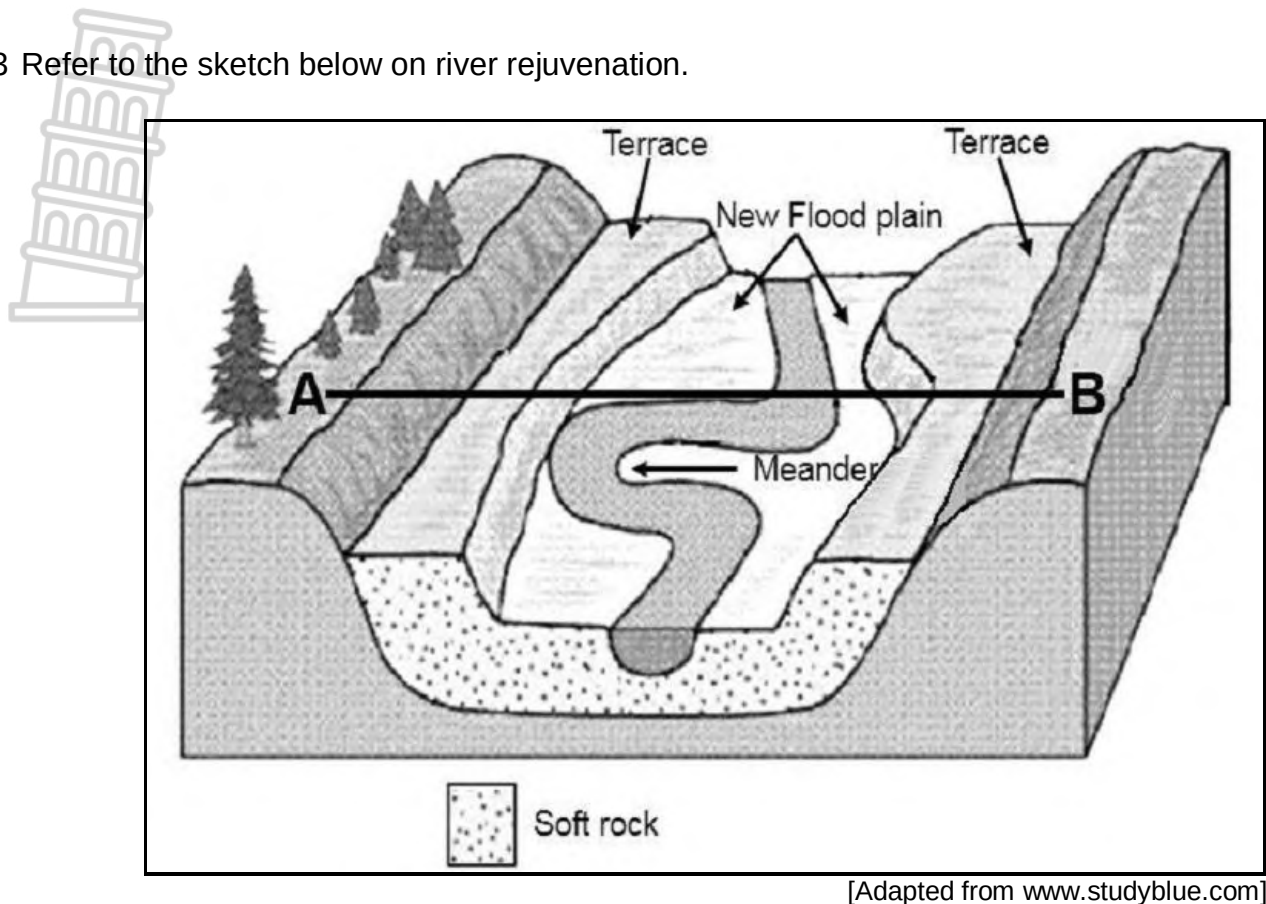


[Source: easyelimu.com]

COLUMN A	COLUMN B
2.2.1 Waterfalls are likely to be found in the ...	Y upper course Z lower course
2.2.2 ... refers to the softer rock that erodes faster.	Y Rock type A Z Rock type B
2.2.3 Waterfalls form when ...	Y there are alternate layers of hard and soft rock. Z there are only soft rocks.
2.2.4 Plunge pool is formed by ...	Y deposition Z erosion
2.2.5 The retreat of the waterfall will result in the formation of a ...	Y gorge Z rapid
2.2.6 An advantage of waterfall is ...	Y hydroelectricity. Z promoting water transport
2.2.7 When the softer rock at C erodes, it will cause ...	Y the rock at A collapsed into a plunge pool. Z waterfalls to retreat downstream.

(7 x 1) (7)

2.3 Refer to the sketch below on river rejuvenation.



2.3.1 Define the term *river rejuvenation*. (1 x 2) (2)

2.3.2 Explain how river capture relate to river rejuvenation. (1 x 2) (2)

2.3.3 Draw a labelled free-hand cross section from **A** to **B** of the illustrated river rejuvenation above.

Marks will be allocated for:

(a) Shape of the rejuvenated valley (1 x 1) (1)

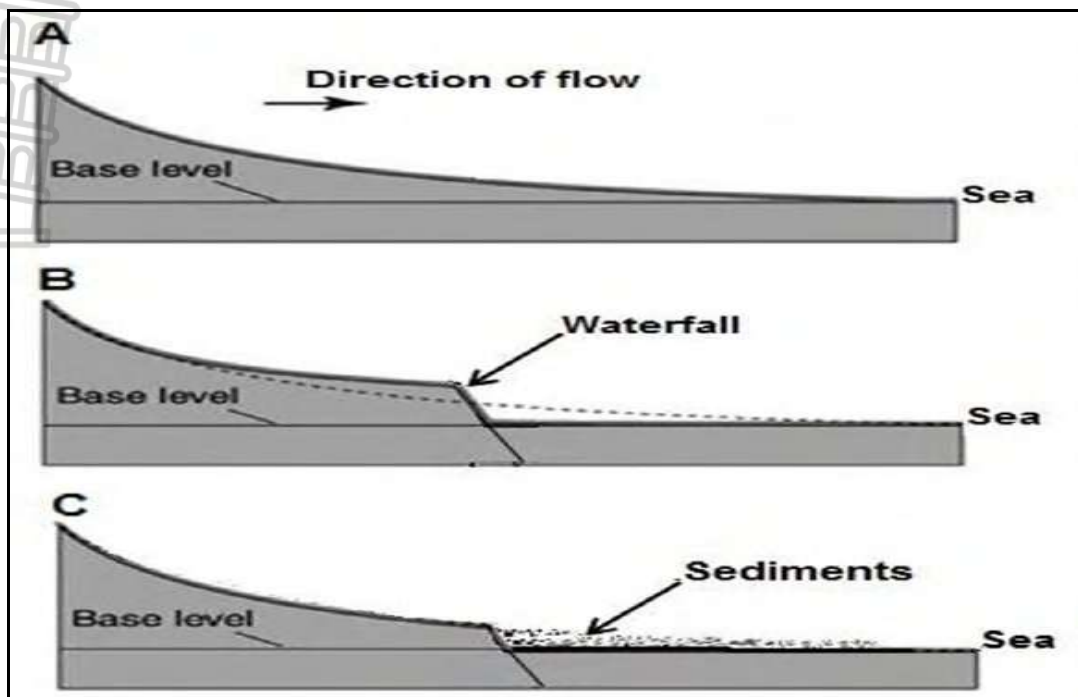
(b) Indicate the new flood plain (1 x 1) (1)

(c) Indicate the terraces (1 x 1) (1)

2.3.4 How did the river terraces (illustrated in the sketch above) form? (2 x 2) (4)

2.3.5 Explain how the illustrated landscape will negatively impact on infrastructure development. (2 x 2) (4)

2.4 The sketches **A**, **B** and **C** below are showing river profile and river grading.



[Adapted from: file:///T:/Fluvial%20Landforms]

- 2.4.1 Define the concept *longitudinal profile*. (1 x 2) (2)
- 2.4.2 State TWO characteristics of a longitudinal profile evident in sketch **A**. (2 x 1) (2)
- 2.4.3 Does sketch **A** represent a graded or an ungraded river? (1 x 1) (1)
- 2.4.4 Give a reason for your answer in QUESTION 2.4.3. (1 x 2) (2)
- 2.4.5 Identify a temporary and a permanent base level of erosion in sketch **B**. (2 x 1) (2)
- 2.4.6 Explain the processes that assisted the river in sketch **A** to have a steep gradient in the upper course and a gradual gradient in the lower course. (3 x 2) (6)

- 2.5 Refer to the picture and extract below on catchment and river management.

THE EFFECTS OF CHROME MINING ACTIVITIES ON THE WATER QUALITY OF HEX RIVER AND OLIFANTSNECK DAM



The Olifantsneck Dam is an arch type dam located on the Hex River near Rustenburg. The study was conducted to assess the water quality of Hex River downstream of Kroondal mine and effects of mining activities on the water quality. Potential pollutants were identified, quantified and their distribution was determined over seven years (2007-2013) along different sampling points upstream and downstream to the mine. Water quality-monitoring data was obtained from the mine.

The surface and underground water was sampled on a monthly basis and analysed by Aquatico, (a water quality service provider of Kroondal Chrome Mine) at SANAS Accredited Testing Laboratory.

Mining activities in Rustenburg negatively impact the water resources owing to poor management of mining waste, for example slimes, waste rock and overabundant exposure of mine over burdens or waste rock materials that contains sulphide-rich materials and sediments which are generated throughout the mine's lifespan with the potential to generate Acid Mine Drainage (AMD).

[Adapted from: Mavunda A. N., May 2016]

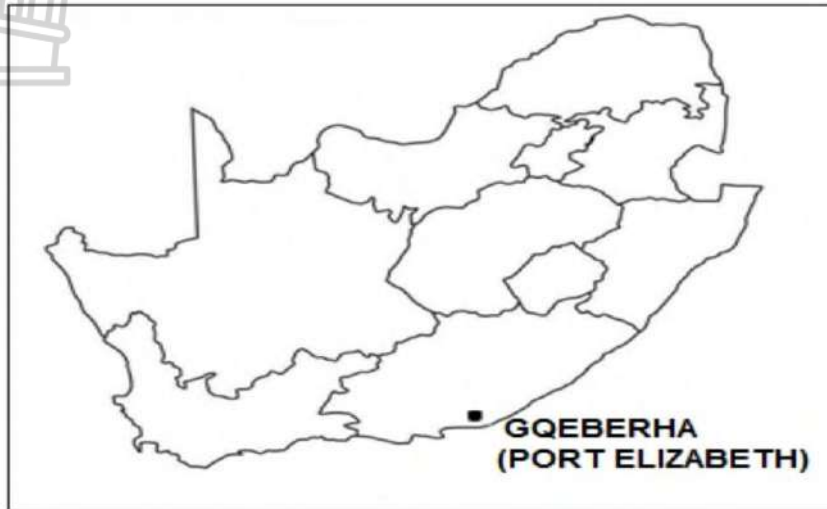
- 2.5.1 Define the term *river management*. (1 x 2) (2)
- 2.5.2 According to the extract above, what is Aquatico. (1 x 1) (1)
- 2.5.3 Why are water testing laboratories important? (1 x 2) (2)
- 2.5.4 Describe the negative impact that mining activities have on Hex River. (1 x 2) (2)
- 2.5.5 In a paragraph of approximately EIGHT lines, explain strategies that could be implemented so that the Hex River becomes a sustainable source of water. (4 x 2) (8)
- [60]

TOTAL SECTION A: 120

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON GQEBERHA (PORT ELIZABETH)



Coordinates : 33° 57'S; 25° 36'E

Gqeberha (Port Elizabeth) is a major seaport (harbour) and the densely populated city in the Eastern Cape in South Africa. It lies at Algoa Bay in the Indian Ocean.

The residential area is on a flat land, with an industrial sector at North End. Gqeberha is characterised by a large number of green belts.

The Coega Industrial Development Zone is located close to Gqeberha. It has a world class infrastructure which provides for the increased accessibility of services and industries to the rest of the world.

[Source: <http://www.google.com/search?qPorthElizebeth>]

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

ENGLISH

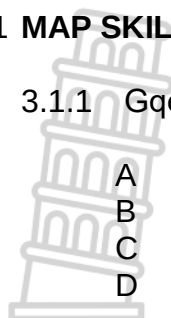
Diggings
River
Sewerage works
Estate
Salt pan
Nature reserve

AFRIKAANS

Uitgrawings
Rivier
Rooilwerke
Landgoed
Soutpan
Natuurreservaat

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 Gqeberha is situated in ... province



- A North West
- B Gauteng
- C Eastern Cape
- D Free State

(1 x 1) (1)

3.1.2 The distance of a landing strip from **6** to **7** on an orthophoto is ... metres

- A 1 400
- B 1 600
- C 1 800
- D 1 900

(1 x 1) (1)

3.1.3 Find the co-ordinates (grid reference) of the place of worship situated **Sidwell** in block **A3** on the topographical map.

- (a) $33^{\circ} 55'$... S
- (b) 25° ... $46''$ E

(2 x 1) (1)

3.1.4 Calculate the magnetic declination for 2024 following the given steps.

- (a) Difference in years
- (b) Mean annual change
- (c) Total change
- (d) Magnetic declination for 2024

(1)
(1)
(1)
(2) (5)

3.1.5 What is the purpose of calculating magnetic declination?

(1 x 1) (1)



3.2 MAP INTERPRETATION

Refer to the extended picture of Bakensriver and the topographical map.



[Adapted from en.m.wikipedia.org]

- 3.2.1 In which course/stage of a river is Bakensriver. (1 x 1) (1)
- 3.2.2 Substantiate your answer in Question 3.2.1 (1 x 2) (2)
- 3.2.3 Identify slope **A** and slope **B** from the above map of Bakensriver. (2 x 1) (2)
- 3.2.4 Will slope **A** be dominated by lateral erosion/deposition? (1 x 1) (1)
- 3.2.5 With a paragraph of approximately SIX lines, explain processes involved on the formation of slope **B**. (3 x 2) (6)

3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

Refer to Walmer Park in block **D1/D2** on the topographical map.

3.3.1 Define the term buffering. (1 x 2) (2)

3.3.2 Give evidence that buffering is taking place in block **D2**. (1 x 1) (1)

3.3.3 What is the purpose of buffering in this block? (1 x 2) (2)

3.3.4 Define the term data integration (1 x 2) (2)

3.3.5 Outline at least ONE type of data that has been utilised in making topographical map. (1 x 1) (1)

TOTAL SECTION B: 30

GRAND TOTAL: 150





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GRADE 12

GEOGRAPHY P1

JUNE 2024

MARKING GUIDELINES

POINTS: 150



These marking guidelines consist of 10 pages.

QUESTION 1: CLIMATE AND WEATHER

- 1.1 1.1.1 A
1.1.2 C
1.1.3 C
1.1.4 A
1.1.5 A
1.1.6 B
1.1.7 A
1.1.8 A (8 x 1) (8)

- 1.2 1.2.1 Z
1.2.2 Z
1.2.3 Z
1.2.4 Z
1.2.5 Y
1.2.6 Y
1.2.7 Z (7 x 1) (7)

1.3 Refer to the sketch below about line thunderstorms.

- 1.3.1 A boundary between two air masses with different moisture contents. (2)

- 1.3.2 (a) Warm Mozambique Current (1)

A candidate must specify that this is the warm Mozambique current.
No mark should be awarded for a candidate who wrote Only Mozambique stream

- (b) Warm. Mozambique Current is responsible for higher temperatures over the eastern half of South Africa (2)
The moist air over the Indian Ocean brings high rainfall to the eastern half of South Africa. (2) (1 x 2) (2)
[ANY ONE]

- 1.3.3 The air is warm and humid. (2)
The air is less dense because it is warm. (2) (2 x 2) (4)

1.3.4 In the summer

Low pressure system over the interior during the summer, draws moisture from the oceans to the land (2)
Inversion layer above escarpment in summer allows inflow of moist air (2)
Increased convergence of air masses from well-developed high pressure along the coast (2)
Weakened Kalahari High Pressure System facilitates greater vertical rise in the interior (2)
Presence of trough over the interior during the summer (2)



In the winter

Dominance of the Kalahari High Pressure System over the interior in winter results in strong influx of cold air (2)

Inversion layer under escarpment in winter prevents moist air from flowing into the central plateau (2)

Dry and cloudless conditions are experienced over the interior during the winter (2)

[ANY THREE, CANDIDATES MUST NAME BOTH SEASONS, WINTER AND SUMMER]

3 x 2)6)

1.4 1.4.1 35°C

No mark should be awarded for candidates who did not write °C.

[15]
(1)

1.4.2 This is due to the building materials (use examples) used in urban areas. (2)

This is due to infrastructure such as roads. (2)

This is due to lack of vegetation. (2) Due to high building density (2)

Due to tall buildings (2)

This is due to human activities in an urban area. **[ANY ONE]**

(2)

1.4.3 Heat trapped between buildings due to high building density (2) Tall buildings prevent wind from removing heat from the city (2)

Early in the morning/late afternoon, sun rays hit buildings at an angle of 90° and concentrate heat on the buildings (2)

Materials used to build tall buildings absorb more heat (2) More heat is trapped inside the buildings (2)

[EMPHASIS ON TALL

BUILDINGS] [ANY ONE]

(1 x 2) (2)

1.4.4 Urban heat island occurs during the day due to high temperatures, it has a larger vertical dimension and is not well defined (2) while pollution dome is strongly developed at night due to lower temperatures and falling air, it is well defined and compressed over the City. (2)

(2 x 2) (4)

1.4.5 Plant more trees in urban areas to absorb carbon dioxide. (2) Construction of rooftop gardens. (2) Use of white reflective paint or surfaces to prevent heat absorption. (2) Commercial decentralization to move shoppers/workers to remote areas. (2) Industrial decentralization to prevent pollution in cities. (2) Restrict industrial activities to daytime only. (2) Legislation to limit pollution. (2) Chimney stacks high enough to release smoke above the inversion layer. (2) Increase the number of water features. (2) Promote public transport to reduce the number of vehicles in the CBD. (2) Increase eco-friendly buildings. (2)

[ANY THREE]

(3 x 2) (6)

1.5 1.5.1 Winter

(1)

1.5.2 (10/12/13) June/ Date (1)

Cold fronts in the interior of the Western/Eastern Cape (1) High amounts of rainfall in the south-western part of SA (1)

Significant drop in temperature (1)

[ANY ONE] (1 x 1)

(1)

1.5.3 Northward movement of the high pressure belts (anti-cyclones) / ITCS (2)

(1 x 2) (2)

1.5.4 Shrinkage

(1)

1.5.5 The wind direction associated with the cold front will change from northwest to southwest as the front moves over the Western Cape.

1.5.6 **Positive:**

Brings much-needed moisture to the soil (2)

Biodiversity/ecosystem/habitat restoration (2) Water available for wildlife (2)

Water available for growth of natural vegetation (2)

Water provides for more pasture/veld (2)

Recharge (through infiltration) natural aquifers/springs/groundwater (2)

Recharge rivers (via surface runoff) (2)

Negative:

(Low-lying) areas will be flooded (2) Soil erosion will increase (2)

Destruction of biodiversity/ecosystem/habitat (2)

Damage to natural vegetation (2)

Loss of wildlife (2)

Increased salinization of rivers (2) Saturation of soil (waterlogged conditions) (2) Rockfalls/mass movements on steeper slopes (2)

[ANY FOUR, ANSWERS MUST REFER TO BOTH POSITIVE AND NEGATIVE]

(4 x 2) (8)
[60]

QUESTION 2 GEOMORPHOLOGY

2.1 2.1.1 A

2.1.2 C

2.1.3 B

2.1.4 C

2.1.5 B

2.1.6 A

2.1.7 A

2.1.8 A

(8 x 1) (8)

2.2 2.2.1 Y

2.2.2 Y

2.2.3 Y

2.2.4 Z

2.2.5 Y

2.2.6 Y

2.2.7 Y

(7 x 1) (7)

2.3 2.3.1 A process where a river recovers energy (and begins to erode vertically/ downwards again) (2)

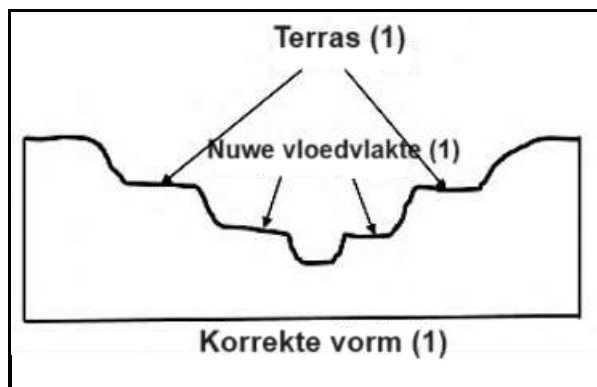
(1 x 2) (2)

2.3.2 After river capture, the stream recovers energy, therefore it undergoes rejuvenation. (2)
 Captor River will have high flow velocity and high erosion capacity. (2) The catchment stream will also experience an increase in the volume of water (2)

ANY ONE

(2)

2.3.3



Point distribution

Mark for correct shape of cross section (1)

Mark for indicating new floodplain on cross section (1) Mark for indicating ANY ONE Terrace on cross section (1) (3 x 1)

(3)

2.3.4 A rejuvenated river cuts into the valley floor (2)

Cut-off creates a new floodplain (2)

A tree-like shape between the old and new floodplains (2)

[ANY TWO]

(2 x 2) (4)

2.3.5 Steepness of slopes will hinder construction of roads/railways (2) Softness of the underlying rocks causes instability of roads/railway construction (2)

Terraces make it expensive to build bridges (2)

Wide floodplains make it difficult to build bridges (2)

[ANY TWO]

(2 x 2) (4)

INSTRUCTIONS FOR PARTIAL MARKING - MAXIMUM OF TWO

Steepness of slopes (1)

Softness of the underlying rocks (1)

Terraces (1)

Wide floodplain (1)

2.4 2.4.1 Side view of a river from source to mouth. (2)

(1 x 2) (2)

2.4.2 Smooth/graded (1)

Concave shape (1)

Steeper in the high-lying area (1)

Gentle in the low-lying area (1)

(Accept) It has only permanent base level (1)

(Accept) No temporary base levels/waterfall (1) **[ANY TWO]**

(2 x 1) (2)

2.4.3 Graded (1) (1 x 1)

(1)

2.4.4 Temporary base planes not clear (2) It
has a smooth concave profile (2)

[ANY ONE]

(1 x 2) (2)

2.4.5 Temporary base level: waterfall (1)

Permanent base level: sea (1)

(2 x 1) (2)

2.4.6 **Processes that create the steep slope in the upper course** Backward
erosion of kinks will increase the steepness of the slope (2)

Downward erosion creates a steep slope (2)

In the upper course, water flow is mostly turbulent (2) The

current has enough energy to carry larger particles (2) Larger

particles increase downward erosion (2)

Processes that create the gradual gradient in the lower course

Lateral erosion will result in a more gradual gradient (2) Sediments

are deposited in the lower course (2)

In the lower course, water flow is laminar (2)

The carrying capacity is reduced due to the wider river channels (2) This

increases the friction on a river bed and sides and slows down water flow

leading to greater deposition rates (2)

**[ANY THREE. MUST REFER TO BOTH QUIET GRADIENT AND
GRADUAL GRADIENT]**

[ANY THREE]

(3 x 2) (6)

2.5 2.5.1 The management of water resources (2) (1 x 2) (2)

2.5.2 A water quality service provider from Kroondal Chrome Mine. (2) (1 x 1) (1)

2.5.3 Monitor the water quality (2) (accept examples)

Identify the origin of the water pollution (2) Check the level of water pollution (2)

Ensure that the ecosystem remains healthy (2)

Ensure that the ecosystem remains in balance (2)

Preserve biodiversity (2)

To conduct ongoing research and predictions (2) To ensure that water is safe for people to use (2) To assist in proper water management (2)

To prevent people from getting (waterborne) diseases (2) (accept examples)

[ANY ONE] (1 x 2) (2)

2.5.4 Pollution due to infiltration of groundwater (2) Reduces the demand for water quality. (2)

Due to mining activities, water pollution has become a serious risk to aquatic life (2)

The shared sources of water pollution are drainage from mines, industrial effluents and domestic sewage (2)

The natural weathering of rocks – which provides a significant amount of toxic elements and compounds to surface and groundwater (2)

Dust from open-pit mining has a negative impact on the water quality of Hex River (2) (1 x 2) (2)

2.5.5 Reduce the use of pesticides/herbicides (2) Buffer the Hex River catchment area (2)

Practice green agriculture (accept examples) (2)

Close the mines along the banks (2)

Manage industrial waste dumping (accept examples) (2)

Reduce deforestation (2)

Reduce pollution of (ground)water (2) Implement

legislation (accept examples) (2) Provide

incentives (accept examples) (2) Create awareness

(accept examples) (2) Implement wastewater treatment (2)

Ensure stormwater management (2)

Ensure wetland conservation (2)

Proper land use planning (accept examples) (2) Regular testing (accept examples) (2)

Improve infrastructure in informal settlements (accept examples) (2)

Maintain water purification plants (2)

Regular environmental impact assessments (2)

Afforestation / Restore the floodplain/riparian zone (2) [ANY FOUR]

(4 x 2) (8)

TOTAL SECTION A:

**[60]
120**

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 C (1) (1)
3.1.2 A (1) (1)

3.1.3 3.1.3 (a) $33^{\circ} 55' \underline{06''}$ (1) S Candidates must include "(seconds)
3.1.3 (b) $25^{\circ} \underline{35}' 46''$ (1) O Candidates must include "(minutes) (2 x 1) (2)

3.1.4 Calculate the magnetic declination for 2024 by following the given steps.

a) Difference in years: 2024-2021	= 3 years (1)	(1)
b) Average annual change:	12' W (1)	(1)
c) Total change: 3 yr x 12'W	= 36'W (1)	(1)
d) Magnetic declination for 2024:	29° 00' W	
	+ (1) 36'W	(1)
	29° 36' West of True North (1)	(1)

3.1.5 To determine the position of true north(1) (1)
[10]



3.2 3.2.1 Undertrack (1) / old stage (1)

(1 x 1) (1)

3.2.2 There is evidence of meandering (2)

The mouth of a river shows that it is in its lower course (2)

Evidence of floodplains around the river (2)

The slope is gently gradual (2)

ANY ONE

(1 x 2) (2)

3.2.3A- Slipping down the slope (1)

B- undercut slope (1)

(2 x 1) (2)

3.2.4 Deposition (1)

(1 x 1) (1)

3.2.5 This is the undercut slope associated with fast-flowing water (2)

A lot of energy leading to the process of lateral erosion (2)

It occurs on the outer bank of the meander (2) The slope

is steep and concave (2)

[ANY THREE]

(3 x 2) (6)
[12]



3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

3.3.1 Demarcation of an area around the spatial feature.

(1 x 2) (2)

3.3.2 Provide evidence that buffering occurs in block D2.

Bushveld (1)

Golf course (1)

Fire track (1)

Bankens River Valley (1)

Row of trees (1)

Open space (1)

[ANY ONE]

(1 x 1) (1)

3.3.3 Reduce air/noise and water pollution (2) Reduce flooding (2)

Limit development along streams (2)

Protect river from soil erosion (2)

Control fire from spreading (2)

Reduce expansion of residential development (2) [ANY ONE]

(1 x 2) (2)

3.3.4 Data integration is a process of combining different types of data on a single map. to combine (2)

(1 x 2) (2)

3.3.5 Satellite (1)

Aerial photos (1)

Digital maps (1)

Digital data (1)

Table information (1)

[ANY ONE]

(1 x 1) (1)
[8]

TOTAL SECTION B: 30
GRAND TOTAL: 150