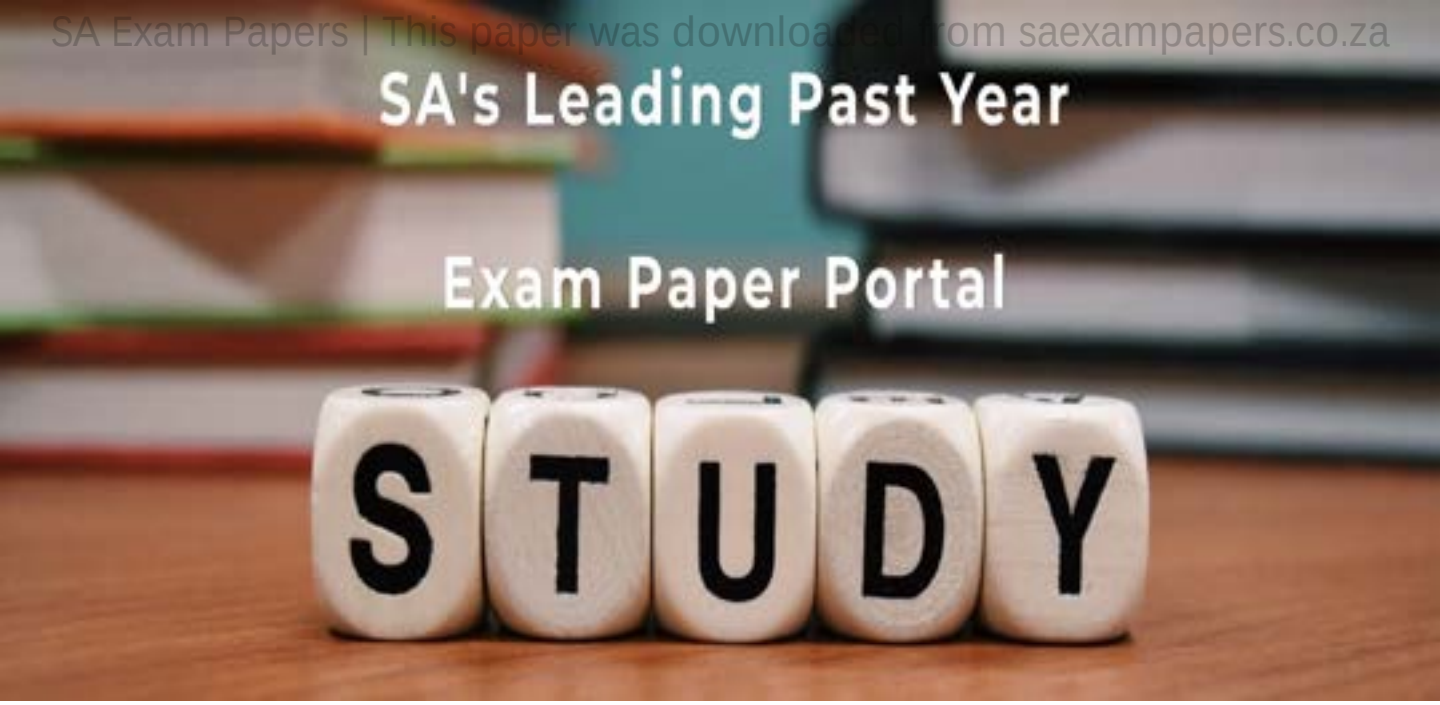


GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

# PREPARATORY EXAMINATION

# 2023

# MARKING GUIDELINES

**GEOGRAPHY (PAPER 1) (10781)**

**17 pages**

## MARKING PRINCIPLES FOR GEOGRAPHY – 2023

The following marking principles are developed to standardise marking processes.

### 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 for which a mark is being allocated.
  - Ticks must be kept SMALL, as various layers of moderation may take place.
- Incorrect answers must be marked with a clear, neat cross: **X**
  - Use MORE than one cross across a paragraph/discussion style question to indicate that all facts have been considered.
  - Do NOT draw a line through an incorrect answer.
  - Do NOT underline the incorrect facts.

### 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.

### TOTALLING AND TRANSFERRING OF MARKS

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

### MODERATION

Marking on each level of moderation is done in the same way as the initial marking. All guidelines for marking must be adhered to.

If a mark for a subquestion is changed after moderation, the moderator must strike through the marker's mark and write down the new mark, ~~12~~ 16

The total for the question must be re-calculated, and similarly be struck off and the new total must be written down as follows, ~~26~~ 36

**EXAMPLE FOR MARKING**

**QUESTION 1** 22

1.1 1.1.1 A (South Atlantic High) ✓

1.1.2 B (Kalahari High) ✓

1.1.3 B (South Indian) X 2

1.2 1.2.1 Melting snow ✓

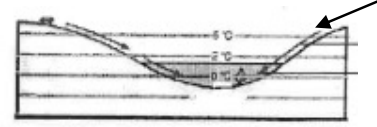
1.2.2 Mouth X

1.2.3 Third order ✓ 2

1.3 1.3.1 Katabatic X

1.3.2 1 occurs during the day while 2 occurs at night ✓✓

1.3.3 Cold air rolls down into the valley and forms an inversion ✓✓
Air flows downslope ✓✓



6

1.4 1.4.1 Shape of front concave X
Steep gradient of front ✓

1.4.2 Warm air undercuts the cold air X

1.4.3 Air behind the cold front ✓✓ is colder than the air in front. Cold air moves faster than warm air ahead of it. ✓✓ Cold front catches up with the warm front. 5

1.5 1.5.1 (a) A river that only flows all year-round X
(b) The river channel is wide X ✓✓
(c) Regularity of rainfall ✓ and the soil type X over which the streams flow. ✓✓

1.5.2 Gauteng and the Eastern Cape

1.5.3 The cost of food production will increase as it is costly to buy purified water. ✓✓ Farmers will have to buy more chemicals to purify water. Chemicals cost a lot, and this will increase production costs. It will be costly to purify water for use in electricity generation. M These costs will be in electricity prices. Costs will increase the price of electricity during production. There will be less clean water to generate hydroelectricity. 7

**SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY**

**QUESTION 1: CLIMATE AND WEATHER**

1.1.1 Z(1)/shadow zone

1.1.2 Z(1)/terrestrial

1.1.3 Z(1)/frost

1.1.4 Y(1)/north

1.1.5 Z(1)/thermal belt

1.1.6 Y(1)/south

1.1.7 Y(1)/zone of incidence (7 x 1) (7)

1.2 1.2.1 C (1)/Kalahari anticyclone

1.2.2 B (1)/anticlockwise

1.2.3 A (1)/ridge

1.2.4 A (1)/polar high pressure and subpolar low pressure

1.2.5 C (1)/(ii) and (iii)/winter and frontal

1.2.6 C (1)/cold and rainy

1.2.7 D (1)/dry conditions with clear skies

1.2.8 B (1)/(i) and (iv)/lower and west to east

(8 x 1) (8)

1.3 Refer to the infographic on Tropical Cyclone Gombe below.

1.3.1 How many tropical cyclones have occurred before Tropical Cyclone Gombe?

***Six (1)*** (1 x 1) (1)

1.3.2 According to the infographic, what is the scientific evidence fuelling the intensity of tropical cyclones in the Indian Ocean?

***Climate change (1)***
***Warming of the Indian Ocean (1)***
***[Any ONE]*** (1 x 1) (1)

1.3.3 Provide evidence from the satellite image that suggests that Tropical Cyclone Gombe has reached the stage of maturity.

***Presence of an eye (1)*** (1 x 1) (1)

1.3.4 Discuss why Tropical Cyclone Gombe will decrease in intensity once it reaches the coastline of Mozambique.

***Frictional drag occurs when the cyclone reaches land. (2)***
***Loss of source of moisture once the cyclone is overland. (2)***
***Less latent heat will be available. (2)***
***Atmospheric pressure will increase. (2)***
***[ANY TWO]*** (2 x 2) (4)

1.3.5 Explain TWO weather elements of Tropical Cyclone Gombe, indicated in the infographic, that may have resulted in the damage caused to the infrastructure.

***Strong winds will damage the electricity poles. (2)***
***Strong winds will blow off the roofs of houses and buildings. (2)***
***Torrential/Heavy rain will flood the buildings. (2)***
***Heavy rain will result in flooding that will cause damage to buildings. (2)***
***Heavy rain and flooding will result in short circuits in electricity. (2)***
***Flooding will result in erosion of tarred roads. (2)***
***Heavy run-off will flood the sewage systems and damage the water pipes. (2)***
***Lightning can damage electricity poles (can give examples of infrastructure) (2)***
***Lightning can cause firesthat damage the infrastructure (2)***
***Hail can damage buildings (can give examples of infrastructure) (2)***

***[Any TWO – MUST refer to TWO different weather elements.]***

(2 x 2) (4)

1.3.6 Suggest TWO precautionary strategies that can be implemented in this area to reduce the possible damage caused to the infrastructure during tropical cyclones by flooding, as mentioned in the article.

***Use stronger building materials to build homes. (2)***
***Avoid construction in low-lying areas (floodplains). (2)***
***Maintain/Repair roads for easy evacuation. (2)***
***Maintain water systems to reduce damage. (2)***
***Construct better roads that can withstand heavy rains. (2)***
***Construct clinics and schools on areas not prone to flooding. (2)***
***Improve construction and maintenance of basic (electricity) infrastructure. (2)***
***Sandbags/barriers to prevent flooding (2)***
***[Any TWO]*** (2 x 2) (4)

**[15]**

1.4 Study the information below.

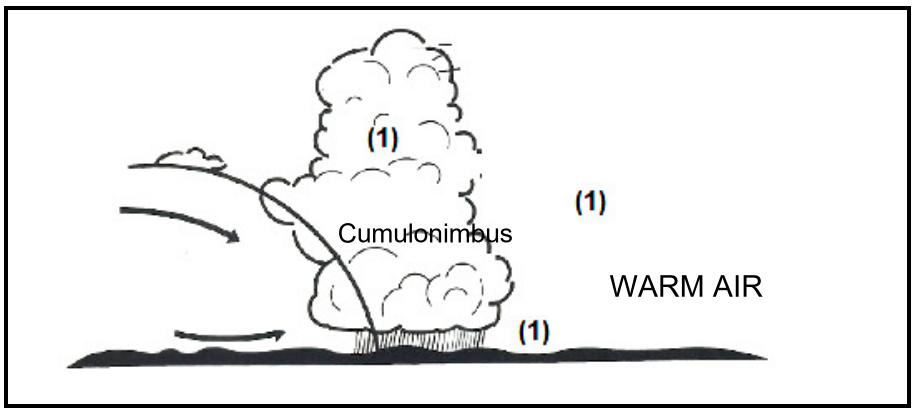
1.4.1 Identify the weather system shown on the diagram, of which the cold front forms a part.

***Midlatitude cyclone/frontal depressions/temperate cyclones/extra-tropicaly cyclone (1)*** (1 x 1) (1)

1.4.2 What is the main reason why these weather systems are more prevalent (common) over Cape Town during winter, as shown in the article?

***Pressure systems follow the latitudinal position of the sun. (2)***
***In winter the pressure ~~system~~ cells moves north which moves the midlatitude cyclones further north. (2)***
***[Any ONE]*** (1 x 2) (2)

1.4.3 Draw a labelled, free-hand cross section through the cold front indicated as **A** on the diagram. Indicate the weather elements preceding the cold front on the cross section diagram.




***Mark allocation:***
***1 mark for indication of cumulonimbus clouds***
***1 mark for indication of precipitation***
***1 mark for indication of warm air/temperature*** (3 x 1) (3)

1.4.4 Identify the type of cloud that will develop at **B** on the diagram.

***Cumulonimbus (1)*** (1 x 1) (1)

1.4.5 Explain how the weather system identified in QUESTION 1.4.1 resulted in the development of clouds at **B**.

***Fast moving cold air rapidly uplifts warm air ahead of it. (2)***
***Warm air cools down rapidly because of adiabatic heating (1 °C/100 m). (2)***
***High level of condensation takes place and cumulonimbus clouds develop. (2)***
***[Any TWO]*** (2 x 2) (4)

1.4.6 Predict the impact of the weather elements of this weather system on farming as it passes over the Western Cape.

***<u>NEGATIVE:</u>***
***Very cold temperatures may damage crops/kill livestock. (2)***
***Snowfall may damage crops/kill livestock. (2)***
***Floods may destroy livestock and crops. (2)***
***Soil erosion may take place when soil is washed away by floods. (2)***
***Heavy rainfall may make it difficult to work in the fields. (2)***
***Strong winds will damage crops (2)***
***Strong winds can erode fertile soil (2)***
***Hail can damage crops/livestock (2)***
***Flooding can damage agricultural infrastructure (2)***

***<u>POSITIVE:</u>***
***Increased rainfall results in availability of water for farming (2)***
***Cold temeperatures can kill pests (2)***
***Lower temperatures can be an advantage for certain winter crops (2)***

***[Any TWO. Can refer to either positive or negative impact.]*** (2 x 2) (4)
**[15]**

1.5 Refer to the infographic below on urban heat islands.

1.5.1 What is the temperature over the central business district in the temperature profile diagram?

***23 °C (1)*** (1 x 1) (1)

1.5.2 According to the article, why will an urban heat island develop at **A** rather than **C**?

***More pavements at A (city) compared to rural areas at C (2)***
***More buildings concentrated in one area at A(city) than in rural areas C (2)***
***Lack of greenery in the city (A) compared to more vegetation in the rural areas (C) (2)***
***[Any ONE]*** **(1 x 2)** (2)

1.5.3 Give ONE reason for the lower temperatures experienced over the park area at **B.**

***Less concrete surfaces that will absorb and release heat (2)***
***Vegetation absorbs heat/carbon dioxide and lowers temperature***
***Evapotranspiration lowers temperature (2)***
***Vegetation releases oxygen (cooling agent) which lowers heat (2)***
***Vegetation/Parks allows free movement of air that will reduce heat (2)***
***Vegetation provides shade which lowers temperatures (2)***
***[Any ONE]*** (1 x 2) (2)

1.5.4 Refer to the temperature graph and give a reason why the temperature of the urban heat island is lower at night than during the day.

***More activities during the day result in higher temperature (can give examples) (2)***
***Less activities during the night result in lower temperature (can give examples) (2)***
***During the day higher heat absorption by urban surfaces (2)***
***Less insolation at night and more insolation during the day (2)***
***A lower/higher albedo will result in a temperature difference (2)***
***More terrestrial radiation at night will lower temperature (2)***

***[Any ONE]*** (1 x 2) (2)

1.5.5 Explain in a paragraph of approximately EIGHT lines how the development of features using natural materials in cities can be used to reduce the urban heat island effect.

***Develop more parks/natural vegetation that will absorb heat. (2)***
***More vegetation(parks) will reduce the temperature through transpiration. (2)***
***Introduce roof gardens to reduce the temperature through transpiration. (2)***
***Open water surfaces will absorb the heat and reduce the temperature. (2) (Can give examples)***
***Evaporation of water will reduce the temperature. (2)***
***The use of thatched roofs instead of tiles or zinc will reduce the absorption and release of heat. (2)***
***Use of natural building materials in construction. (Can give examples) (2)***
***[Any FOUR. Must refer to natural features in the answer]*** (4 x 2) (8)

**[15]**
**[60]**

**QUESTION 2: GEOMORPHOLOGY**

2.1 2.1.1 ***C (1)/plunge pool.***

2.1.2 ***C (1)/ deposition of sediments on the banks of the river.***

2.1.3 ***D (1)/(i) and (iv)/lower course and high***

2.1.4 ***A (1)/increased deposition.***

2.1.5 ***B (1)/Meander***

2.1.6 ***D (1)/oxbow lake.***

2.1.7 ***A (1)/plain that forms at the mouth of a river caused by deposition.***

(7 x 1) (7)

2.2 2.2.1 ***captor stream (1)***

2.2.2 ***Headward erosion (1)***

2.2.3 ***small (1)***

2.2.4 ***90 degree (1)***

2.2.5 ***wind gap (1)***

2.2.6 ***isostatic uplift (1)***

2.2.7 ***increase (1)***

2.2.8 ***smaller (1)***

(8 x 1) (8)

2.3 Study the following diagrams on the process of river rejuvenation.

2.3.1 Choose the correct option in brackets.

River rejuvenation is when the erosive power of a river increases resulting in an increase of (lateral deposition/vertical erosion).

***vertical erosion (1)*** (1 x 1) (1)

2.3.2 Determine the cause of river rejuvenation as shown in the diagram above.

***Sea level drops/A drop in sea level (1)*** (1 x 1) (1)

2.3.3 Explain how river rejuvenation results in the formation of river terraces at **A**.

***Increased vertical erosion (2)***
***Results in a deeper valley on the flood plain. (2)*** (2 x 2) (4)

2.3.4 Identify the landform at **B** associated with river rejuvenation.

***Knickpoint waterfall / Knickpoint / Waterfall (1)*** (1 x 1) (1)

2.3.5 Describe how erosion causes landform **B** to retreat (move) upstream over time.

***Headward erosion will occur causing the position of the waterfall to move upstream. (2)***
***Undercutting at the base of the waterfall will occur resulting in the position of the waterfall to move upstream. (2)***
***The plunge pool will deepen causing the cliff to collapse causing the waterfall to move upstream. (2)***
***[Any TWO]*** (2 x 2) (4)

2.3.6 Predict how the narrowing of the original floodplain will negatively impact agricultural activities.

***Flood plain will be narrowed therefore less land available for farming. (2)***
***Yield is reduced because smaller areas can be cultivated. (2)***
***Difficulty in building of roads to transport agricultural products. (2)***
***Difficult to access water from higher ground. (2)***
***[Any TWO]*** (2 x 2) (4)
**[15]**

2.4 Study the diagram below that shows the fluvial courses of a river.

2.4.1 Would the flow in the upper course of the river be characterised as turbulent or laminar?

***turbulent (1)*** (1 x 1) (1)

2.4.2 Provide evidence from the diagram to substantiate your answer to QUESTION 2.4.1.

***Steep gradient results in turbulent flow (2)***
***River valley is narrow and steep (2)***
***River channel in upper course uneven (2)***
***[Any ONE]*** (1 x 2) (2)

2.4.3 Define the term *cross (transverse) profile*.

***A cross view of a river from one bank to the opposite bank. (2)***
***[CONCEPT]*** (1 x 2) (2)

2.4.4 Refer to the middle and lower courses of the river.

(a) Which of the following cross-profiles represents the middle and lower courses respectively?

***Middle – C (1)***
***Lower – A (1)*** (2 x 1) (2)

(b) Describe the shape of the river valley in the middle and lower courses.

***Middle course – U-shaped (1)***
***Lower course – Open/Wider U-shaped (1)*** (2 x 1) (2)

2.4.5 Explain how fluvial processes throughout the river course result in the formation of the valley shape of the lower course described in QUESTION 2.4.4(b).

***The process of erosion (vertical in the upper course and lateral in the middle course) creates sediment. (2)***
***Eroded sediments are transported from the upper and middle course to the lower course. (2)***
***The river volume and speed decreases in the lower course and results in deposition. (2)***
***Transported sediments are then deposited on the riverbed in the lower course which reduces the depth of the valley. (2)***
***[Any THREE]*** (3 x 2) (6)

**[15]**

2.5 Study the information below on river management.

2.5.1 Define the term *catchment management*. (note – river vs catchment management)

***Catchment management is balancing the use and conservation of natural resources in a cachment area. (2) [CONCEPT]***

***River management is balancing the use and conservation of natural resources in a cachment area. (2) [CONCEPT]***

****Accept the definition of river management and river catchment management because of question phrasing.***

(1 x 2) (2)

2.5.2 Identify the human contribution to the flooding in Durban from the article.

***Planting of alien invader plants/vegetation (1)***
***Litter/land pollution (1)*** (2 x 1) (2)

2.5.3 Use evidence from the pie graph to explain why the eThekwini Municipality has found it challenging to maintain catchment areas.

***The eThekwini Municipality only owns 23% of Durban's rivers. (1)***

(1 x 1) (1)

2.5.4 Why is the maintenance of catchment areas financially important for the eThekwini Municipality?

***A well-maintained catchment area results in R4 billion revenue for the municipality every year. (2)*** (1 x 2) (2)

2.5.5 In a paragraph of approximately EIGHT lines, propose FOUR ways in which the eThekwini Municipality can ensure that residents of Durban can be encouraged to assist in catchment management.

***Encourage residents to create buffer zones close to rivers. (2)***
***Encourage the planting of trees/vegetation. (2)***
***Encourage the conservation of wetlands. (2)***
***Encourage recycling of waste as an alternative to dumping in rivers. (2)***
***Awareness campaigns about catchment management (accept examples). (2)***
***Educate residents on sustainable practices. (2)***
***Impose fines for polluting. (2)***
***Co-operation between different owners of rivers. (2)***
***Provision of bins for waste disposal. (2)***
***[Any FOUR]*** (4 x 2) (8)

**[15]**
**[60]**

**TOTAL SECTION A: 120**

## SECTION B

## QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

### 3.1 MAP SKILLS AND CALCULATIONS

Refer to the topographic map.

3.1.1 The altitude of the reservoir located at **F** in block **A5** on the topographic map is … metres.

***D (1)/780*** (1 x 1) (1)

3.1.2 The feature located at 33°11'38"S; 20°51'04"E on the topographic map is a …

***B (1)/Hospital.*** (1 x 1) (1)

3.1.3 Calculate the length of the bridge on the national road in block C2 on the topographic map in metres (m).
Formula: Actual Distance = Map distance x Map scale

***Formula: Actual Distance = Map distance x Map scale***
***= 0,4 (1) cm x 500 m Range (0,3 – 0,5)***
***200 m (1) Range (150 – 250 m)***

***Assess skill of calculating distance using Learner measurement.***
***(Unclear map)*** (2 x 1) (2)

Refer to the orthophoto map.

3.1.4 Calculate the average gradient along the white line between trigonometrical station **103** (block **D2**) and point **6** (block **D3**) on the orthophoto map extract in meter.
The Vertical Interval (VI): 731,5 m – 650 m = 80,5 m / **81.5 m**

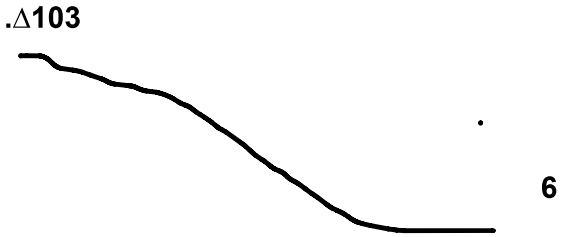
**Average Gradient = Vertical Interval (VI) / Horizontal Equivalent(HE)**

81.5 m
**80.5 m**
**4.1(1) cm x 100 m = 410 m(1) Range: (4 – 4.2 cm)**

81.5 m
***80.5 m / 410 m*** **(1)** ***Range: (400m – 420m)***

***= 1 : 5,09 (1)*** ***Range (4.96 – 5,21)*** (4 x 1) (4)
1:5.03
Range: 4.90 – 5.15

3.1.5 Draw a free hand cross section of the slope between trigonometrical station **103** (block **D2**) and point **6** (block **D3**) on the orthophoto map extract.




***1 mark for correct shape (1)*** (1 x 1) (1)

3.1.6 Identify the slope of the cross section drawn in QUESTION 3.1.5.

***It is a convex slope (1)*** (1 x 1) (1)

**[10]**

## 3.2 MAP INTERPRETATION

Refer to the settlement Goldnerville in block **C4** on the topographic map.

3.2.1 (a) Goldnerville experiences frost pockets during the night because of its … location.

***A (1)/*valley** (1 x 1) (1)

(b) The wind that develops at night in block **C4** is a/an (anabatic/ katabatic) wind.

***Katabatic (1)*** (1 x 1) (1)

(c) How would the steep slope north of Laingsburg impact the wind identified in QUESTION 3.2.1 (b)?

***It will be stronger/faster. (1)***
***Gravitational pull (1)***
***Downward movement (1)***
***[Any ONE]*** (1 x 1) (1)

Refer to the area indicated with black dots in block **B5** of the topographic map.

3.2.2 (a) Identify the predominant drainage pattern of the area indicated as **H** in block **B5** on the topographic map.

***Parallel (1)*** (1 x 1) (1)

(b) Describe the underlying rock structure that is responsible for the drainage pattern identified in QUESTION 3.2.2(a).

***Uniform rock structure (2)***
***Resistant rock structure (2)***
***Develops on hills and ridges (2)***
***(Accept steep slopes) (2)***
**[Any ONE]** (1 x 2) (2)

Refer to the area indicated as **J** in blocks **B1** and **B2** and **A1** and **A2** on the topographic map.

3.2.3 (a) Calculate the stream order of the river at **J** in block **B1**.

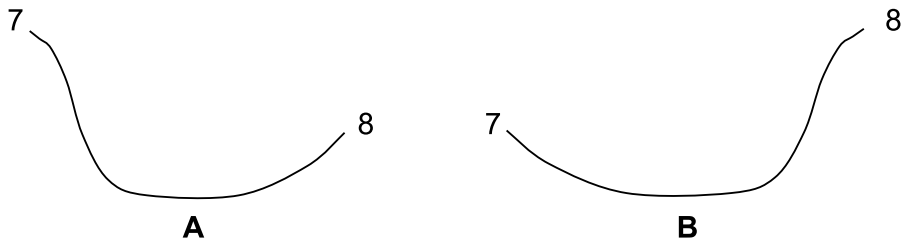
***3rd order (1)*** (1 x 1) (1)

(b) Explain how the number of 1st order streams in the area indicated by **J**, is evidence of a dendritic drainage pattern.

***There must be many 1st order streams that will result in the development of 2nd order and then 3rd order streams. (2)*** (1 x 2) (2)

Refer to the white line **7** – **8** on the orthophoto map in block **A1**.

3.2.4 (a) Which of the following diagrams represents a cross section from point **7** to point **8** on the orthophoto map?



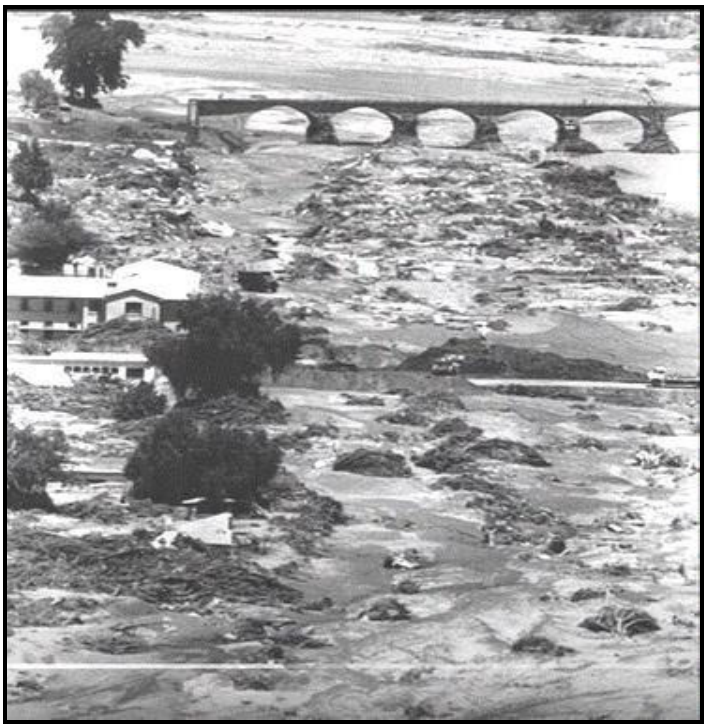

***A (1)*** (1 x 1) (1)

(b) Identify the fluvial slope elements at **7** and **8** respectively.

***7 – Cut-off slope / Undercut slope / River cliff (1)***
***8 – Slip-off slope (1)*** (2 x 1) (2)
**[12]**

## 3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Laingsburg was partially destroyed within minutes in a flash flood after a cloudburst in 1981. Refer to the following image of the railway bridge and block **C3** on the topographic map.



[Source: https://www.laingsburg.gov.za/laingsburg-flood-1981-0]

3.3.1 The image above is classified as a … map.

***C (1)/oblique photo*** (1 x 1) (1)

3.3.2 (a) Can the photo above be identified as a low or high-resolution photograph?

***High (1)*** (1 x 1) (1)

(b) Explain your answer in QUESTION 3.3.2 (a).

***Image is clear and not blurred. (2)*** (1 x 2) (2)

3.3.3 (a) Define the term *buffering*.

***An area that surrounds one or more map features used to indicate boundaries around a specific feature. (2) [CONCEPT]***

(1 x 2) (2)

(b) Give evidence from the topographic map that buffering was implemented after the 1981 flood as a strategy to prevent the same scale of damage during future flooding.

***The golf course and recreational areas were built (on the floodplain to prevent development of houses). (2)***
***Cultivated land located on the floodplain (2)***
***Open space/trees between river and houses (2)***
**[Any ONE]** (1 x 2) (2)

**[8]**

**TOTAL SECTION B: [30]**

**TOTAL: 150**