METRO CENTRAL EDUCATION DISTRICT

COMMON TRIAL EXAM

GRADE 12

GEOGRAPHY PAPER 1

29 AUGUST 2025

MARKS: 150

TIME: 3 hours

This paper consists of 15 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 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 make use of a magnifying glass.

13. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

14. A 1 : 50 000 topographical map 2829DB LADYSMITH and a 1 : 10 000 orthophoto map 2829 DB 6 LADYSMITH 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.

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: CLIMATE AND WEATHER

1.1 Give ONE term for each of the following descriptions by choosing the term from the list below. Write only the term next to the question numbers (1.1.1 to 1.1.8) in the ANSWER BOOK, for example 1.1.9 cloud.

temperature inversion, frost pocket, anabatic wind, hygroscopic nuclei, isotherm, katabatic wind, radiation fog, advection fog, thermal belt

1.1.1 A type of wind that results from air moving up the valley slope during the day

1.1.2 Forms at night under clear, calm conditions

1.1.3 Lines on a map connecting points having the same temperature

1.1.4 An area where a warm air mass is trapped between two colder air masses

1.1.5 The term used to describe an increase in temperature as height increases

1.1.6 A type of wind that result from air moving down the valley slope at night

1.1.7 Particles of dust, smoke or salt that water vapour sticks to and condenses

1.1.8 Occurs when the temperature of cold air on the valley floor drops to below freezing point (8 x 1) (8)

1.2 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 (1.2.1 to 1.2.7) in the ANSWER BOOK, for example 1.2.8 A.

1.2.1 This system results in stable, fine weather with clear skies

A anticyclones.
B cyclones.
C depressions.
D heat low.

1.2.2 In a thermal low, the air in contact with the earth surface ... and ... towards a low-pressure centre.

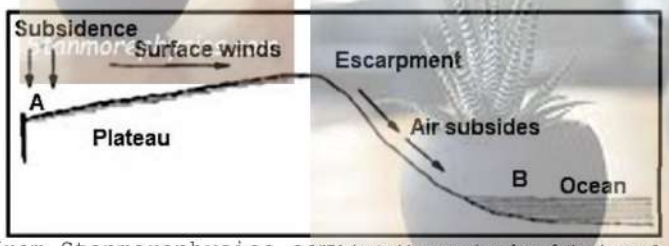
(i) cools
(ii) heats
(iii) diverges
(iv) converges

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

1.2.3 The … deflects mid-latitude cyclones away from the coast in summer.

A Coastal low
B South Indian High-Pressure Cell
C South Atlantic High-Pressure Cell
D Kalahari High-Pressure Cell

1.2.4 The pressure cells … and … at A and B are responsible for the development of a berg wind as indicated in the diagram below,



[Adapted by examiner from fotisedu.com]

(i) Kalahari High-Pressure Cell
(ii) South Indian High-Pressure Cell
(iii) Thermal low
(iv) Coastal low

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

1.2.5 South African berg winds are warm offshore winds due to the ...

A temperatures are warmer above the plateau.
B low-pressure cell that feeds warm moist air from the interior.
C temperature of air that decreases by 1 ℃ per 100 m as it ascends.
D temperature of air that increases by 1 ℃ per 100 m as it descends.

1.2.6 Onshore winds on the west coast are ... and ...

(i) warm
(ii) cold
(iii) dry
(iv) moist

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

1.2.7 In winter ... air compresses and ... adiabatically which causes the inversion layer to be below the escarpment.

(i) sinking
(ii) rising
(iii) heats
(iv) cools

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

(7 x 1) (7)

1.3 Refer to the extract below on Tropical Cyclone Idai.

Death Toll From Idai Rises Above 800: 3rd Deadliest Southern Hemisphere Cyclone on Record

Dr. Jeff Masters · April 1, 2019, 12:03 PM EDT

Above: Cyclone Idai as seen at 12Z March 14, 2019, approaching landfall in Mozambique. Image credit: NASA.

The death toll from horrific Cyclone Idai in southeast Africa has risen above 800, making the storm the third deadliest tropical cyclone on record in the Southern Hemisphere. Only Tropical Cyclone Flora of 1973 (1650 killed in Indonesia) and the 1892 Mauritius Cyclone (1200 deaths in Mauritius) were deadlier.

The official death for Idai on Monday morning stood at 826, with 501 dead in Mozambique, 259 in Zimbabwe, 56 in Malawi, 7 in South Africa, and 3 in Madagascar. According to EM-DAT, Idai is the deadliest flood on record for Zimbabwe, exceeding the toll of 251 in January 2017 from Tropical Cyclone Dineo.

The final death toll from Idai will never be known. Media reports detail that many bodies have been buried without being registered with authorities. The bodies of many other victims have been eaten by crocodiles or washed out to sea, and many will never be found.

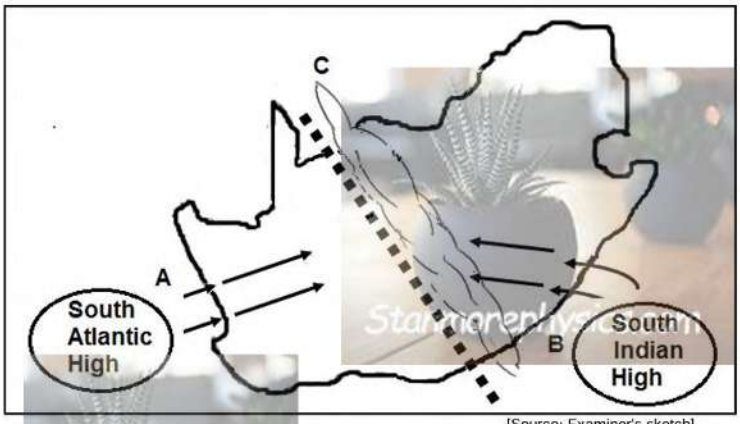
https://www.wunderground.com/cat6/Death-Toll-Idai-Rises-Above-800-3rd-Deadliest-Southern-Hemisphere-Cyclone-Record

1.3.1	During which season do Tropical Cyclones typically occur?	(1 x 1)	(1)
1.3.2	How many Tropical Cyclones had occurred in this ocean before Idai in 2019?	(1 x 1)	(1)
1.3.3	Give ONE reason why the final death toll of Tropical Cyclone Idai will never be known?	(1 x 1)	(1)
1.3.4	Explain TWO conditions necessary for the formation of a Tropical Cyclone.	(2 x 2)	(4)

1.3.5 What is the importance of Madagascar for the eastern coastline of Southern Africa? (1 x 2) (2)

1.3.6 Discuss precautionary measures that can be taken to minimise the impact of Tropical Cyclones. (3 x 2) (6)

1.4 The diagram below shows the presence of a line thunderstorm across South Africa.



[Source: Examiner's sketch]

1.4.1 Does the line thunderstorm obtain its source of moisture from ocean A or B? (1 x 1) (1)

1.4.2 Do line thunderstorms typically occur in summer or in winter? (1 x 1) (1)

1.4.3 Name the feature represented by the dotted line C? (1 x 1) (1)

1.4.4 Explain why line thunderstorms typically occur along the dotted line C. (2 x 2) (4)

1.4.5 State TWO weather conditions associated with the passage of a line thunderstorm (2 x 2) (4)

1.4.6 Explain any TWO precautionary measures that farming communities can take to minimise the impact of line thunderstorms. (2 x 2) (4)

1.5 Refer to the extract below based on urban heat islands.

CITY DWELLERS ARE BEARING THE BRUNT OF EXTREME TEMPERATURES

Thanks to a phenomenon that makes urban areas hotter than their surroundings, cities such as Pretoria are as much as 6 °C hotter than they could be. The heat comes from decades of poor planning. Since the 1950s, the global focus of city infrastructure planning has been on cars and on getting as many people as possible into tall buildings (skyscrapers). In South Africa's six big cities, this means tarred roads crisscrossing what used to be fields, big cement slabs providing parking for the cars, high-rise apartments and office blocks overcrowding their occupants. This both creates and traps heat, which leads to an urban heat island. This effect is worse at night, with cities storing heat. The World Health Organisation (WHO) says urban heat islands, which both raise temperatures and trap pollutants, will have to disappear in this century if future generations are to live healthy lives in cities. A possible way of addressing the issue of heat islands is introducing 'green' strategies. Green strategies are sustainable and do not harm the environment.

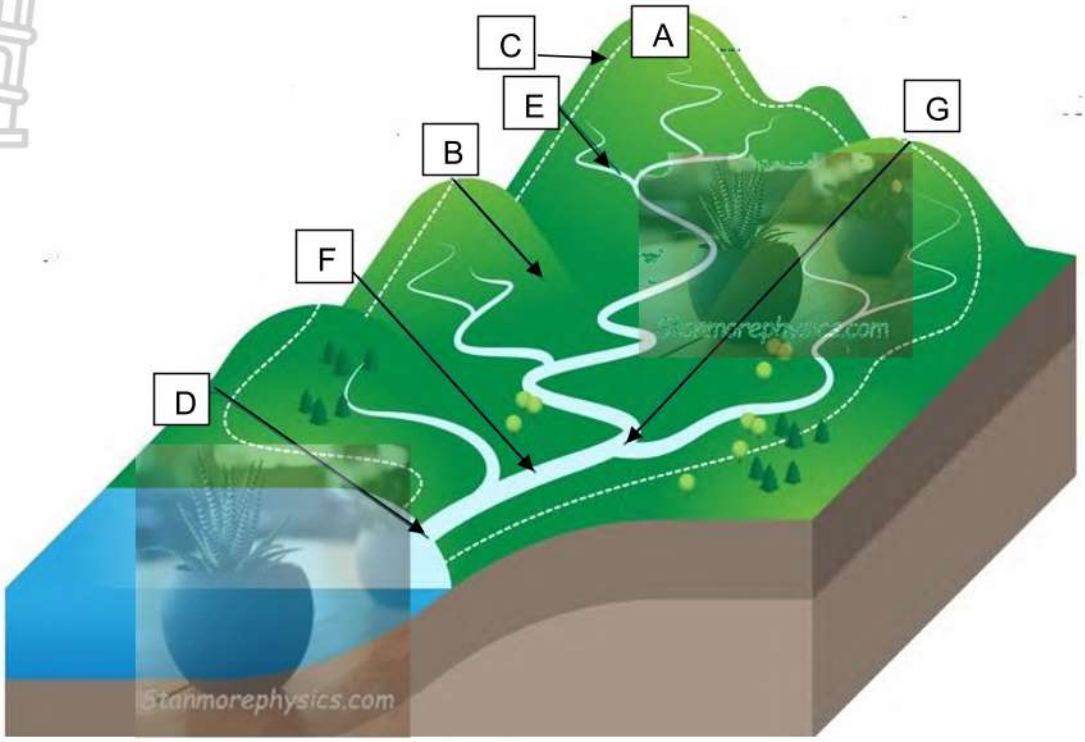
[Adapted from https://mg.co.za/article/2016-01-16-beyond-the-inferno-how-sa-cities-must-green]

1.5.1	Define the concept urban heat island.	(1 x 2)	(2)
1.5.2	Give ONE quotation from the extract that suggests that poor planning is responsible for increasing temperatures in cities.	(1 x 1)	(1)
1.5.3	Why is the urban heat island effect more concentrated at night?	(2 x 2)	(2)
1.5.4	Discuss ONE negative effect of urban heat islands	(1 x 2)	(2)
1.5.5	In a paragraph of approximately EIGHT lines, provide sustainable green strategies, as referred to in the extract, that can reduce the heat island effect.	(4 x 2)	(8)

[60]

QUESTION 2: GEOMORPHOLOGY

2.1 The diagram below depicts the features found in a drainage basin. Give ONE answer for each of the following descriptions by choosing the letter from the diagram below. Write only the letter next to the question numbers (2.1.1 to 2.1.7) in the ANSWER BOOK, for example 2.1.8 H.



2.1.1 The mouth of the river.

2.1.2 A watershed

2.1.3 A main stream

2.1.4 An interfluve

2.1.5 The origin of the river

2.1.6 A tributary

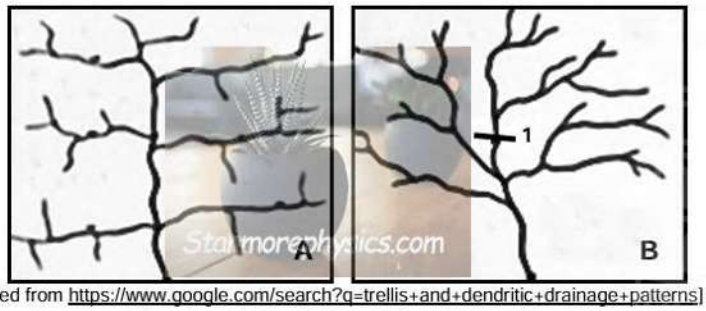
2.1.7 A confluence (7 x 1) (7)

2.2 Choose a term from COLUMN B that matches the characteristic/description in COLUMN A. Write only the letter (A–I) next to the question numbers (2.2.1 to 2.2.8) in the ANSWER BOOK, e.g. 2.2.9 J.

	COLUMN A	COLUMN B
2.2.1	Flat, natural feature next to a river	A. rapid
2.2.2	An embankment along the river where coarse material is deposited first	B. delta
2.2.3	Curves or bends found along the course of a river	C. meanders
2.2.4	When a meander loop becomes separated from the river	D. braided stream
		E. flood plain
2.2.5	Streams with multiple channels and islands of sediment between the channels	F. oxbow lake
2.2.6	A vertical drop in the course of a river as a result of softer rock eroding faster than hard rock	G levee
2.2.7	A depositional landform that occurs when a river flows into the ocean	H. waterfall
2.2.8	A section of a river where the water flows very fast and turbulently over rocks, creating frothy white water	I. main stream

(8 x 1) (8)

2.3 Refer to the diagrams showing drainage patterns.



[Adapted from https://www.google.com/search?q=trellis+and+dendritic+drainage+patterns]

2.3.1 Identify the drainage patterns of rivers **A** and **B**. (2 x 1) (2)

2.3.2 Differentiate between the underlying rock structure of drainage patterns **A** and **B** respectively. (2 x 2) (4)

2.3.3 Why are the tributaries of the main stream parallel to each other in drainage pattern **A**? (1 x 2) (2)

2.3.4 Determine the stream order at point 1 in drainage pattern **B**. (1 x 2) (2)

2.3.5 Choose the CORRECT word between brackets to make the statement TRUE.

The higher the stream order, the (higher / lower) the drainage density. (1 x 1) (1)

2.3.6 Refer to drainage pattern **B** and describe the relationship between;

(a) Drainage density and low rainfall
(b) Drainage density and steep gradient (2 x 2) (4)

2.4 The diagram below illustrates river rejuvenation

RIVER REJUVENATION

[Source: https://alevelrivers.weebly.com/rejuvination.html]

2.4.1 Define the term river rejuvenation. (1 x 2) (2)

2.4.2 Identify the condition that resulted in river rejuvenation. (1 x 1) (1)

2.4.3 Name ONE likely fluvial feature that can form at the knickpoint along the river profile. (1 x 2) (2)

2.4.4 Explain the impact of river rejuvenation on the grading of a river (2 x 2) (4)

2.4.5 Discuss the changes that will occur in the fluvial features found in the illustrated course of the river as a result of river rejuvenation. (3 x 2) (6)

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

RIVER TURNS BLACK AFTER COAL MINE DAM COLLAPSES NEXT TO RURAL COMMUNITIES AND HLUHLUWE-IMFOLOZI GAME RESERVE

By Tony Carie, 11 January 2022

Large volumes of potentially toxic coal mine effluent (waste) have spilled into rivers flowing through rural communities and the Hluhluwe-Imfolozi Game Reserve. According to the US-based Union of Concerned Scientists, mining and coal-washing operations produce high water pollution which can also contain toxic heavy metals such as arsenic copper, lead and manganese.
When the slurry dam* wall collapsed on 24 December, the residents of the affected communities were not warned about the potential hazards until two weeks later. Conservation managers in the neighbouring Hluhluwe-Imfolozi Game Reserve were also led to believe that the spill was under control, only to discover pitch-black water flowing through the reserve several days later.
By this stage, the black water had reached the confluence of the Black and White Imfolozi Rivers.

slurry dam – a dam that is used to store by-products of mining operations after separating the ore

[Adapted from dailymaverick.co.za]

2.5.1	What caused the water in the river to change its colour to black?	(1 x 1)	(1)
2.5.2	Name any TWO toxic heavy metals in the extract that could be found in polluted mine water.	(2 x 1)	(2)
2.5.3	Quote ONE phrase from the extract that indicates that the mining company did NOT disclose (make known) the pollution of the river.	(1 x 2)	(2)
2.5.4	What could have been the negative economic impact of non-disclosure (answer to QUESTION 2.5.3) on the community?	(1 x 2)	(2)
2.5.5	In a paragraph of approximately EIGHT lines, describe the environmental importance of managing the Imfolozi drainage basin AND suggest measures that the local municipality could implement to maintain the future quality of water.	(4 x 2)	(8)

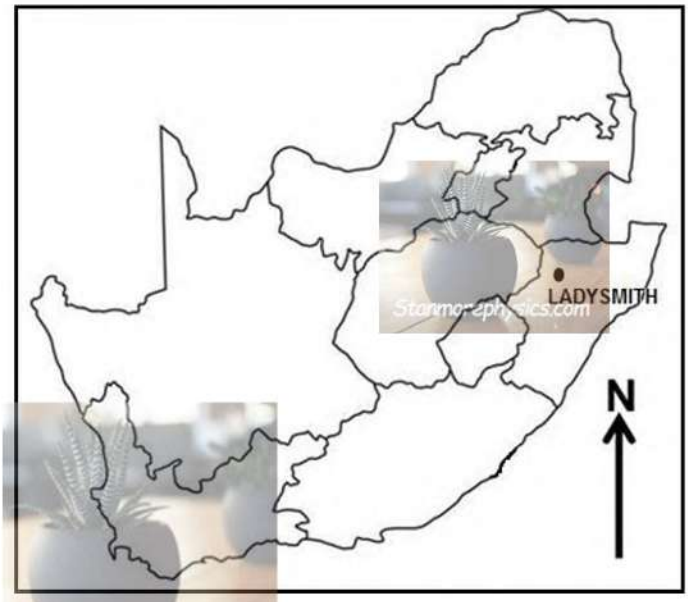
[60]

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON LADYSMITH

Coordinates: 28°33'S; 29°46'E



Ladysmith is a city in the Uthukela District of KwaZulu-Natal. It is situated along the Klip River. The climate is warm and temperate with the highest rainfall recorded in summer. The average annual temperature is 17,3 °C. The average annual precipitation is approximately 1 057 mm. This climate provides ideal conditions for agricultural raw materials.

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

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

ENGLISH	AFRIKAANS
Furrow	Voor
Aerodrome	Vliegveld
Klip River	Kliprivier
Sewage works	Rioolwerke
Weir	Studam

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 Ladysmith receives its highest rainfall in … (1x1) (1)

A summer
B autumn
C winter
D spring

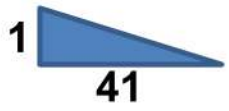
3.1.2 The index contour line in block E2 on the orthophoto map is … metres. (1x1) (1)

A 1085
B 1080
C 1090
D 1070

3.1.3 The town 36 km away from Ladismith is … (1x1) (1)

A Newcastle
B Harrismith
C Glencoe
D Colenso

3.1.4 The illustration below represents the average gradient between spot height 1159 in block **A1** and spot height 1118 in block **A2** on the topographic map.



(a) Determine the difference in height between spot height 1159 and 1118. (1x2) (2)

(b) Does the average gradient shown above represent a gentle or steep slope? (1x1) (1)

(c) Explain why there are no buildings in Thornhill Kop and Bell's Kop. (1x2) (2)

3.1.5 Refer to H in block **B1** and F in block **C2** on the topographical map.

(a) Determine the true bearing (TB) from F to H. (1x2) (2)

[10]

3.2 MAP INTERPRETATION

Refer to the topographical map.

3.2.1	The rainfall in the mapped area is seasonal. Give ONE piece of evidence from block B1 to support this statement.	(1x2)	(2)
3.2.2	The temperature at G is 2°C lower than at F (city centre). Give a reason for this phenomenon.	(1x2)	(2)
3.2.3	Discuss the role of the row of trees in block B4 in reducing air pollution.	(1x2)	(2)
3.2.4	The river in block D4 is in the lower course. Provide ONE reason to support this statement.	(1x2)	(2)
3.2.5	Suggest how the river supports the cultivated land at G.	(1x2)	(2)
3.2.6	Refer to block C5 on the orthophoto map. Why will more deposition take place at **10** than at **11**?	(1x2)	(2) **[12]**

3.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

3.3.1	The environmental feature labelled **J** in block C4 on the topographical map is a … feature. A point B polygon C node D line	(1x1)	(1)
3.3.2	Explain how the feature labelled **J** is an environmental issue.	(1x2)	(2)
3.3.3	The reference of the topographical map represents (spatial/attribute) data.	(1x1)	(1)
	Refer to **12** in block C2 on the orthophoto map		
3.3.4	Define the term buffering.	(1x2)	(2)
3.3.5	How would buffering at 12 protect the quality of the water in the Klip River?	(1x2)	(2) **[8]**

30

TOTAL: 150

METRO CENTRAL EDUCATION DISTRICT

COMMON TRIAL EXAM

GRADE 12

GEOGRAPHY PAPER 1
29 AUGUST 2025

UPDATED MARKING GUIDELINE

MARKS: 150

TIME: 3 hours

This paper consists of 14 pages

The following marking principles have been developed to standardise marking in all provinces.

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 over the remainder of the text to indicate the maximum marks have been achieved.
- Where a correct fact has been mentioned more than once in a specific response
- 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**

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 sub-section 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

30

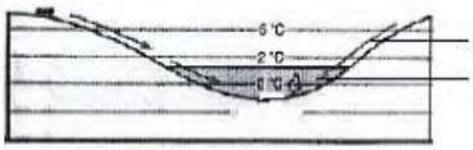
QUESTION 1

1.1.1 A (South Atlantic High) (1) ✓
1.1.2 B (Kalahari High) (1) ✓
1.1.3 B (South Indian) (1) ✗ **2**

1.2.1 Melting snow ✓
1.2.2 Mouth ✗
1.2.3 Third order ✓ **2**

1.3.1 Katabatic ✗
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 Shape of front concave ✗
Steep gradient of front ✓

1.4.2 Warm air undercuts the cold air ✗

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. **7**

1.5.1 (a) A river that only flows all year round ✗

(b) The river channel is wide ✗

(c) Regularity of rainfall and the soil type over which the streams flow.

1.5.2 Gauteng and the Eastern Cape

1.5.3 The cost of food production will increase at 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. These costs will be included in electricity prices. Costs will increase the price of electricity during production. There will be less clean water to generate hydro- electricity. **13**

SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY
QUESTION 1: CLIMATE AND WEATHER

1.1
1.1.1 anabatic wind (1)
1.1.2 radiation fog (1)
1.1.3 Isotherm (1)
1.1.4 thermal belt (1)
1.1.5 temperature inversion (1)
1.1.6 katabatic wind (1)
1.1.7 hygroscopic nuclei (1)
1.1.8 frost pocket (1) (8 x 1) (8)

1.2
1.2.1 A (1)
1.2.2 D (1)
1.2.3 C (1)
1.2.4 B (1)
1.2.5 D (1)
1.2.6 C (1)
1.2.7 A (1) (7 x 1) (7)

1.3.1 Summer (1) / Early Autumn (1)
ANY ONE (1 x 1) (1)

1.3.2 8 (1) (1 x 1) (1)

1.3.3 Bodies buried without being registered (1)
Bodies had been eaten by crocodiles (1)
Bodies had been washed out to sea (1)
ANY ONE (1 x 1) (1)

1.3.4 Sea surface temperatures must be above 27°C for evaporation to occur and produce latent heat. (2)
Coriolis force is needed to cause spiralling winds. (2)
Converging winds near the ocean surface forcing air to rise and form storm clouds. (2)
ANY TWO – must qualify answer (2 x 2) (4)

Part marking

Sea surface temperatures must be above 27°C (1)
Coriolis force (1)
Converging winds near the ocean (1)
ANY TWO (2 x 1) (2)

1.3.5 Madagascar shields / protects the eastern coastline from being struck by tropical cyclones.(2)
It weakens when over Madagascar (2)
Madagascar slows it down/ (2)
Madagascar protects South Africa from the full strength of the tropical cyclone (2)
The friction over the land weakens the tropical cyclone (2)
ANY ONE (1 x 2) (2)

1.3.6 Ensure that there is a disaster management plan (2)
Monitor the path of the cyclone and its development (2)
Using remote sensors on satellite to track the cyclone (2)
Satellite sensors to collect details, e.g. rainfall rates. (2)
Advanced weather predictions and warnings. (2)
Early warning and communication for people to prepare (2)
Prepare evacuation plans (2)
Evacuate low-lying areas to protect people against floods (2)
Build strong shelters where people can gather before a storm arrives (2)
Upgrade technology (2)
Ensure infrastructure is of good quality (2)
Stock up on non-perishable food, bottled water, torches, medication (2)
Awareness campaigns / Education (2)
ANY THREE (3 x 2) (6)

1.4

1.4.1	B (1) **OR** Indian Ocean (1)	(1 x 1)	(1)
1.4.2	summer (1)	(1 x 1)	(1)
1.4.3	moisture front (1) / trough line (1)	(1 x 1)	(1)
1.4.4	Convergence of air masses from the two high-pressure systems (2) Warm, moist air from Indian Ocean meets cooler, drier air from Atlantic (2) Rising air creates instability and convection (2) **ANY TWO**	(2 x 2)	(4)
1.4.5	Heavy rainfall / thundershowers (2) Lightning (2) Strong gusty winds (2) Hail (2) Decrease in temperature (2) Low cloud cover (2) Cumulonimbus clouds (2) High humidity (2) **ANY TWO**	(2 x 2)	(4)
1.4.6	Install lightning conductors on farm buildings (2) Move livestock to sheltered areas (2) Secure / cover crops susceptible to hail damage (2) Monitor weather warnings / forecasts (2) Ensure drainage systems are clear (2) Store farming equipment under cover (2) Have emergency communication systems ready (2) Emergency evacuation plans (2) **ANY TWO**	(2 x 2)	(4)

1.5

1.5.1 An area of high temperature over the city that decreases towards the rural area / phenomenon that makes urban areas hotter than their surroundings (2)
CONCEPT (1 x 2) (2)

1.5.2 'the global focus of city infrastructure planning has been on cars' (1)
'getting as many people as possible into tall buildings' (1)
'Heat comes from decades of poor planning' (1)
'office blocks overcrowding their occupants' (1)
'tarred roads criss-crossing' (1)
'big cement slabs' (1)
ANY ONE (1 x 1) (1)

1.5.3 Subsiding air at night pushes the warm air closer to buildings in the city which results in more heat being concentrated (in a smaller area) (2)
Weaker convection currents at night concentrates the heat island effect (2)
Subsiding air traps the heat between buildings (2)
ANY ONE (1 x 2) (2)

1.5.4 Heat-related illnesses (heat exhaustion, heat stroke) (2)
Increased mortality rates during heat waves (2)
Respiratory problems due to poor air quality (2)
Dehydration and cardiovascular stress (2)
Increased demand for air conditioning (2)
Higher electricity consumption during peak hours (2)
Strain on power grid / load shedding (2)
Increased energy costs (2)
Increases pollution / acid rain (2)
ANY ONE (1 x 2) (2)

1.5.5 Plant more trees to absorb more carbon dioxide (2)
Establish roof gardens / vertical gardens on high rise buildings (2)
Create parks / greenbelts in the urban area (2)
Reduce carbon emissions in urban areas by making use of solar energy (2)
Reduce carbon emissions in urban areas by making use of wind energy (2)
Replace concrete / tar surfaces with cobble stones which allow infiltration of water and cooling through evaporation (2)
Promote urban farming that will result in more evapotranspiration and cooling of temperatures (2)
Use of public transport / cycling to reduce the number of vehicles on the roads (2)
Reduce the number or vehicles on the road (accept examples) (2)
Use of reflective paint on buildings and roofs (2)
Reducing our carbon footprint through recycling and re-using of products (2)
Modernisation of buildings with greener materials (accept examples) (2)
Implementing energy saving strategies (accept examples) (2)
Encourage the use of hybrid cars which produce no pollution (2)
Use of catalytic converters in motor vehicles (2)
Creation of water features (accept examples) (2)
Green policy to be included in all legislation (2)
Awareness / education campaigns on green policies (2)
Incentives for going green / eco-friendly products (accept examples) (2)
ANY FOUR – ACCEPT QUALIFIED EXAMPLES

(4 x 2) (8)

[60]

QUESTION 2: GEOMORPHOLOGY

2.1

2.1.1 D. (1)

2.1.2 C (1)

2.1.3 F (1)

2.1.4 B (1)

2.1.5 A (1)

2.1.6 E (1)

2.1.7 G (1) (7 x 1) (7)

2.2

2.2.1 E Floodplain(1)

2.2.2 G Levi (1)

2.2.3 C Meander(1)

2.2.4 F Oxbow lake (1)

2.2.5 D Braided Stream (1)

2.2.6 H Waterfall (1)

2.2.7 B Delta (1)

2.2.8 A Rapids (1) (8 x 1) (8)

2.3

2.3.1	**A** Trellis (1) **B** Dendritic (1)	(2 x 1)	(2)
2.3.2	**A** Alternate layers of hard and soft rock / folded rock structure / undulating rock structure (2) **B** Rock that is uniformly resistant to erosion (2)	(2 x 2)	(4)
2.3.3	The streams flow in relation to the folds of the rock (2) The streams flow over softer rock of the syncline / valley (2) Interfluves are parallel (2) **ANY ONE**	(1 x 2)	(2)
2.3.4	3rd (order) (2)	(1 x 2)	(2)
2.3.5	Higher (1)	(1 x 1)	(1)
2.3.6	(a) Low rainfall will result in a lower drainage density (2) (b) The steep gradient will result in a higher drainage density (2	(2 x 2)	(4)

2.4

2.4.1 When a river is eroding the landscape downwards in response to a lowering/change of its base level (2)
OR
River rejuvenation is a process where rivers (are re-energised to) actively erode downward again (2)
CONCEPT (1 x 2) (2)

2.4.2 A drop in the sea level (1) (1 x 1) (1)

2.4.3 Waterfall / rapids (1) (1 x 2) (2)

2.4.4 Rejuvenated rivers will be ungraded/obstructions along the course as a result of renewed downward erosion (2)
River will now show a multi-concave profile (2)
Temporary base levels of erosion will develop (examples: knickpoint, rapids, waterfall) (2)
Overgraded river as renewed downward erosion now takes place (2)
Vertical erosion downstream of the knickpoint dominates (2)
The balance between erosion and deposition is disturbed (2)
ANY TWO (2 x 2) (4)

2.4.5 Knickpoints can form because of the old erosion level meeting the new erosion levels (2)
The knickpoint retreats upstream (2)
Waterfall can form at the knickpoint due to the lowering along the course of the river (2)
Waterfalls can turn into rapids (2)
Meanders will become more incised and entrenched (erode vertically) (2)
River cuts into the flood plain forming a new flood plain (2)
A valley within a valley forms because of vertical erosion (2)
Valleys with multi-terraced slopes will form (2)
River channel becomes narrower (2)
New floodplain is narrower than the original flood plain (2)
More meanders develop (2)
Formation of a gorge
ANY THREE (3 x 2) (6)

2.5

2.5.1 Coal mine waste have spilled into rivers (1)
Polluted mine waste burst from a slurry dam (1)
ANY ONE (1 x 1) (1)

2.5.2 Arsenic copper (1) **(NOT COPPER)**
Lead (1)
Manganese (1)
ANY TWO (2 x 1) (2)

2.5.3 "residents of the affected communities were **not warned** about the potential hazards until two weeks later" (2)

"Conservation managers in the neighbouring Hluhluwe – Imfolozi Game Reserves were also made to believe that the spill was **under control**" (2)
ANY ONE (1 x 2) (2)

2.5.4 Eco-tourism affected (2)
Businesses in the community negatively affected (2)
Agricultural activities negatively affected (2)
Future investments in the communities limited (2)
Contamination of agricultural products (2)
Increase in medical bills (2)
(Water) purification is expensive (2)
Job losses (2) (1 x 2) (2)
ANY ONE

2.5.5 **IMPORTANCE:**
To ensure the availability of water (2)
To maintain water quality (2)
To preserve aquatic life (2)
To ensure that the ecosystem remains healthy (2)
To preserve biodiversity/ecosystem/habitat (2)

MEASURES:
Continuous monitoring of the dam (2)
Regular maintenance of the dam (2)
Frequent testing of water quality (2)
Impose fines to companies which do not comply (with regulations) (2)
Create buffer zone around slurry dam (2)
Educate community on the precautionary measures (2)
Awareness campaigns for people (bill boards, no dumping site signs) (2)
Implement policy/legislation (2)
Conserve natural vegetation in the drainage basins (2)
Regulate or control extraction of groundwater (2)
Promote sustainable farming methods upstream (2)
Impose fines (2)
ANY FOUR, RESPONSES MUST INCLUDE BOTH THE IMPORTANCE AND MEASURES (4 x 2) (8)

[60]

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

3.1 MAP SKILLS AND CALCULATIONS

3.1.1 A (1) (summer) (1x1) (1)

3.1.2 B (1) 1080) (1x1) (1)

3.1.3 C (1) Glencoe (1x1) (1)

3.1.4 (a) 1159m – 1118m= 41m (2) (1x2) (2)

(b) Gentle slope (1) (1x1) (1)

(c) The slope or gradient is steep. (2)
It is expensive to build on a steep slope. (2)
There is a high risk of landslide, mass movement or erosion. (2)
ANY ONE (1x2) (2)

3.1.5 (a) 337° (2) **OR** 338° (2) (1x2) (2)

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3.2 MAP INTERPRETATION

3.2.1 Perennial water or dam (2)
Reservoir. (2) (1x2) (2)

3.2.2

F (high temperature)	G (low temperature)
Concrete surfaces that retain heat. (2) Dark colour buildings that absorb heat. (2) Few unconstructed (open) spaces (2) Less cultivation (2) **ANY ONE**	Few constructed buildings. (2) Large cultivated land. (2) More open spaces (2)

(1x2) (2)

3.2.3 Trees absorb carbon dioxide (CO^2). (2)
Trees release oxygen (O^2). (2)
ANY ONE (1x2) (2)

3.2.4 The river is meandering. (2)
The gradient is gentle. (2)
ANY ONE (1x2) (2)

3.2.5 Provides water for irrigation (2)
Deposition results in fertile soil (2)
ANY ONE (1x2) (2)

3.2.6 The gradient is gentle at **10**. (2) **OR** Flat floodplain (2)
The river's velocity or speed is slow. (2)
Wider river channel (2)
ANY ONE (1x2) (2)

[12]

3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1	B (1) polygon	(1x1)	(1)
3.3.2	The feature is an excavation, it causes air and land pollution / k land degradation (2)	(1x2)	(2)
3.3.3	Spatial (1) (data)	(1x1)	(1)
3.3.4	Demarcation of an area around a geographical feature or location (2)	(1x2)	(2)
3.3.5	Restrict development on the banks of the river (2) Decrease pollution from the built-up area (2) Reduces eroded soil from entering the river (2) Decreased eutrophication (2) Reduces salinity (2) The natural course/capacity of the river will be maintained (2) Biodiversity of the river will be preserved (2) **ANY ONE**	(1x2)	(2)
			[8]
			[30]

TOTAL: 150