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PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**GEOGRAPHY PAPER 1
JUNE 2023**

MARKS: 150

TIME: 3 hours

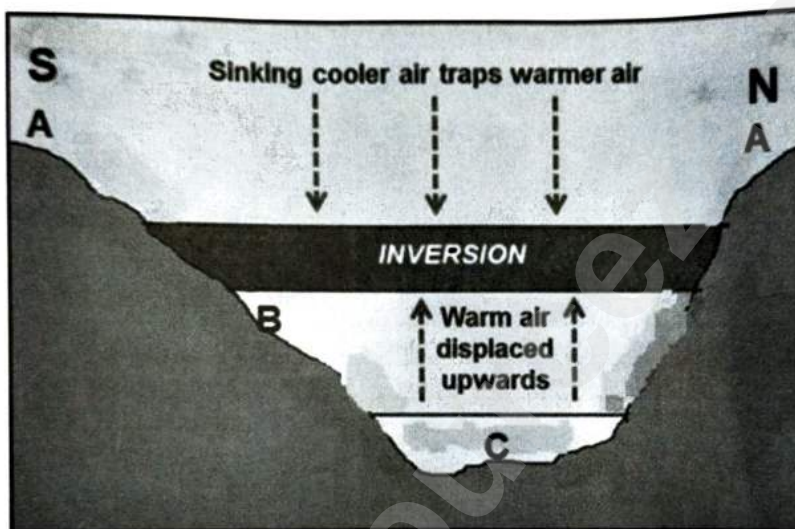


MEGEOGP1

This question paper consists of 16 pages.

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

- 1.1 Refer to the sketch below showing valley climates around South Africa. Choose the correct word(s) in brackets to make the statements TRUE. Write only the correct word(s) next to the question numbers in the ANSWER BOOK e.g., 1.1.9



[Source: <https://online.htseden.co.za/wp-content/uploads/2021/03/Geography-Grade-12/>]

- 1.1.1 The sketch shows valley climate conditions during the (day/night).
1.1.2 The air (sinks/rises) at slope B.
1.1.3 Air pressure at C will be (higher/lower).
1.1.4 Crop farming will be (positively/negatively) affected at C.
1.1.5 (Frost pockets/mist) will develop at slope C.
1.1.6 (Insolation/terrestrial radiation) occurs at slope A.
1.1.7 Slope B will be more suitable for settlements in the (northern/southern) Hemisphere.
1.1.8 Slope B is more suitable for (sun loving plants/cold resistant plants).

(8 x 1) (1)

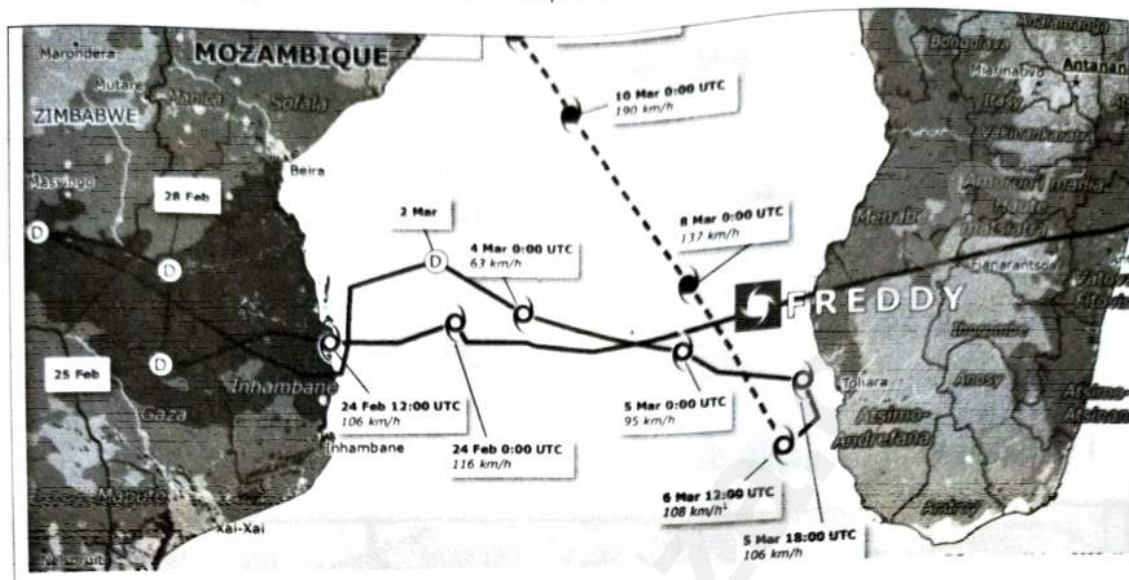
- 1.2 Refer to the sketch below of cross-section of a mid-latitude cyclone. Complete the statements in COLUMN A with the options in COLUMN B. Write only Y or Z next to the question numbers (2.1.1 to 2.1.8) in the ANSWER BOOK, e.g., 2.1.9 Y



[Source: <https://www.ux1.eiu.edu/~cfjps/1400/fronts.html>]

COLUMN A	COLUMN B
1.2.1 The diagram represents a ... front occlusion.	Y: cold Z: warm
1.2.2 The system moves in a/an ... direction.	Y: eastward Z: westwards
1.2.3 Air behind front A is ...	Y: light Z: dense
1.2.4 Severe weather conditions and thunderstorms occur ... front A.	Y: behind Z: ahead
1.2.5 Rainfall associated with front B covers a ... area	Y: larger Z: smaller
1.2.6 When front A becomes dominant in the system, winds start... in South Africa.	Y: backing Z: veering
1.2.7 The area behind front B is called the ... sector	Y: cold Z: warm

1.3 Refer to the infographic below on Tropical Cyclone Freddy.



Tropical cyclone Freddy is continuing its incredible and dangerous journey and is on track to break the record as the longest-lasting tropical cyclone on record. Freddy developed off the North Australian coast and became a named storm on 6 February. It crossed the entire South Indian Ocean and made landfall in Madagascar on 21 February and then in Mozambique on 24 February. The storm spent several days tracking over Mozambique and Zimbabwe, bringing heavy rains and flooding. It then looped back towards the Mozambique Channel and picked up energy from the warm waters and moved towards the south-western coast of Madagascar. "Freddy is having a major socio-economic and humanitarian impact on affected communities. The death toll has been limited by accurate forecasts and early warnings, and coordinated disaster risk reduction action on the ground - although even one casualty is one too many," said Dr Johan Stander, WMO Services Director.

[Source:
<https://reliefweb.int/report/mozambique/tropical-cyclone-freddy-may-set-new-record>]

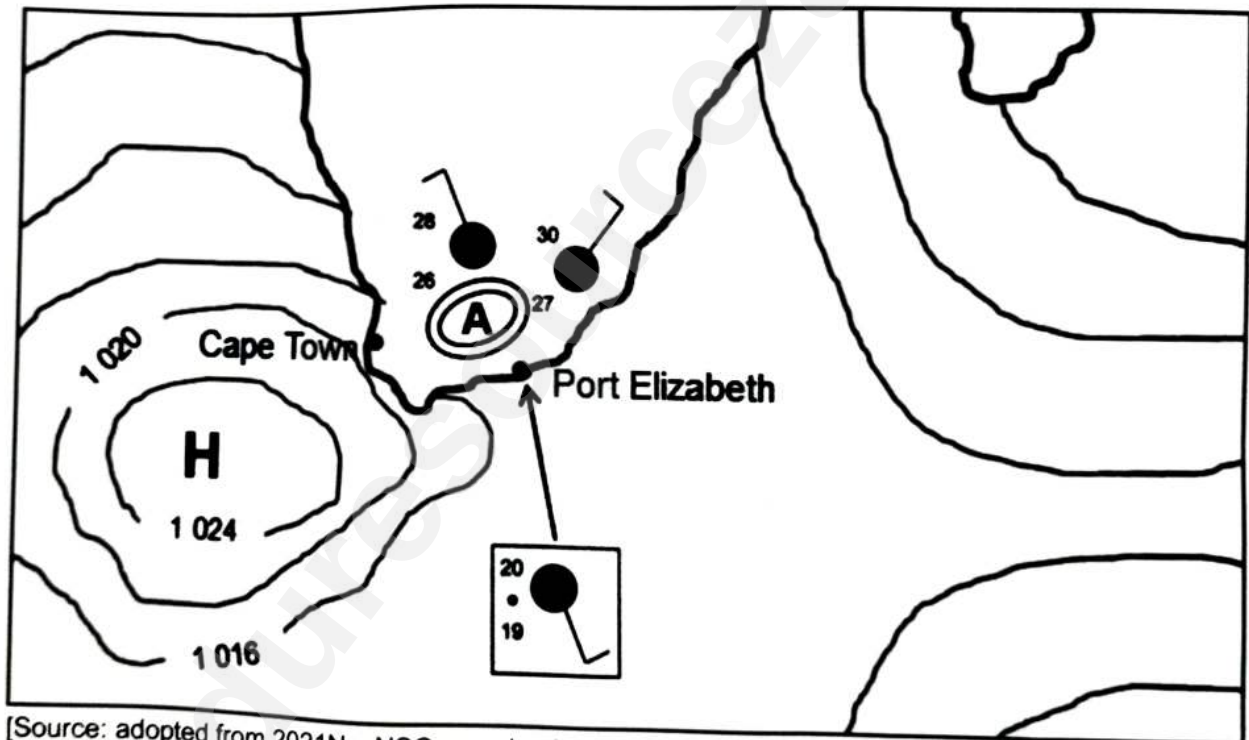
TYPE OF IMPACT	STATISTICS
Fatalities	10
Evacuation	9892
Affected people	166 595
Damaged and destroyed homes	28 366

1.3.1 Is tropical cyclone Freddy a weather system? (1 x 1) (1)

Geography/P1

- 1.3.2 Why is the cyclone moving towards the west? (1 x 2) (2)
- 1.3.3 Describe the record that Freddy has set in the history of Tropical cyclones in the Southern Hemisphere. (1 x 2) (2)
- 1.3.4 Explain how Clone Freddy managed to break the record in QUESTION 1.3.3 (1 x 2) (2)
- 1.3.5 Suggest reasons why after such a long period of existence, Freddy is associated with less fatalities. (2 x 2) (4)
- 1.3.6 Describe the social impacts of Cyclone Freddy. (2 x 2) (4)

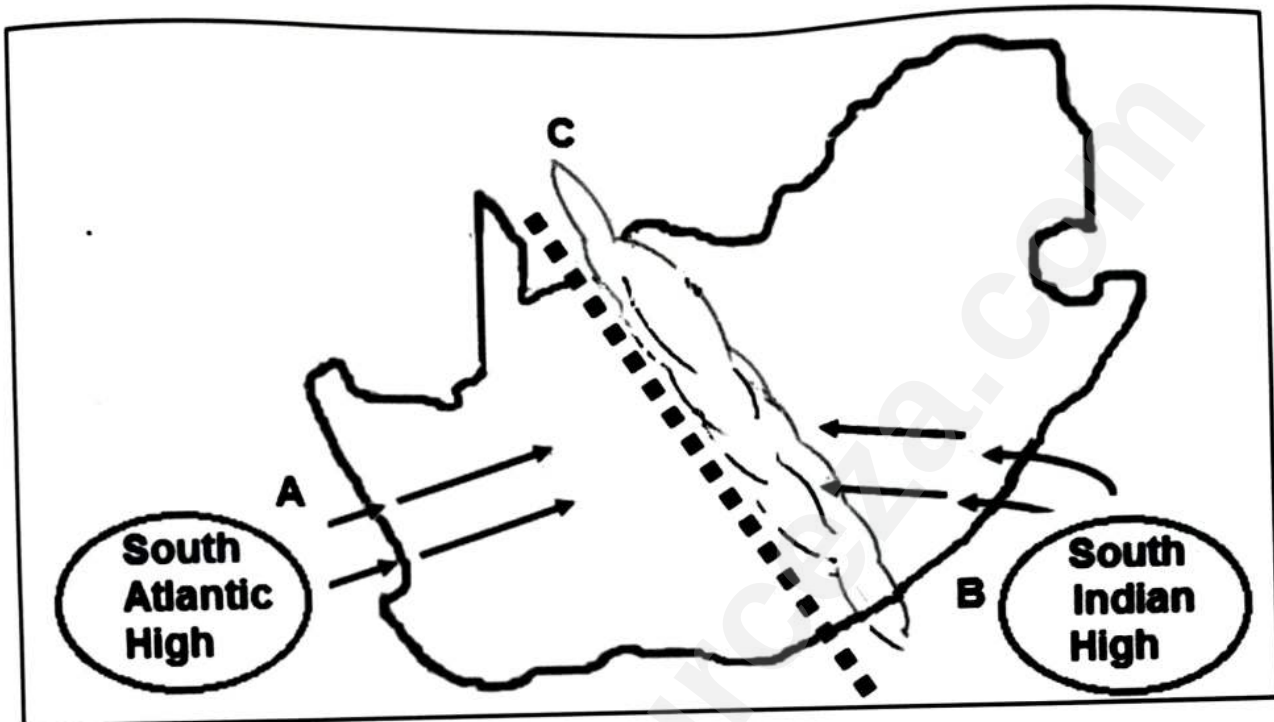
1.4 Refer to the synoptic weather chart below:



[Source: adopted from 2021NovNSC examinations]

- 1.4.1 State the season represented by the synoptic weather chart. (1 x 1) (1)
- 1.4.2 Motivate your answer in QUESTION 1.4.1. (1 x 2) (2)
- 1.4.3 Describe the type of air circulation around pressure cell A. (1 x 2) (2)
- 1.4.4 Account for the type of air circulation in QUESTION 1.4.3. (1 x 2) (2)
- 1.4.5 Give a reason why the air mass at Port Elizabeth is moist? (2 x 1) (2)
- 1.4.6 Explain how the type of rainfall most likely to occur at A is formed. (3 x 2) (6)

1.5 Refer to the sketch of a moisture front and line thunderstorm.



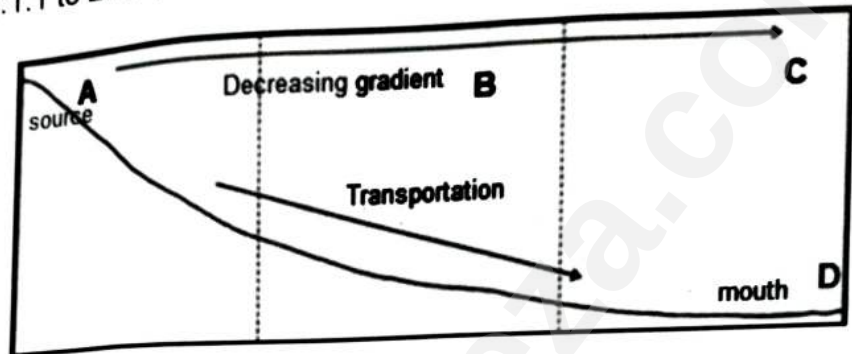
[Source: adopted from 2020NovNSC]

- 1.5.1 Define the concept *moisture front*. (1 x 2) (2)
- 1.5.2 Identify the cloud type at C. (1 x 1) (1)
- 1.5.3 Explain why air mass B is laden with moisture. (1 x 2) (2)
- 1.5.4 Explain why air mass A and air mass B meet in the interior of the country. (1 x 2) (2)
- 1.5.4 In a paragraph of approximately EIGHT lines examine the impact of line thunderstorms on the natural physical environment. (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) ANSWER BOOK, e.g. 2.1.9 Y



[source:<https://alevelrivers.weebly.com/the-long-profile.html>]

- 2.1.1 The dominant process at A is ...

A Lateral erosion
B Deposition
C Saltation
D Vertical erosion

- 2.1.2 The velocity of the stream is ... at C.

A High
B Slow
C Medium
D Balanced

- 2.1.3 The type of slope at A produces ...

A flood plains
B meander
C U-shaped valleys
D V-shaped valleys

- 2.1.4 An example of fluvial landform found at C is ...

A Rapid
B Waterfall
C Delta
D Knick-point

2.1.5 Decreasing gradient at B may lead to ...

- A Deposition
- B Lateral erosion
- C Vertical erosion
- D Lateral erosion and deposition

2.1.6 The volume of water is the... at C.

- A Constant
- B Highest
- C Lowest
- D Same

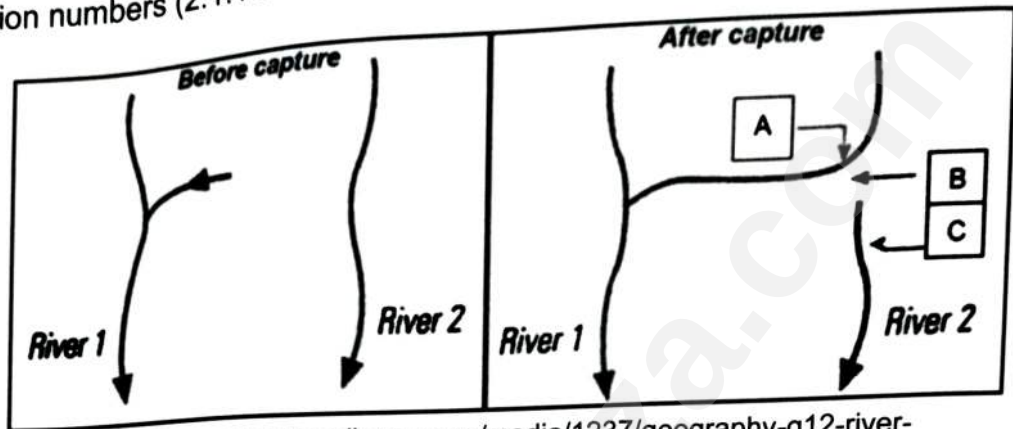
2.1.7 Stream order of a river is the lowest in the ... course of a river.

- A Upper
- B Middle
- C Lower
- D Upper, middle, lower

2.1.8 Stream capture occurs in the ... course of a river.

- A Upper
- B Middle
- C Lower
- D All the above

- 2.2 Refer to the sketch below of river capture. Complete the statements in COLUMN A with the options in COLUMN B. Write only **Y** or **Z** next to the question numbers (2.1.1 to 2.1.8) in the ANSWER BOOK, e.g. 2.1.9 Y

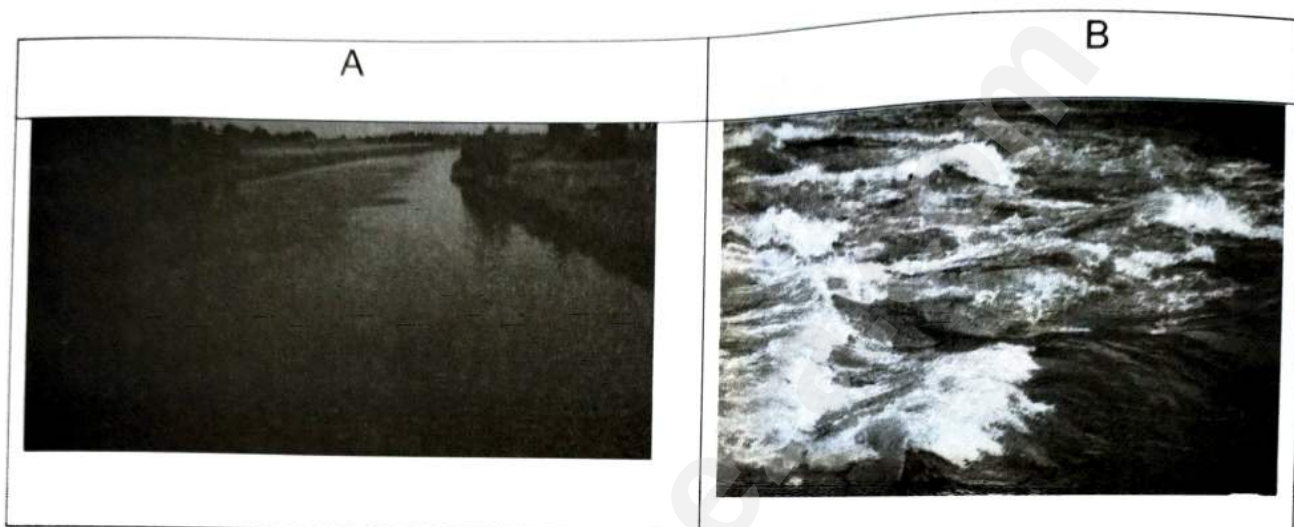


[source: <https://www.graemecollege.co.za/media/1237/geography-g12-river-capture.pdf>]

COLUMN A	COLUMN B
2.2.1 The more active stream before capture is ...	Y: River 1 Z: River 2
2.2.2 High-lying area that separates drainage basins of River 1 and River 2 is called ...	Y: watershed Z: interfluvium
2.2.3 The dominant geological process leading to river capture is ...	Y: deposition Z: headward erosion
2.2.4 Fluvial landform at B is a ...	Y: windgap Z: elbow of capture
2.2.5 The conditions of a captured river downstream are a/an ... to the ecosystem.	Y: advantage Z: disadvantage
2.2.6 ... will experience rejuvenation after river capture	Y: River 1 Z: River 2
2.2.7 ... will become a prominent feature in River 1 after capture.	Y: drought Z: flooding

(7 x 1) (7)

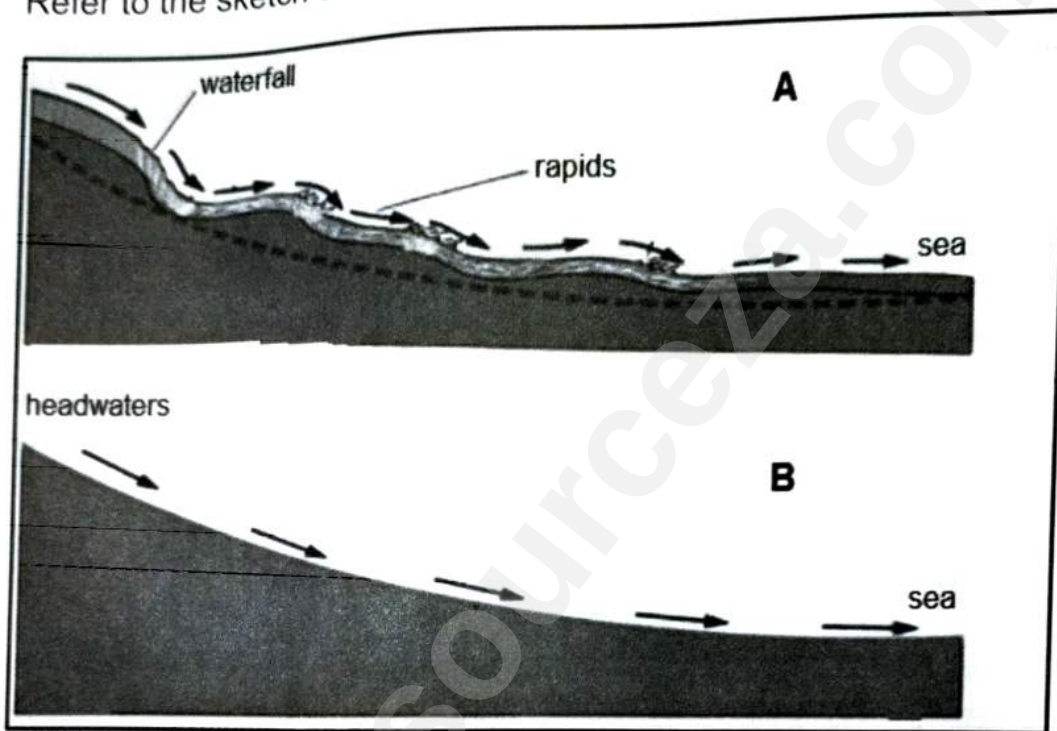
2.3 Refer to the pictures A and B below illustrating river discharge.



[Source http://ffden2.phys.uaf.edu/104_2012_web_projects/Shallyn_Farrington/site/physics/whitewaterrafting/fluid-dynamics/index.html]

- 2.3.1 Define the concept *river discharge*. (1 x 2) (2)
- 2.3.2 River flow A represents (laminar/turbulent). (1 x 1) (1)
- 2.3.3 Explain why river discharge B could be considered for eco-tourism. (1 x 2) (2)
- 2.3.4 Give reasons why it may be impossible for a river to maintain the same type of discharge from the source to the mouth. (2 x 2) (4)
- 2.3.5 Explain why the type of flow in B is common in the upper course. (3 x 2) (6)

2.4 Refer to the sketch on river grading below.



[source: <http://www.eccurriculum.co.za>]

- 2.4.1 Define the term *river grading*. (1 x 2) (2)
- 2.4.2 State TWO fluvial processes involved in river grading. (2 x 1) (2)
- 2.4.3 (a) State whether profile A is graded or ungraded. (1 x 1) (1)
- (b) Support your answer in QUESTION 2.4.3 (a) (1 x 2) (2)
- 2.4.4 Explain why the sea is regarded as permanent base level in terms river grading. (1 x 2) (2)
- 2.4.5 Explain the process in which river A transforms into river B. (3 x 2) (6)

- 2.5 Refer to the extract below on water quality problems caused by mining activities.

Water supplies continue to dwindle because of resource depletion and pollution, whilst demand is rising fast because of population growth, industrialisation, mechanisation, and urbanisation. Over 70% of the water used in both rural and urban areas in South Africa is surface water drawn from rivers, streams, lakes, ponds, and springs (DWA, 2004).

Water draining from coal and base metal mines frequently contains sulfuric acid and heavy metals at high levels which could contaminate streams and agricultural lands, when the mine water or mine water-affected stream water is used for irrigation purposes.

Entry of mine-originated contaminants into agricultural soils and streams may also occur during heavy rainfall events that cause over-bank flooding. Elevated concentrations of heavy metals in the soils and streams, accompanied with acidic pH, are likely to enhance uptake of heavy metals by plants and man, which poses a high health risk to the people who consume the contaminated agricultural products. Increasingly, human activities threaten the water sources on which we all depend.

There is a growing awareness worldwide of the environmental legacy of mining activities that have been undertaken with little concern for the environment (EMCBC, 2001). Mining by its nature consumes, diverts, and can seriously pollute water resources. Changes in laws, technologies and attitudes have begun to address some of the most immediate threats posed by coal development. We need to do everything possible to protect our water resource and ensure that no harm comes to society because of contaminated water. And the mining industry needs to implement this necessary water treatment and saving processes to do so.

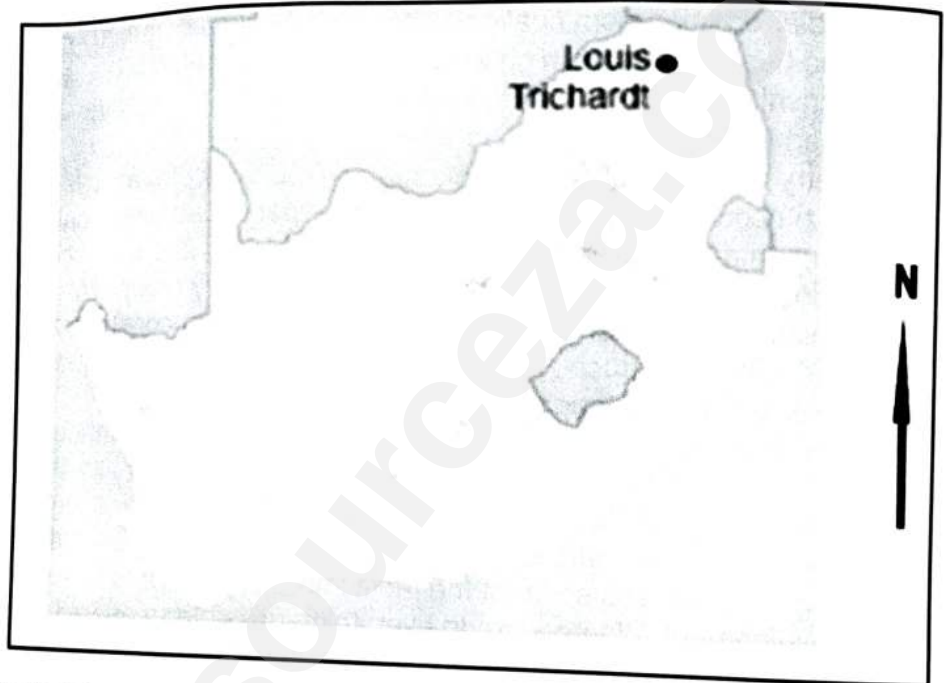
[Source: https://www.researchgate.net/publication/228513226_Impacts_of_mining_on_water_resources_in_South_Africa_A_review]

- 2.5.1 Name ONE cause of diminishing water supply. (1 x 1) (1)
- 2.5.2 According to the extract how does polluted water from mining affect agriculture. (1 x 2) (2)
- 2.5.3 Give reasons why there is a "high health risk to the people who consume contaminated agricultural products." (2 x 2) (4)
- 2.5.4 In a paragraph of approximately EIGHT lines suggest strategies that government can implement to minimise the impact of mining in pollution of water resources. (4 x 2) (8)

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION OF LOUIS TRICHARDT



Coordinates: 23° 03' 00" S 29° 54' 00" E

Louis Trichardt is a town at the foot of Songozwi, in the Soutpansberg mountain range in the Limpopo province. It is the centre of the Makhado Local Municipality, which comprises 16,000 km² with a total population of 86 980. Louis Trichardt is located in a fertile region where subtropical fruit like litchis, bananas, mangoes and nuts are produced. The town receives an average summer rainfall of about 449mm. The N1 National Route runs through the town. Louis Trichardt is 437 kilometres from Johannesburg and one hour's drive from the Zimbabwean border at Beitbridge. [Adapted from https://en.wikipedia.org/wiki/Louis_Trichardt]

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

English

Diggings

River

Mine dumps

Afrikaans

Uitgravings

Rivier

Myndop

3.1 MAP SKILLS AND CALCULATIONS

- 3.1.1 The height of the trigonometric beacon in block **E4** is (96/1132,4)
(1 x 1) (1)
- 3.1.2 23 in 2329BB Louis Trichardt refers to
 A altitude
 B latitude
 C longitude
 D code
 (1 x 1) (1)
- 3.1.3 Calculate the magnetic declination of Louis Trichardt. Show all calculations.
(5 x 1) (5)
- 3.1.4 Identify the feature labelled **L** on the orthophoto.
(1 x 1) (1)
- 3.1.5 The contour interval of orthophoto map 2329BB LOUIS TRICHARDT is ... metres
 A 5
 B 10
 C 15
 D 20
 (1 x 1) (1)
- 3.1.6 Explain why the type of vegetation in block **J1** and block **J2** is referred to as cultural.
(1 x 2) (2)

3.2 MAP INTERPRETATION

Refer to block **C5** of the topographical map.

- 3.2.1 (a) Are streams in pattern spot height 1346 perennial or non-perennial?
(1 x 1) (1)
- (b) Explain your answer in QUESTION 3.2.2.
(1 x 2) (2)
- 3.2.2 (a) Name the wind type that blows between spot height 1522 in block **A2** to spot height 1056 in block **D3** during the day.
(1 x 1) (1)
- (b) Explain how the wind in QUESTION 3.2.4 (a) occurs.
(1 x 2) (2)
- 3.2.3 Refer to block **D1** and **D2**
 Explain why farmers in this area would prefer planting frost resistant crops.
 (1 x 2) (2)

Geography/P1

- 3.2.4 The slope of the area in block **D1** and **D5** on the orthophoto is gentle. Give evidence to support the statement. (1 x 2) (2)
- 3.2.5 The area covered by the orthophoto would generally have a higher rate of infiltration. Support this statement with evidence from the topographical map. (1 x 2) (2)

3.3

GEOGRAPHICAL INFORMATION SYSTEMS

- 3.3.1 State the attributes of the road that passes through block **K9- J10** (1 x 1) (1)
- 3.3.2 The road is recorded as ...
 A point
 B line
 C polygon
 D grid (1 x 1) (1)
- 3.3.3 Explain why the resolution of the orthophoto is classified as being high. (1 x 2) (2)
- Refer to the topographical map.
- 3.3.4 Define the concept *data standardisation*. (1 x 2) (2)
- 3.3.5 Explain how standardisation of geographical data would help international tourists in South Africa. (1 x 2) (2)

[30]

TOTAL: 150