GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION
GRADE 12

2023

GEOGRAPHY

TIME: **3 hours**

MARKS: **150**

20 pages

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS:

   SECTION A:
   QUESTION 1: Climate and Weather (40)
   QUESTION 2: Geomorphology (40)
   QUESTION 3: Settlement Geography (40)

   SECTION B:
   QUESTION 4: Geographical Skills and Techniques (30)

2. Answer ALL FOUR questions.

3. All diagrams are included in the QUESTION PAPER.

4. Leave a line open between sub-sections of questions answered.

5. Start EACH question at the top of a NEW page.

6. Number the answers correctly according to the numbering system used in this question paper.

7. Do NOT write in the margins of the ANSWER BOOK.

8. Draw fully-labelled diagrams when instructed to do so.

9. Answer in FULL SENTENCES, except when you have to state, name, identify or list.

10. Units of measurement MUST be indicated in your final answer, e.g., 1 020 hPa, 14 °C and 45 m.

11. You may use a non-programmable calculator.

12. You may use a magnifying glass.

13. Write neatly and legibly.

SPECIFIC INSTRUCTIONS AND INFORMATION FOR SECTION B

14. A 1 : 50 000 topographic map 2820 CB Augrabies and a 1 : 10 000 orthophoto map 3025AD 01 are provided.

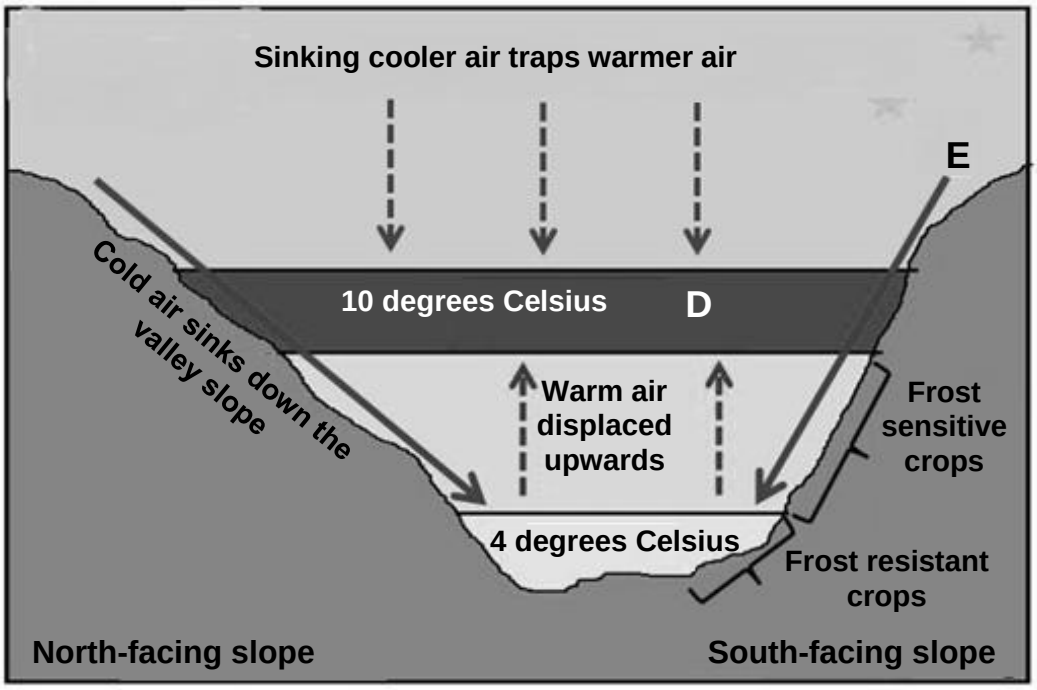
15. Show ALL calculations. Marks will be allocated for this.

16. You must hand in the topographic and the orthophoto maps back to the invigilator at the end of this examination session.

SECTION A: CLIMATE AND WEATHER, GEOMORPHOLOGY AND SETTLEMENT GEOGRAPHY

QUESTION 1: CLIMATE AND WEATHER

1.1 Refer to the diagram below which depicts a valley in the Southern Hemisphere. Choose a term from COLUMN B that matches the description in COLUMN A. Write only the letter (X or Y) next to the question numbers (1.1.1 to 1.1.5) in the ANSWER BOOK, for example 1.1.6 X.

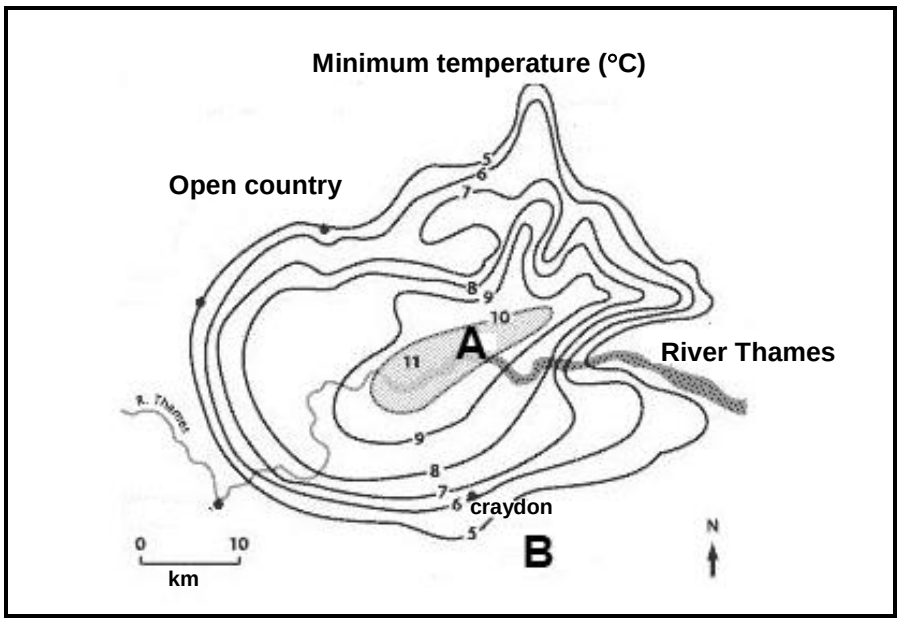


[Source: https://online.htseden.co.za/wp-content/uploads/2021/03/Geography-Grade-12-Term-1-Week-4_2021-1.pdf]

COLUMN A		COLUMN B	
1.1.1	The area marked **D** is the …	**X** **Y**	thermal belt layer of fog
1.1.2	The … slope is cooler in this valley.	**X** **Y**	north-facing slope south-facing slope
1.1.3	The wind blowing at **E** generally occurs during the …	**X** **Y**	day night
1.1.4	The temperature at **D** is higher because of …	**X** **Y**	temperature inversion anabatic winds
1.1.5	Frost pockets develop on the … of the valley	**X** **Y**	floor slopes

(5 x 1) (5)

1.2 Refer to the isotherm map below of an urban area showing the pattern of temperature during calm atmospheric conditions. Choose the correct letter (**A** or **B**) from FIGURE 1.2 to make the statement true.



[Source: https://www.coolgeography.co.uk/A-level/AQA/Year%2013/Weather%20and%20climate/Microclimates/Urban_climates.htm]

1.2.1 Air temperature is highest at (**A**/**B**).

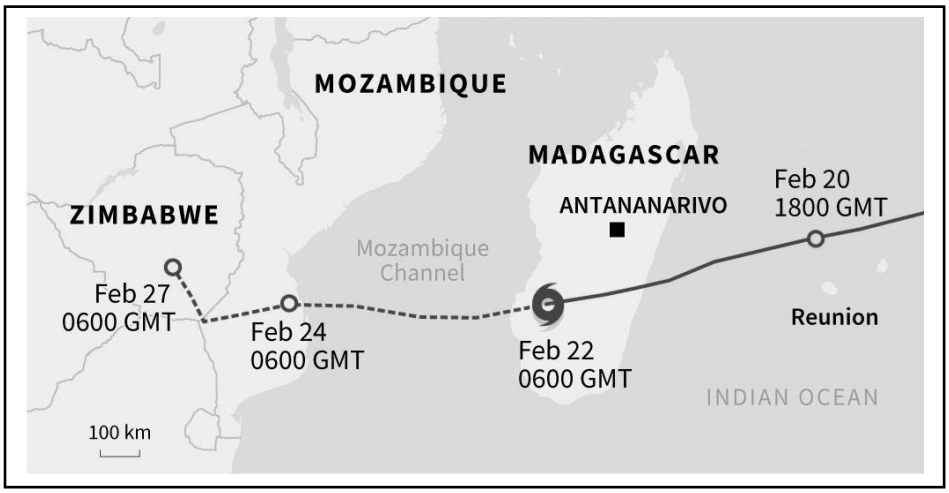
1.2.2 Area (**A**/**B**) has more artificial surfaces.

1.2.3 The city centre is at (**A**/**B**).

1.2.4 Cloud cover is higher (more) at (**A**/**B**).

1.2.5 The River Thames has a cooling effect on (**A**/**B**). (5 x 1) (5)

1.3 Refer to the infographic below showing information on Tropical Cyclone Freddy.



[Source: https://phys.org/news/2023-02-cyclone-freddy-mozambique-madagascar.html]



[Source: https://www.news24.com/news24/africa/news/death-toll-from-cyclone-freddys-return-rises-to-8-in-madagascar-20230307]

CYCLONE FREDDY

ONE of the longest-lasting weather systems in the southern hemisphere, ex-tropical cyclone Freddy, is expected to bring heavy rain and a risk of flooding to Madagascar's western and southern parts from tomorrow (Friday) evening.

Freddy weakened from an intense category 4 equivalent into a category 3 cyclone ahead of landfall on the eastern Malagasy coast near the town of Mananjary during the evening of 21 February, with sustained wind speeds of 150 km/h. All eyes are once again on Freddy, currently classified as a tropical depression, as the system is expected to re-intensify in the Mozambique Channel.

[Source: adapted from OCHA SOUTHERN AFRICA: Tropical Cyclone Freddy Flash Update No. 4 01 March 2023]

1.3.1 With reference to the infographic, identify the general direction in which Cyclone Freddy is moving. (1 x 1) (1)

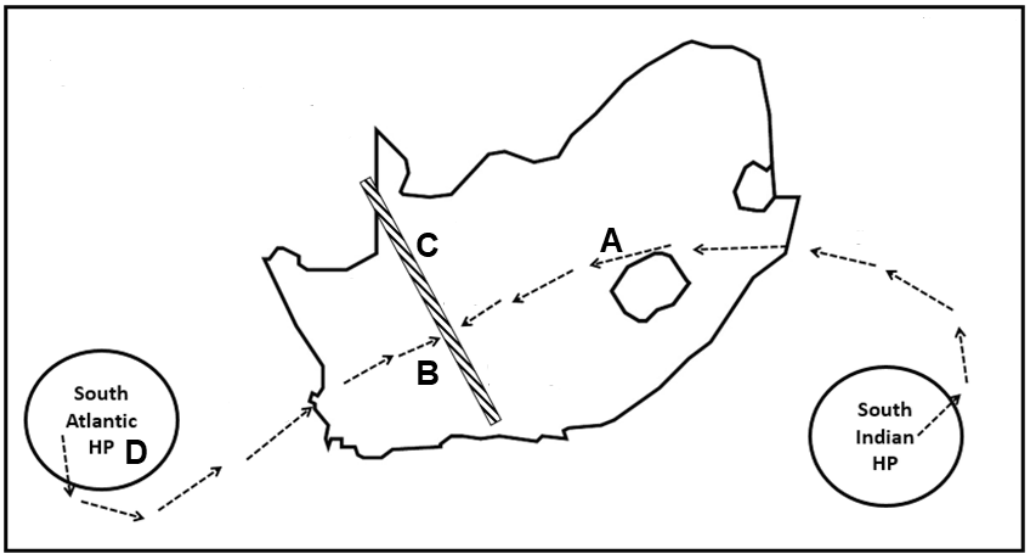
1.3.2 Account for the movement mentioned in QUESTION 1.3.1. (1 x 2) (2)

1.3.3 Give evidence from the infographic that Cyclone Freddy was accompanied by hurricane force winds. (1 x 2) (2)

1.3.4 According to the infographic the system is re-intensifying (getting stronger) in the Mozambique Channel. Explain why the weather system will re-intensify in the Mozambique channel. (2 x 2) (4)

1.3.5 Tropical cyclones can develop very quickly, therefore a reliable early warning system is important. Suggest THREE early warning systems that the governments of Mozambique and Madagascar could have introduced to reduce the impact of Cyclone Freddy. (3 x 2) (6)

1.4 Refer to the FIGURE below depicting the formation of line thunderstorms.



[Source: Adapted from: https://learn.mindset.africa/sites/default/files/resourcelib/emshare-show-note-asset/859_fdoc.pdf]

1.4.1 Name a characteristic of the air at **A**. (1 x 1) (1)

1.4.2 Name a characteristic of the air at **B**. (1 x 1) (1)

1.4.3 Describe how the air at **A** and at **B** contributed to the formation of the line at **C**. (2 x 2) (4)

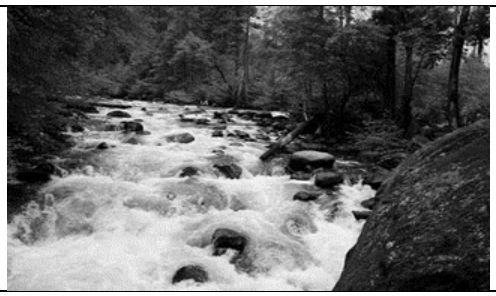
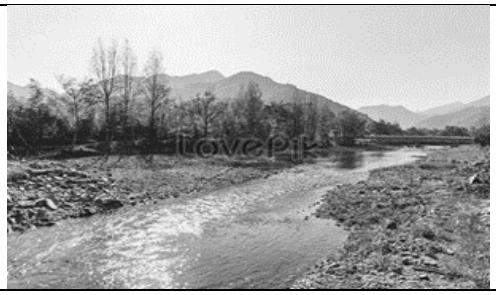
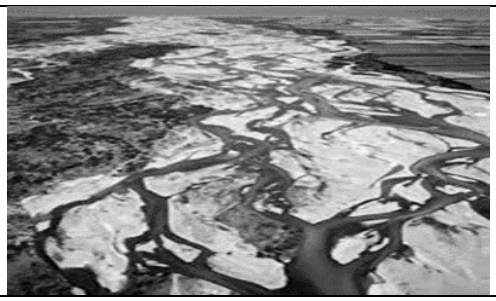
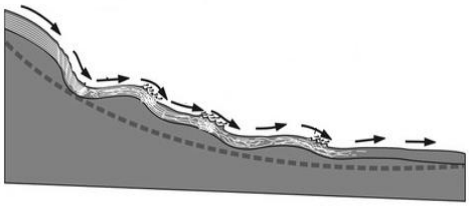
1.4.4 Which side (east/west) of the line at **C** will there be cloud formation? (1 x 1) (1)

1.4.5 In a paragraph of approximately EIGHT lines, discuss the negative impact of the line thunderstorm on the environment of the eastern half of South Africa. (4 x 2) (8)

[40]

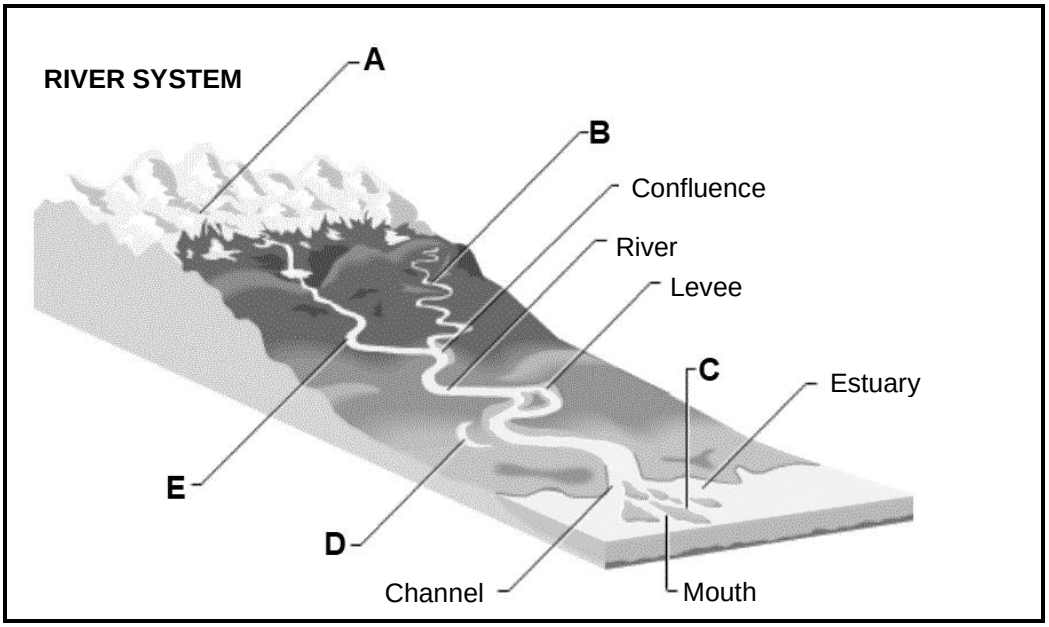
QUESTION 2: GEOMORPHOLOGY

Choose a term from COLUMN B that matches the illustration in COLUMN A. Write only the letter (X or Y) next to the question numbers (2.1.1 to 2.1.5) in the ANSWER BOOK, for example 2.1.6 X.

COLUMN A		COLUMN B	
2.1.1		**X** **Y**	Cross profile of a river Longitudinal profile of a river
2.1.2		**X** **Y**	Waterfall Rapids
2.1.3		**X** **Y**	Turbulent river flow Laminar river flow
2.1.4		**X** **Y**	Braided stream Delta
2.1.5		**X** **Y**	Graded river profile Ungraded river profile

(5 x 1) (5)

2.2 Refer to the FIGURE below illustrating fluvial landforms of a river. Match the description with A – E on the diagram. Write down only the question numbers (2.2.1 to 2.2.5) and the answer in your ANSWER BOOK. E.g., 2.2.6 F.



[Source: https://lotusarise.com/fluvial-landforms-upsc/]

2.2.1 The origin of the river

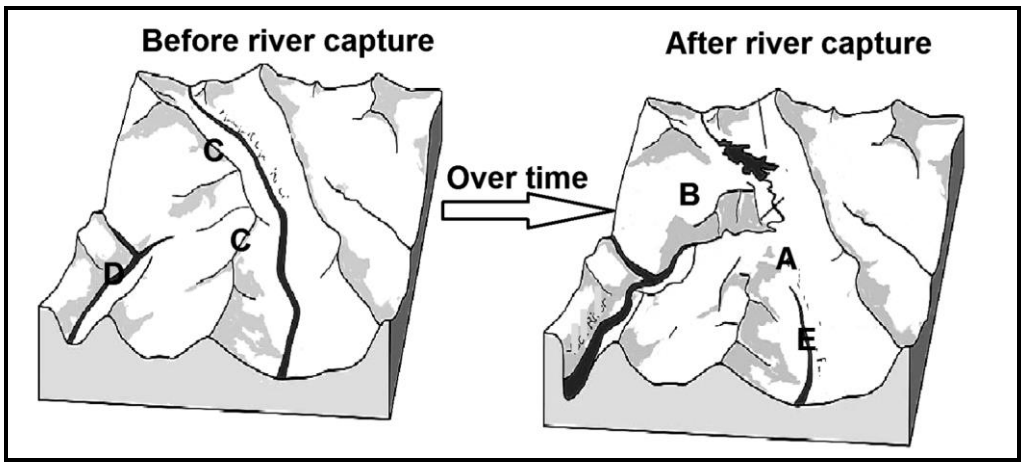
2.2.2 Cut-off meander loop filled with water

2.2.3 A distinct curve or loop in the course of the river channel

2.2.4 The branch of the main river

2.2.5 Depositional feature close to the mouth of the river (5 x 1) (5)

2.3 Refer to the FIGURE below which shows river capture.



[Source: https://www.awsumnews.co.za/wp-content/uploads/2020/01/GEOGRAPHY-P1-GR12-ANNEX-SEPT2017_English.pdf]

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

2.3.2 Identify the drainage basin feature labelled **C**. (1 x 1) (1)

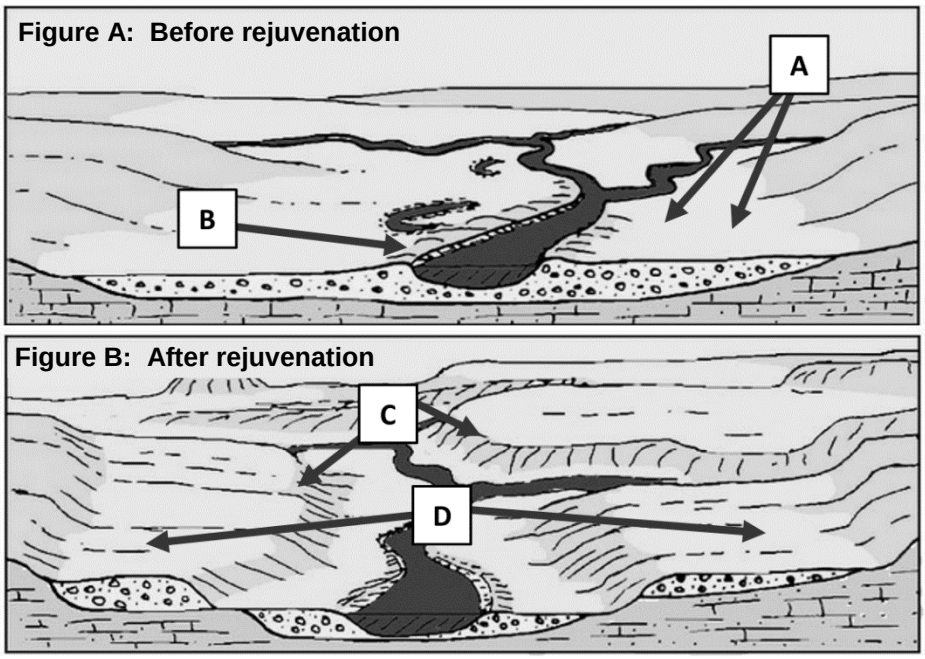
2.3.3 Identify the type of erosion taking place at **B**. (1 x 1) (1)

2.3.4 Name the features of river capture marked **A**, **D** and **E**. (3 x 1) (3)

2.3.5 Discuss ONE possible climatological reason why river capture has taken place. (1 x 2) (2)

2.3.6 Discuss the impact of river capture on the flow characteristics of the stream labelled **E**. (3 x 2) (6)

2.4 Study the FIGURE below showing river rejuvenation.



[Source: https://www.studyclix.ie/leaving-certificate/geography/higher/rivers/study-this-topic]

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

2.4.2 Name the fluvial landforms at **A** and **B**. (2 x 1) (2)

2.4.3 Feature **D** in FIGURE B indicates rejuvenation. Name feature **D**. (1 x 1) (1)

2.4.4 Give TWO reasons for rejuvenation. (2 x 2) (4)

2.4.5 Explain how rejuvenation will affect the flow of the river downstream. (3 x 2) (6)

[40]

QUESTION 3: SETTLEMENT GEOGRAPHY

3.1 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 (3.1.1 to 3.1.5) in the ANSWER BOOK, e.g., 3.1.6 A.

3.1.1 The … is the actual place/piece of land on which a settlement is built.

A site
B situation
C dry point settlement
D wet point settlement

3.1.2 A … settlement is where water is the determining factor when choosing a site as it is located in a dry area, e.g., spring, oasis.

A dry point
B wet point
C nucleated
D dispersed

3.1.3 The sketch below refers to a … settlement.

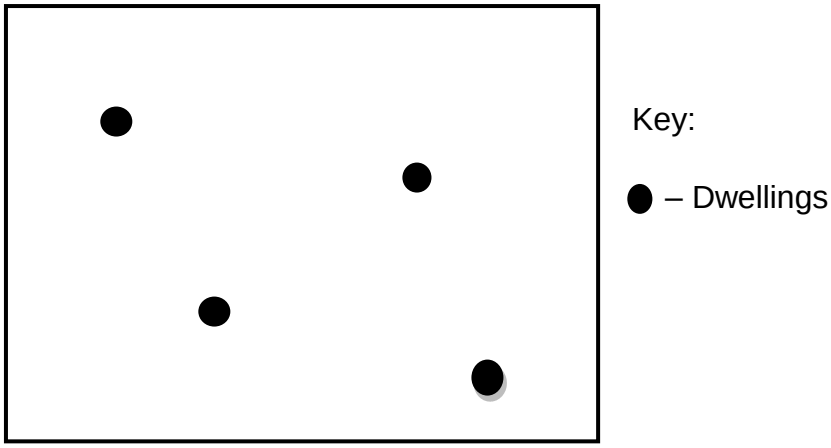


Key:

■ – Dwellings

A round
B linear
C straight
D semi circular

3.1.4 The disadvantages of the rural settlement pattern below are …



(i) that farmers cannot rely on the community for any help
(ii) that it requires a large amount of capital to maintain the farming practices
(iii) that people feel safer
(iv) the sharing of farming implements

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

3.1.5 The situation of a settlement can be influenced by …

(i) transport routes
(ii) aspect
(iii) availability of water
(iv) grazing land

A (i) and (ii)
B (iii) and (iv)
C (i) and (iv)
D (i) and (iii) (5 x 1) (5)

3.2 Choose a description from COLUMN B that matches the concept in COLUMN A. Write only the letter (X or Y) next to the question numbers (3.2.1 to 3.2.5) in the ANSWER BOOK, for example 3.2.6 X.

COLUMN A	COLUMN B	
3.2.1 Level of urbanisation	**X**	Percentage of the number of people living in urban areas
	Y	Increase in the number of people living in urban areas
3.2.2 Urban sprawl	**X**	The physical expansion of an urban area
	Y	The formless expansion of an urban area
3.2.3 Central Places	**X**	Refers to the physical expansion of an urban area
	Y	These towns develop due to one main function
3.2.4 Threshold Population	**X**	The minimum number of people necessary before a particular good or service can be provided in an area
	Y	The area served by a particular settlement
3.2.5 Counter-urbanisation	**X**	People moving from urban areas into surrounding rural areas
	Y	People moving from rural areas to urban areas

(5 x 1) (5)

3.3 Refer to the article below and answer the questions that follow.

Water access to rural communities in South-Africa

Due to a lack of water infrastructure in rural settlements, 74 percent of all rural people are entirely dependent upon groundwater (i.e., local wells and pumps). Due to immigration and population growth, the growth in rural settlements is placing further stress on South Africa's water supply. Currently, 19 percent of the rural population lacks access to a reliable water supply and 33 percent does not have basic sanitation services.

Lack of water infrastructure and the ineffective maintenance of existing water infrastructure in rural communities is at the heart of the water problem.

[Source: Adapted from MiT Education]

3.3.1 According to the article, from where do most rural people get their water? (1 x 1) (1)

3.3.2 What percentage of rural communities lack access to a reliable water source? (1 x 1) (1)

3.3.3 Quote another service delivery issue (other than the lack of access to water) mentioned in the article above. (1 x 1) (1)

3.3.4 With reference to the article, identify the main causes of the water problem in rural communities. (1 x 2) (2)

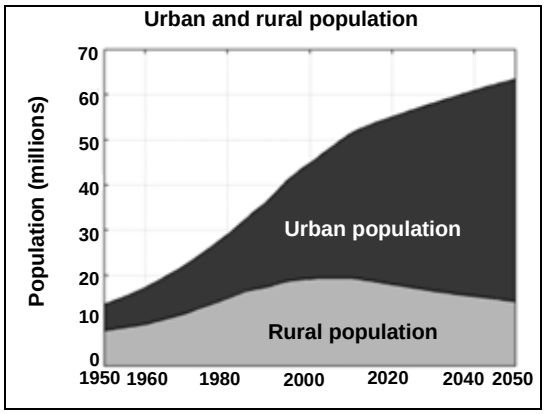
3.3.5 Suggest TWO sustainable solutions that the government can introduce to overcome the lack of access to water in rural communities. (2 x 2) (4)

3.3.6 Discuss how the lack of access to water will impact on the economy of rural communities. (3 x 2) (6)

3.4 Refer to the infographic below that depicts an urban issue in South Africa.



[Source: The Globe and Mail]



[Source: https://businesstech.co.za/news/trending/62749/sa-population-flocking-to-cities/]

President Cyril Ramaphosa recently added his voice to calls to address the severe decay of historical inner cities in most of the country's major cities and towns. Cape Town may be doing slightly better than other large South African cities – which is accredited to progressive inner-city governance, city improvement districts and the active municipal problem building unit – there are however still challenges to overcome. One is 10 Wright Street, Woodstock, a deteriorating building that is being occupied illegally by close to 200 people. It is an arduous process to vacate them so that the building can be sold and repaired or demolished to make way for a new development.

Ineffective waste management by municipalities and inadequate crime management programmes add to the filth and chaos in urban areas.

[Source: Adapted from Reversing inner-city decay, Hendrik Conradie, 29 Nov 2020 City Press]

3.4.1 Identify the urban issue highlighted in the picture in the infographic. (1 x 1) (1)

3.4.2 According to the article, identify one challenge experienced in trying to repair deteriorating buildings. (1 x 1) (1)

3.4.3 Identify TWO other urban issues mentioned in the article. (2 x 1) (2)

3.4.4 With reference to the graph in the infographic, identify the trend in urban growth from 1950 to 2020. (1 x 1) (1)

3.4.5 Identify the relationship between the urban population and the urban issue (the answer to QUESTION 3.4.1) as shown in the picture and graph in the infographic. (1 x 2) (2)

3.4.6 In a paragraph of approximately EIGHT lines, discuss the impact that the urban issue referred to in QUESTION 3.4.1 will have on the people in urban areas. (4 x 2) (8)

[40]

TOTAL SECTION A: 120

SECTION B

QUESTION 4: GEOGRAPHICAL SKILLS AND TECHNIQUES

BACKGROUND INFORMATION ON AUGRABIES



Co-ordinates: 28°35'S ; 20°20'E

Augrabies is a small town in the Northern Cape province of South Africa, situated on the south bank of the Orange River about 100 kilometres downstream from Upington. It is located on the R359 road just outside the Augrabies Falls National Park, which contains the Augrabies Falls for which the town is named.

[Source: https://en.wikipedia.org/wiki/Augrabies,_Northern_Cape]

The following English terms with Afrikaans translations are shown on the topographic and orthophoto maps:

ENGLISH	***AFRIKAANS***
Holiday Resort	*Vakansie-oord*
Island	*Eiland*
National Park	*Nasionale park*
Mission Station	*Sendingstasie*

4.1 MAP SKILLS AND CALCULATIONS

4.1.1 The feature found at grid location 28°36'13"S; 20°20'27"E is (a/an) …

A spot height.
B orchard and vineyards.
C row of trees.
D ruin. (1 x 1) (1)

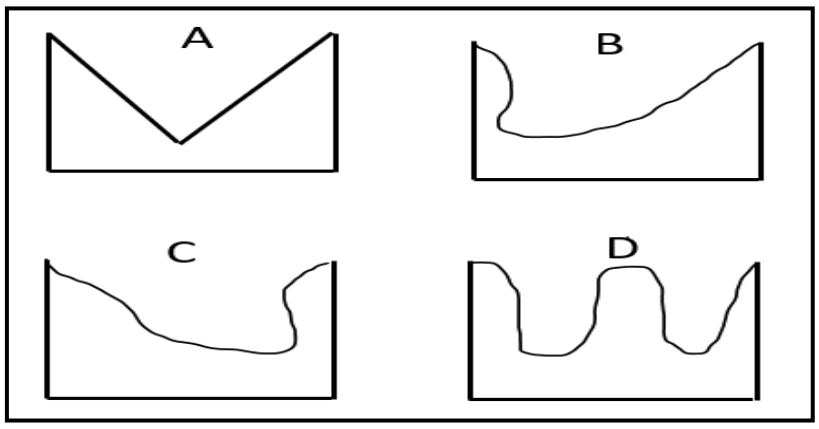
4.1.2 Augrabies is situated ...

(i) in the Western Cape Province.
(ii) in the Northern Cape Province.
(iii) upstream of Upington.
(iv) downstream of Upington.

Choose the correct combination.

A (i) and (ii)
B (ii) and (iii)
C (ii) and (iv)
D (i) and (iii) (1 x 1) (1)

4.1.3 Choose the likely rough cross-section from **6** to **7** on the orthophoto map.



(1 x 1) (1)

4.1.4 Determine the magnetic bearing from the trigonometrical station 74 (block **E4**) to spot height 652 (block **C5**). Show ALL calculations. Marks will be awarded for calculations.

Formula: Magnetic bearing = True bearing + Magnetic declination

(3 x 1) (3)

4.1.5 Refer to line **8** on the orthophoto map. The vertical interval of line **8** is 4 metres.

(a) What is the horizontal equivalent (HE) of line **8**? (2 x 1) (2)

(b) Calculate the average gradient of line **8**, by using the information of QUESTION 4.1.5(a).

Formula – Average gradient = $\frac{\text{Vertical interval (VI)}}{\text{Horizontal equivalent (HE)}}$

(2 x 1) (2)

4.2 MAP INTERPRETATION

4.2.1 The general wind direction in the area covered by block **B4** on the topographic map is …

A south west.
B south east.
C north west.
D north east. (1 x 1) (1)

4.2.2 The islands indicated by **G** on the topographic map, are caused by … and …

(i) silting.
(ii) braiding.
(iii) erosion.
(iv) weathering.

Choose the correct combination.

A (i) and (ii)
B (ii) and (iii)
C (iii) and (iv)
D (i) and (iii) (1 x 1) (1)

4.2.3 The type of settlement according to size and complexity at **F** in block **E1** on the topographic map, is a …

A hamlet.
B town.
C dispersed settlement.
D nucleated settlement. (1 x 1) (1)

4.2.4 Refer to the fluvial landform found between blocks **B1** and **C3** on the orthophoto map.

(a) Identify this fluvial landform. (1 x 1) (1)

(b) Describe the slopes of this landform (answer to QUESTION 4.2.4(a)) by referring to evidence on the orthophoto map. (1 x 2) (2)

(c) Will the Augrabies Waterfall at **9**, retreat in a south easterly or north westerly direction? Give a reason for your choice. (1 + 1) (2)

4.2.5 Refer to the settlement at **H** on the topographic map.

(a) Identify the pattern of the settlement at **H**. (1 x 1) (1)

(b) What is the shape of this settlement at **H**? (1 x 1) (1)

(c) Explain ONE factor that influenced the pattern of this settlement at **H**. (1 x 2) (2)

4.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

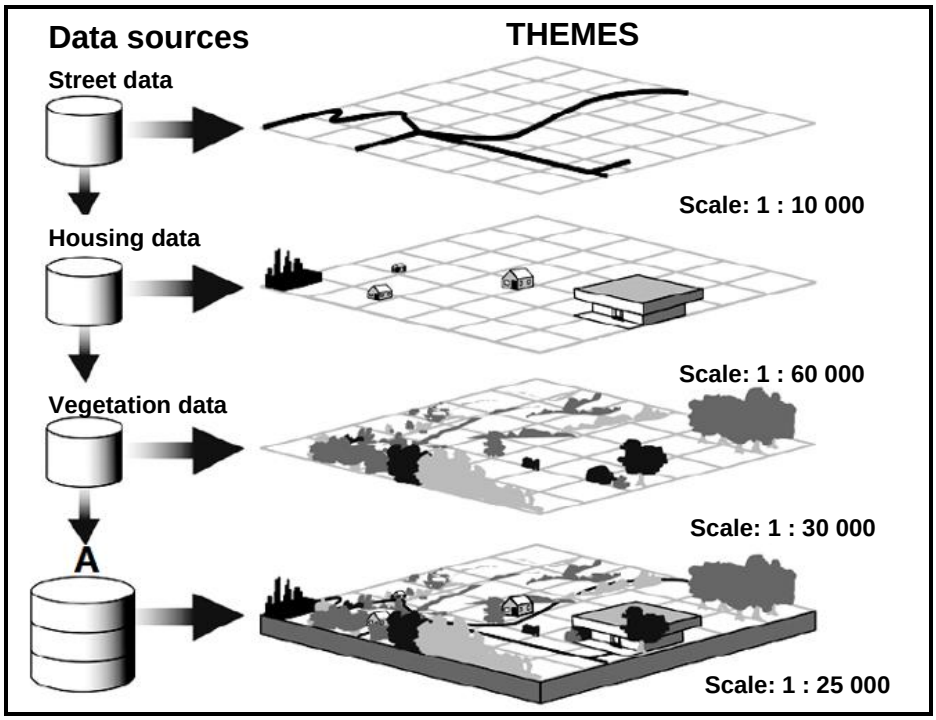
4.3.1 The data layers found in block **A4** on the orthophoto map are ...

(i) drainage.
(ii) infrastructure.
(iii) relief/topography.
(iv) transport.

Choose the correct combination.

A (i) and (ii)
B (ii) and (iii)
C (iii) and (iv)
D (i) and (iii) (1 x 1) (1)

4.3.2 Refer to the sketch illustrating a GIS process.



[Source: https://www.google.com/search?qgis&rlz=1C1GCEU]

(a) Name the GIS process illustrated by **A**. (1 x 1) (1)
(b) Explain the GIS process named in QUESTION 4.3.2(a). (1 x 2) (2)

4.3.3 Name the polygon feature in block **E2** on the topographic map. (1 x 1) (1)

4.3.4 Is the polygon feature named in QUESTION 4.3.3, raster or vector data? (1 x 1) (1)

4.3.5 Comment on the importance of the polygon feature (named in QUESTION 4.3.3) for the residents of the Brabeesmond settlement. (1 x 2) (2)

[30]

TOTAL SECTION B: 30
TOTAL 150