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NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2018

GEOGRAPHY: PAPER I

Time: 3 hours | 300 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 22 pages, a Colour Insert of 4 pages (i–iv) and an Answer Sheet of 4 pages (i–iv). Detach the Colour Insert and Answer Sheet from the middle of the question paper. Please check that your question paper is complete.

2. Read the questions carefully.

3. **ALL THREE QUESTIONS ARE COMPULSORY.**

4. Credit will be awarded for the following:
   - interpretation and explanation; and
   - evidence of personal observations where this is appropriate to the question.

5. You are encouraged to use sketch maps, diagrams and other explanatory drawings to support your answers wherever relevant.

6. It is in your own interest to write legibly and to present your work neatly.

7. There is a GLOSSARY of words on page 2 explaining the meaning of the words in bold that are used in the questions.

8. Candidates must pay attention to the mark allocation. Unless otherwise indicated, two marks are awarded for a valid response. This means that a question carrying four marks requires two responses.

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GLOSSARY

WORD	MEANING
Account for	To justify and provide reasons for something using a short explanation.
Analyse	To separate into parts or elements and to describe or examine each in detail.
Assess	To evaluate or estimate the nature, ability, or quality of.
Calculate	To work out the value of something using a mathematical method.
Classify	To divide into groups or types so that things with similar characteristics are in the same group.
Comment	To give your opinion or make a statement about something; to write generally about.
Define	To give the precise meaning of ...
Describe	To provide the main characteristics of something; to provide an account of. (Note: A diagram or map may be included as part of a description.)
Design	To explain step by step a process or plan of action.
Determine	To discover as a result of an investigation.
Discuss	To examine or investigate by way of an argument the various aspects of a statement.
Draw	To show by means of a sketch.
Elaborate	To write about something in depth, with much attention to the detail of the different parts making up the whole.
Evaluate	To judge or determine, to provide an opinion on a particular matter.
Examine	To analyse and to discuss; to look at something carefully.
Explain	To make clear or plain or to make sure that the reader understands what is being said.
Explore	To comment on something in detail.
Identify	To give the essential characteristics of something.
Illustrate	To make clear or intelligible, as by examples or analogies; exemplify.
Indicate	To point out or show.
Match	To connect similar things or things that belong together.
Name	To state something; to give; to mention.
Outline	To provide a general explanation or description of something.
Predict	To say what is expected to happen; to foretell; to say in advance.
Select	To choose; to pick out the correct answer from several alternatives.
State	To present information or details plainly, directly, and simply, without discussion.
Suggest	To propose an explanation or solution by way of a plan or suggestion.

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SECTION A GEOGRAPHICAL ISSUES

QUESTION 1 GEOGRAPHICAL CASE STUDY: THE GEOGRAPHY OF THE ORANGE / SENQU RIVER BASIN AND THE NORTHERN CAPE

1.1 Catchment and river management

Study Table 1, which contains information on the Orange River catchment area, and Figure 1, a longitudinal profile of the Orange River, and Figure 2, a map of the Orange River basin.

Table 1: Information for the Orange / Senqu River catchment areas

ORANGE / SENQU RIVER BASIN INFORMATION		
Size of catchment area	1 000 000 km^2 (almost 600 000 km^2 are within the borders of South Africa)	
Total length of the river	2 300 km	
Average natural run-off	12 billion m^3 This value can, however, be very misleading since the basin is now heavily developed with the result that the current average annual run-off reaching the river mouth at Alexander Bay is less than half of the natural run-off.	
	Source	**Mouth**
Location	Lesotho Highlands	Alexander Bay
Altitude above sea level	3 300 m	Atlantic Ocean
Average annual precipitation	1 800 mm	< 50 mm
Average annual potential evaporation	1 100 mm	> 3 000 mm
OTHER IMPORTANT INFORMATION		
• The Vaal River is the largest of the Orange River's tributaries. • The Richtersveld is an area between Augrabies Falls and the mouth of the Orange River. • The Orange River has unearthed a landscape millions of years old. • As the river flows through the Richtersveld it has an antecedent drainage pattern.		

Figure 1: Longitudinal profile of the Orange River

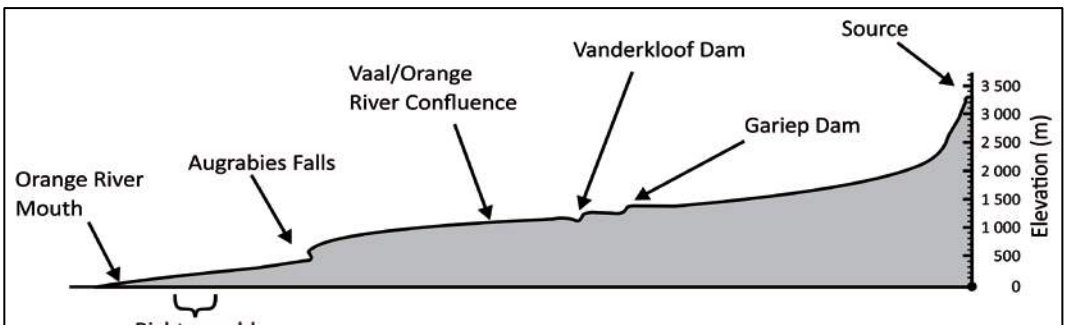

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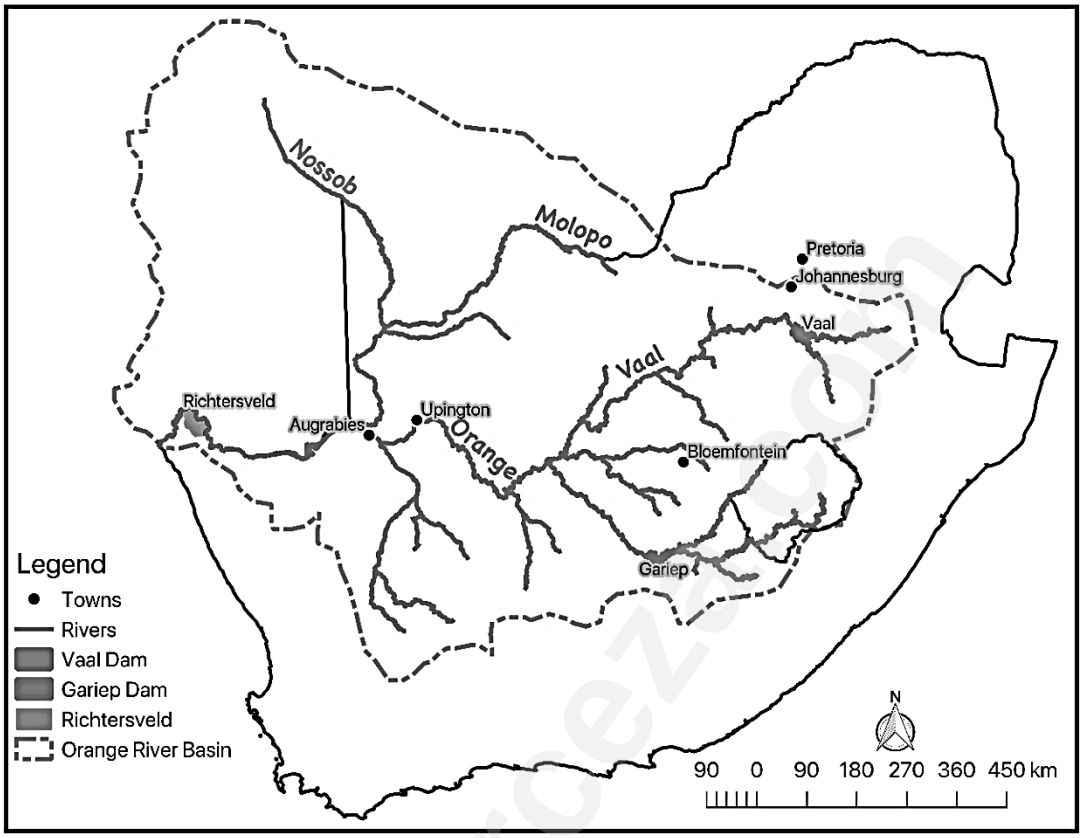
Figure 2: The Orange River catchment area



[Source: adapted from the Department of Water and Sanitation]

(a) **Explain** the terms:

(i) catchment area (2)

(ii) potential evaporation (2)

(b) Use the information in Table 1 and Figure 1, to **determine** the approximate gradient of the Orange River from its source to its mouth. Show all calculations. (4)

(c) **Name** one constructed knickpoint and one natural knickpoint. (4)

(d) **Explain** the term rejuvenation. (2)

(e) **Comment** on why the Orange River would not be regarded as graded. (4)

(f) With the aid of a diagram, **describe** how an antecedent drainage pattern is formed. (6)

(g) **Assess** why the amount of rainfall decreases from the eastern part of the Orange River catchment area to the western part of the catchment area. (4)

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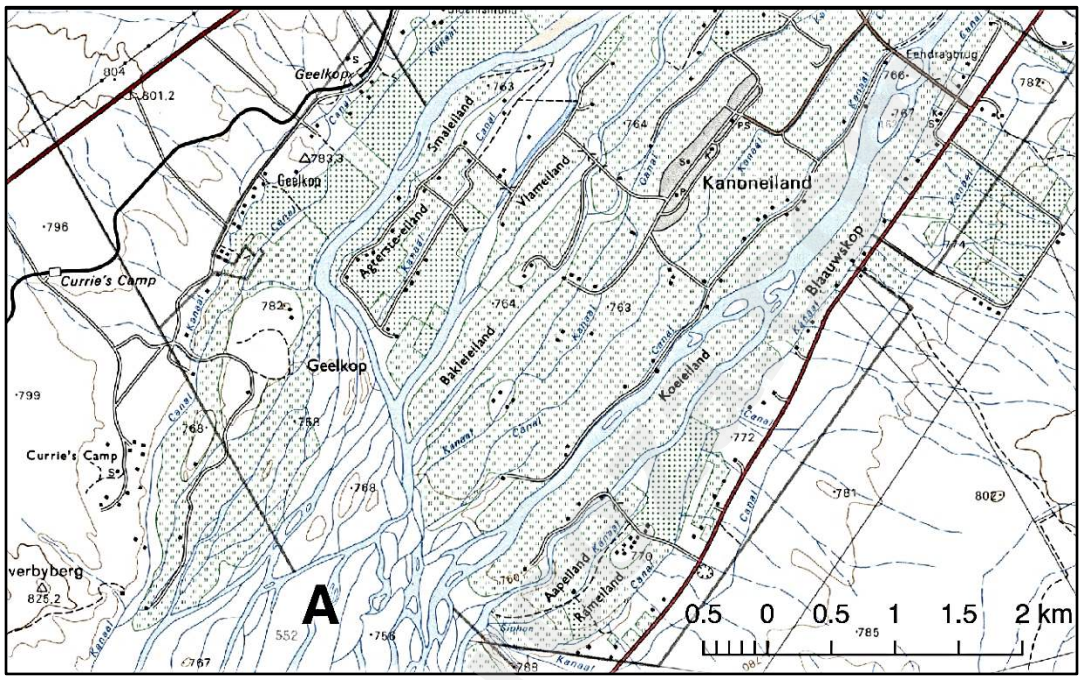
1.2 Settlement and fluvial processes

Study Photograph 1 on page i of the Colour Insert and Figure 3 below of the settlement of Kanoneiland.

Figure 3: Topographic map extract of Kanoneiland



[Extract from 2821 CA Kanoneiland]

(a) **Identify** and **account for** the shape of the Kanoneiland settlement as seen in Figure 3 and Photograph 1. (4)

(b) **Describe** the <u>site</u> of the settlement. (4)

(c) **Analyse** whether the settlement is a dry-point or wet-point settlement. (4)

(d) **Examine** why this settlement would be regarded as a "village" in terms of urban hierarchy. (4)

(e) **Identify** the stream channel pattern of the Orange River at point A on Figure 3. (2)

(f) **Explain** the formation of the stream channel pattern at A in Figure 3. (2)

(g) **Discuss** how alluvial deposits, like the ones found at A in Figure 3, have influenced the growth and development of the local economy. (4)

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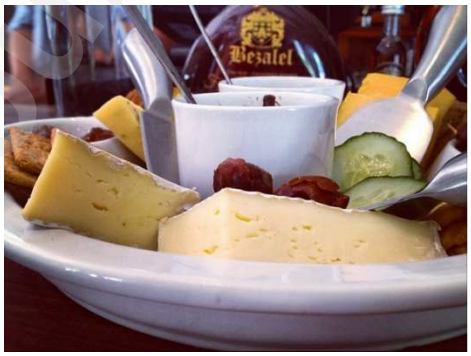
1.3 Agriculture and valley climates

Read the fact file extract on wine farming in Kanoneiland and along the Orange River in the Upington area.

Fact File: Kanoneiland, Upington and Orange River Wines

- Outside Upington on the Orange River, Kanoneiland is the largest inhabited inland island in South Africa.
- This is a fascinating stopover en route to Augrabies or the Kgalagadi.
- One can enjoy a drive between the many vineyards, a spit-roast, home-baked bread, several traditional desserts and locally produced wines.
- The closest large settlement to Kanoneiland is Upington along the Orange River.
- Today the main crop is grapes – mostly sultanas for raisins (and some Colombard for wine), while lucerne, pecan nuts and cotton are also cultivated.
- Orange River Wine Cellars is situated in South Africa's – and possibly the world's – most unusual wine-growing region.
- A large agritourism industry has grown in recent times.
- The river, which creates a cool enough micro-climate, and the type of soil along its banks (a combination of alluvial deposits, granite, dolerite and shale) result in the production of quality grapes.



[Source: discoversouthafrica and Country Life]
[<https://www.sa-venues.com>]
[<http://www.openafrica.org>]

(a) **Classify** viticulture[1] into an economic sector. (2)

(b) **Explain** how the river valley would affect the location of vineyards along the Orange River. (4)

(c) **Predict** TWO factors other than the arid climate that would hinder wine farming in this region. (4)

(d) Many wine farmers in South Africa have moved into agritourism. **Assess** why rural redevelopment is important to the survival of rural communities like Kanoneiland. (6)

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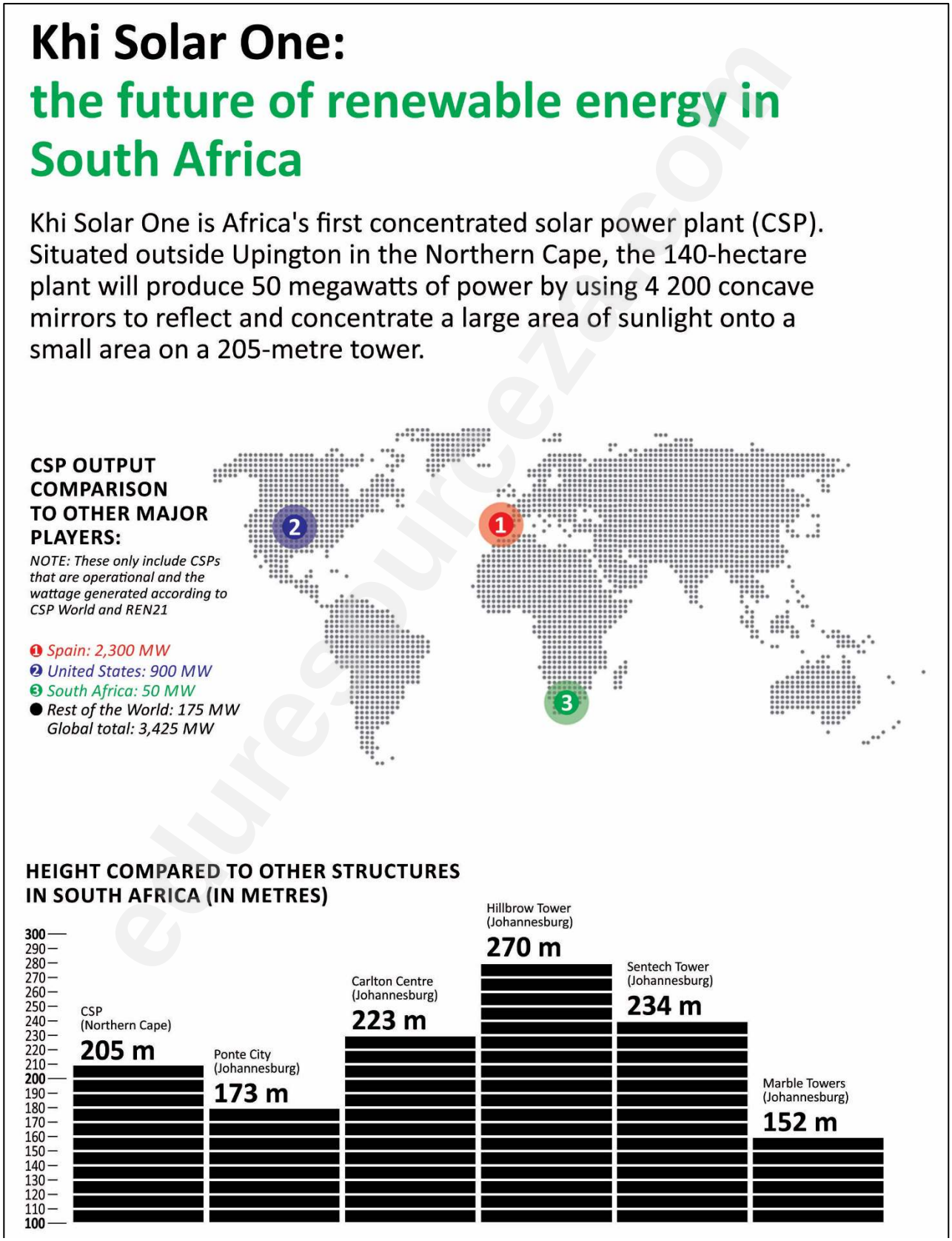
1.4 **Khi Solar One post-apartheid economic development project**

Study the infographic Figure 4, below, about the Khi solar power plant near Upington in the Northern Cape.

Figure 4: Infographic about the Khi Solar One power station



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(a) **Define** the term renewable energy. (2)

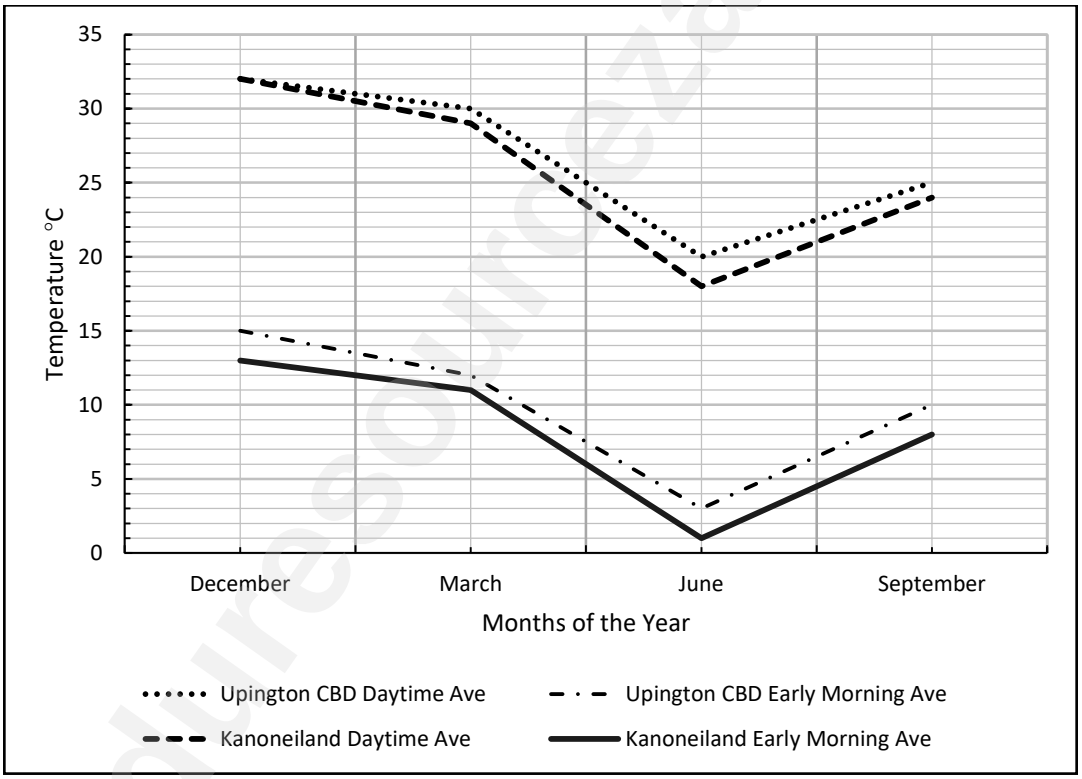
(b) **Explain** why the Northern Cape is an ideal location for solar power. (4)

(c) **Evaluate** how a post-apartheid development strategy like this project will benefit the people in a region like Upington socio-economically. (6)

1.5 Urban climates

As part of a field study, you collected data on the effect of an Urban Heat Island (UHI) in the region around Kanoneiland and Upington. The graph below (in Figure 5) shows the readings collected at Kanoneiland and in the Upington CBD respectively. A location map, Figure 6 on page i of the Colour Insert, will help you with the positioning of the two settlements.

Figure 5: Graph showing temperature data for Kanoneiland and Upington



Write a report for the South African Weather Service in which you discuss the findings from your research. Explain how the sprawl of the urban areas affects the climate of a region, in particular, urban areas versus rural areas.

In your report you must cover the following aspects:

- **Outline** the observed temperature variation (rural vs urban).
- **Describe** possible causes of heat in an urban area.
- **Evaluate** how the UHI has exacerbated[2] the temperatures felt in urban areas such as Upington.
- **Explore** solutions that urban areas such as Upington could implement to reduce the UHI effect. (20)

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Note: you may draw on any examples you have studied to support your discussion. Use the rubric below to guide the planning and structure of your report.

CRITERIA	MARKS
Writing skills • Taking into consideration structure and presentation. • Use of brief introduction and conclusion. • Logical discussion and use of subheadings.	**5**
Content knowledge • Correct use of geographical terminology and concepts. • Adherence to topic and sub-headings.	**10**
Supporting evidence – analysis and understanding • The ability to analyse and evaluate the topic is assessed in this category. • Reference made to case study material / fact file / source material provided. • If appropriate, reference must be made to familiar / local or other examples.	**5**
Total for essay	**20**

100 marks

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SECTION B **CLIMATE, WEATHER AND GEOMORPHOLOGY**

QUESTION 2 **MID-LATITUDE CYCLONE, TROPICAL CYCLONE, LOCAL WEATHER, RIVER BASIN STUDY, RIVER CHANNEL AND FEATURES, DROUGHT**

2.1 **Mid-latitude cyclone**

Study Figure 7 on page ii of the Colour Insert, a thematic weather map.

Select the correct answer to the statement given. Write the number and letter of the question and the letter corresponding to your answer. Example 2.1 (a) A

(a) The dashed lines in Figure 7 are called …

A isobars.
B isohyets.
C isohels.
D isotherms. (2)

(b) The region where you find the coldest temperatures in a mid-latitude cyclone is the …

A cold sector.
B cold front.
C warm sector.
D warm front. (2)

(c) The anticyclone visible in Figure 7 is called …

A Kalahari / interior anticyclone.
B South Atlantic anticyclone.
C South Indian anticyclone.
D Karoo / Cape anticyclone. (2)

(d) The term used to describe the change in wind direction as a cold front passes in the southern hemisphere is …

A backing.
B veering.
C crosswind.
D South Easter. (2)

(e) The weather Cape Town will experience in the next 24 hours will be …

A clear, warm with a light breeze.
B cool, northwesterly wind and partly cloudy.
C rainy, with a strong south-easterly wind.
D thunderstorms, with gale-force wind. (2)

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2.2 Tropical cyclones

Study Figure 8 on page ii of the Colour Insert, a weather report from eNCA.

(a) **Identify** point A marked on Figure 8. (2)

(b) **Name** two factors that would have aided Dineo's formation. (4)

(c) **State** the approximate wind speeds experienced at Inhambane and Vilanculos respectively, in km/h. (2)

(d) **Evaluate** why the inhabitants of Inhambane would have experienced Dineo as more severe than the people in Vilanculos would have. (4)

(e) **Evaluate** why storms like Dineo are so devastating for countries like Mozambique. (6)

2.3 Local weather

Study the two tweets in Figure 9A and Figure 9B below, as well as the synoptic weather map (Figure 10 on page 12) on the weather over the eastern part of South Africa on 9 and 10 October 2017.

Figure 9A

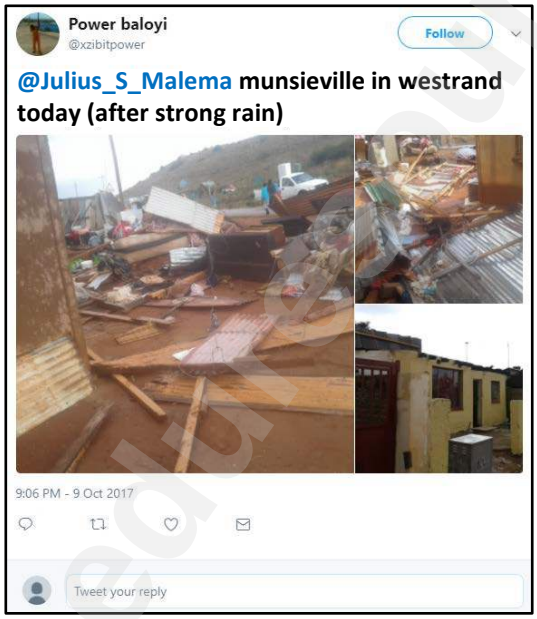
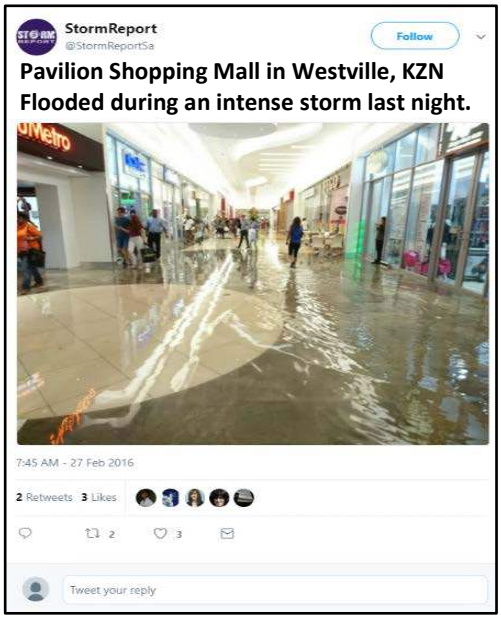


Figure 9B



[Source: Twitter, October 2017]

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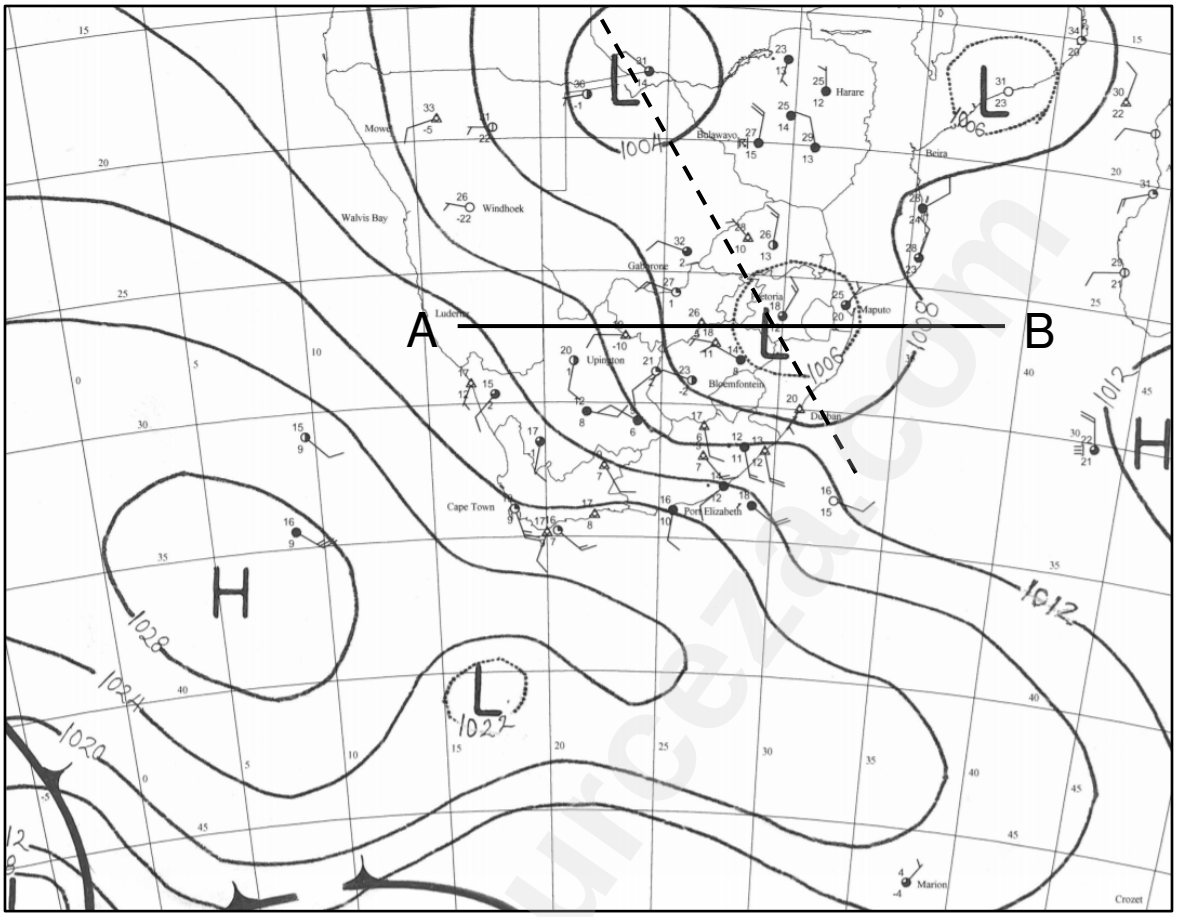
Figure 10: Synoptic weather map for 9 October 2017 (the dashed line indicates the moisture front).



[Source: South African Weather Service]

(a) **Name** a synoptic weather map feature responsible for the formation of line thunderstorms. (2)

(b) On the cross section of South Africa on page i of the Answer Sheet provided, **illustrate** how thunderstorms are formed over the interior of South Africa.

Include the following in your diagram:

- **Explain** how hail forms in these line thunderstorms.
- **Illustrate** why these thunderstorms form on the eastern side of the moisture front. (8)

(c) **Draw** a weather station symbol to describe the weather that Durban might experience during a cut-off low. (6)

(d) **Explore** how the mismanagement of urban storm-water drains in Durban and Johannesburg could have worsened the effects of the flood episode in these cities. (4)

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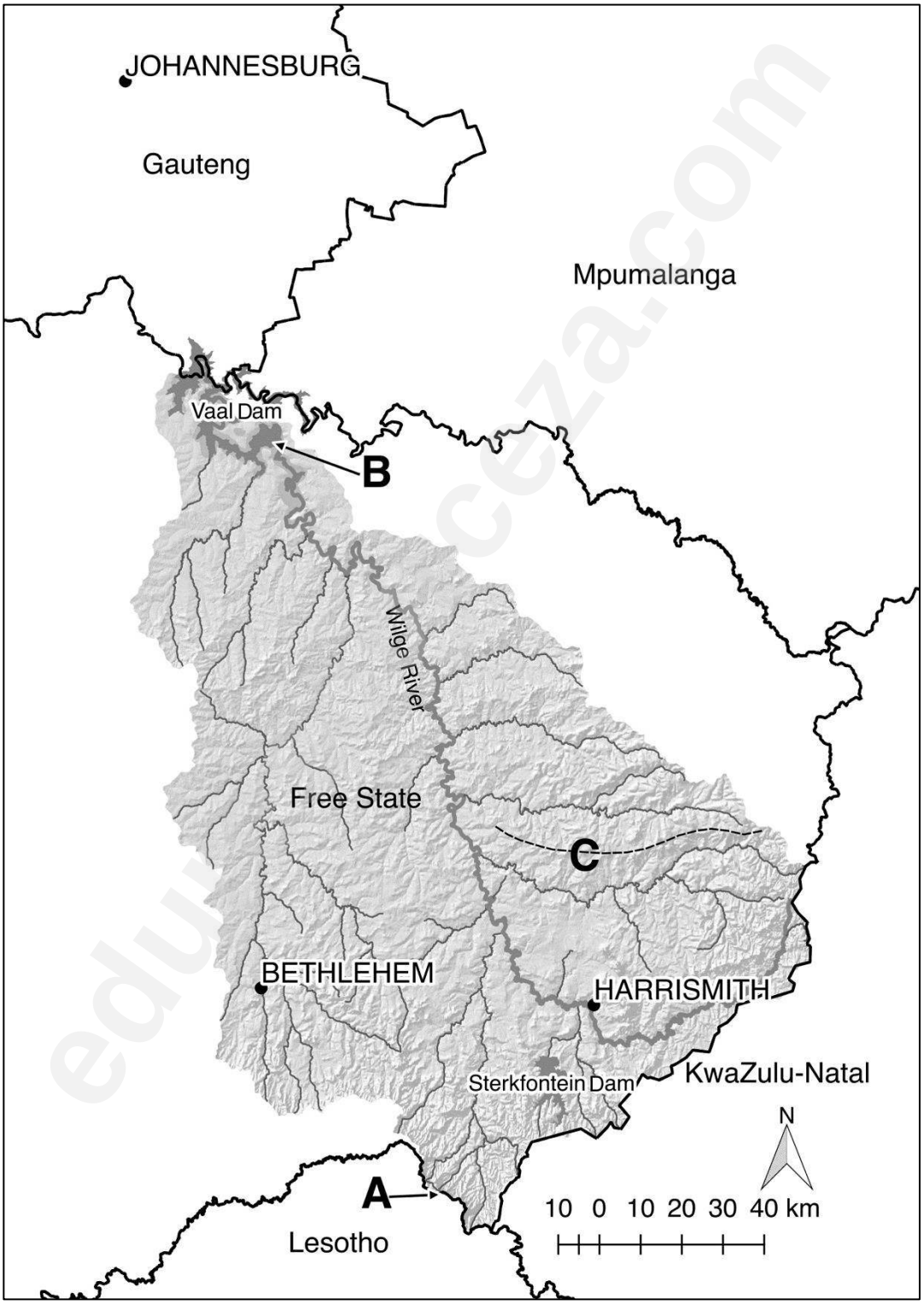
2.4 Drainage systems in South Africa

Study Figure 11 below, a map of the Wilge River drainage basin in the Free State, South Africa, and answer the questions that follow.

Figure 11: The Wilge River drainage basin



[Source: GIS-generated map]

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(a) **Select** the underlined term or terms to correctly complete the statement. Write only the number of the question and the correct term, e.g. (i) Water.

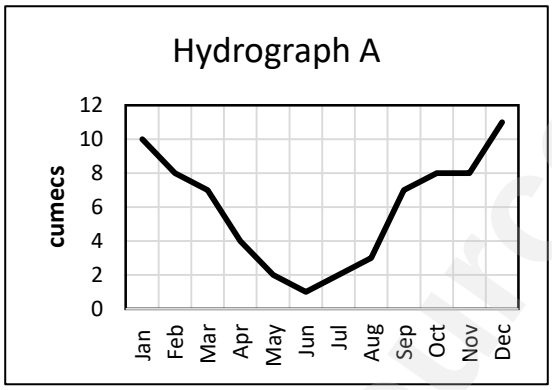
(i) The watershed labelled A is the Waterberg / Magaliesberg / Drakensberg. (2)

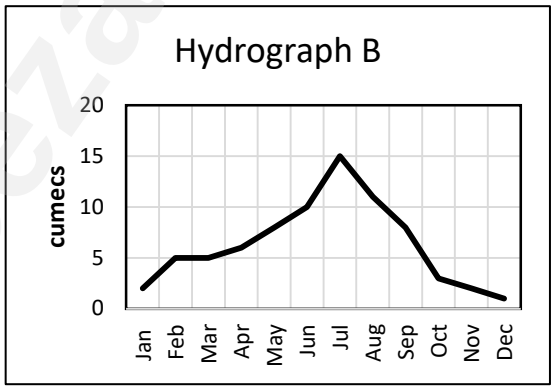
(ii) The fluvial process you are most likely to encounter at B is transportation / deposition / lateral erosion. (2)

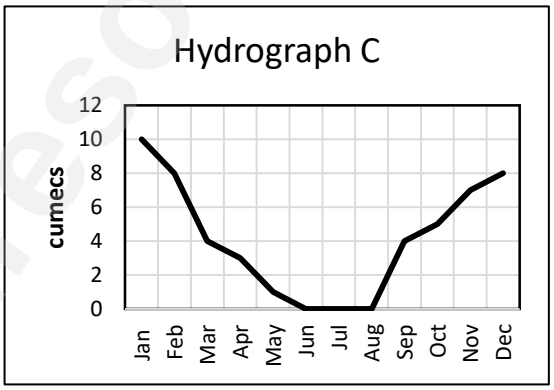
(iii) The fluvial feature indicated by the dashed line marked C is a/an interfluve / back marsh / confluence. (2)

(iv) The drainage pattern of the Wilge River is dendritic / trellis / parallel. (2)

(b) Study the three hydrographs below.







(i) Choose the hydrograph that best **matches** the Wilge River system. (2)

(ii) **Account for** your answer to Question 2.4 (b) (i). (4)

(iii) **Explain** how urban sprawl in towns like Harrismith and Bethlehem affects the discharge and lag time of a hydrograph. (4)

(iv) The Wilge River is the main feeder river to the Vaal Dam from the Lesotho Highlands Water Scheme. **Elaborate** on the importance of drainage basin management schemes such as the Lesotho Highland Water Scheme to Johannesburg residents and the industries in the area. (6)

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2.5 River channel, fluvial process and fluvial features

Study Photograph 2 of a river valley in Mpumalanga on page iii of the Colour Insert.

(a) **Name** the stage in which this river channel would most likely be found. (2)

(b) **Identify** the type of flow in the river channel. (2)

(c) **Identify** the fluvial feature shown in the photograph. (2)

(d) **Explain** how the fluvial feature identified in Question 2.5 (c) is formed. (4)

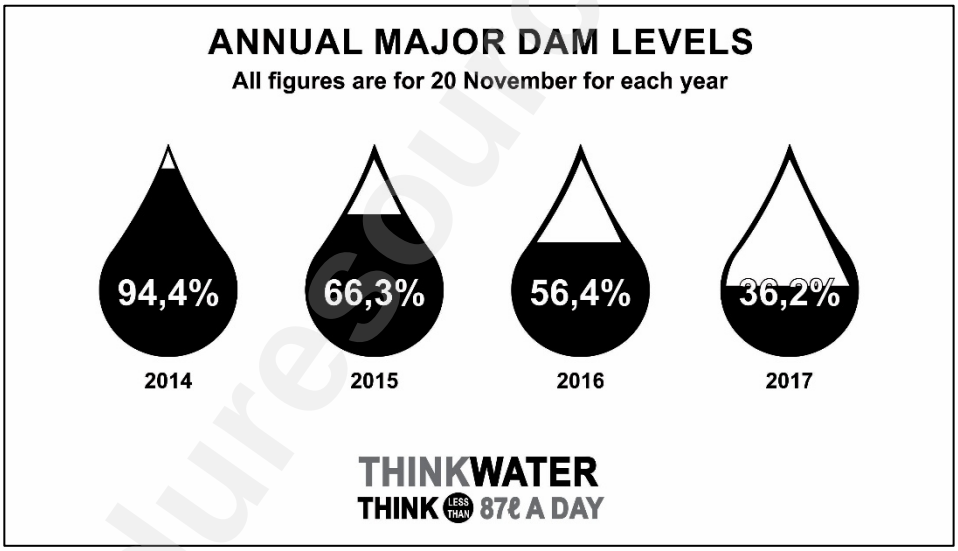
(e) **Identify** the type of transportation that would occur at this stage of a river. (2)

(f) **Describe** the conditions under which a river would transport a load like the one in Photograph 2. (4)

2.6 Dams and drought

Study the infographic below of dam levels in the Western Cape in November 2017.

Figure 12: Infographic on dam levels in the Western Cape



[Source: <capetown.gov.za>]

(a) **Define** the term water security. (2)

(b) **Calculate** by what percentage water levels had dropped from 2016 to 2017. (2)

(c) In the space provided on page ii of the Answer Sheet**, design** your own infographic in which you explore:

- the consequences of water scarcity in Cape Town
- possible solutions to the water crisis in Cape Town (8)

100 marks

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SECTION C **RURAL AND URBAN SETTLEMENT AND ECONOMIC GEOGRAPHY OF SOUTH AFRICA**

QUESTION 3 **RURAL SETTLEMENT, URBANISATION, INFORMAL SETTLEMENTS, URBAN FUNCTIONS, MIXED-USE DEVELOPMENT AND URBAN RENEWAL, LAND REFORM, ECONOMIC SECTORS, GAUTENG, DIAMOND MINING**

3.1 **Rural settlement**

Study the settlement circled on Photograph 3, on page iii of the Colour Insert, of a rural settlement in KwaZulu-Natal.

(a) Choose the words that **match** the description of the settlement in Photograph 3. Write only the question number and the correct term in your Answer Book, e.g. (i) House

(i)	Pattern	**nucleated**	**isolated**	**dispersed**
(ii)	Shape	**cross road**	**round**	**linear**
(iii)	Type	**farmstead**	**village**	**small country town**
(iv)	Type of farming activity	**intensive commercial**	**extensive commercial**	**subsistence**

(8)

(b) "At higher levels of development, the distinction between urban and rural is increasingly difficult to make." **Assess** the validity of this statement. (6)

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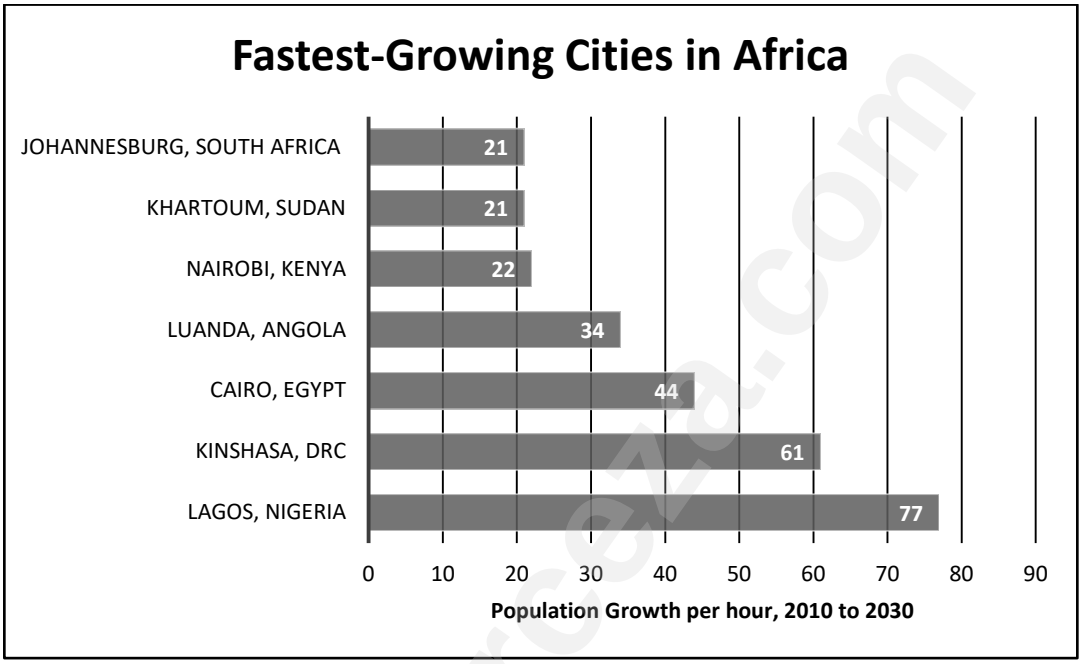
3.2 Urbanisation

Study the graph in Figure 13 below that shows the hourly growth of the fastest-growing African cities.

Figure 13: Graph of the fastest-growing African cities



[Adapted from the World Economic Forum]

(a) **Calculate** the daily growth of Johannesburg's population. (2)

(b) **Outline** TWO causes of the rapid growth in these cities. (4)

(c) **Assess** the benefits that migrants might experience in these cities. (6)

3.3 Informal Settlement

Study Photograph 4, on page iii of the Colour Insert, of a typical informal settlement in South Africa.

(a) Give ONE piece of evidence from Photograph 4 to **outline** how you can tell that this is an informal settlement. (2)

(b) **Identify** ONE infrastructural service provided to the people who live in this settlement. (2)

(c) **Explore** some obstacles that people in an informal settlement in South Africa have to face daily. (4)

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3.4 Urban functions

Photograph 5, on page iv of the Colour Insert, shows three businesses, A, B and C, next to each other on a street corner.

(a) **Indicate** which business, A, B or C, would have the lowest-order goods of the businesses shown in Photograph 5. (2)

(b) **Examine** which business, A, B or C, would have the largest sphere of influence. (4)

(c) **Analyse** whether the position of these stores is due to functional convenience or functional magnetism. (4)

3.5 Mixed-use development and urban renewal

Read the following article and study Photograph 6 below the article. Both relate to a new development in the city centre.

Fact file: Cape Town's new urban lifestyle

A new computer application has been released giving a clearer look into the scope and scale of Cape Town's new R8 billion precinct, Harbour Arch.

Harbour Arch is modelled on an existing project in northern Johannesburg – Melrose Arch. The new development will take approximately a decade to complete and will involve an investment of approximately R8 billion.

On completion, the 5.8 hectare Harbour Arch will be contained in its own precinct, much like Melrose Arch, and will be home to seven individual tower blocks with a total of 200 000 square metres of usable space – making it the first and largest mixed-use development of its kind in the Cape Town CBD.

Phase 1 of the residential aspect of the project has already kicked off, while a hotel partnership has also been announced.

[Source: <https://businesstech.co.za>]

Photograph 6: An artist's impression of the Harbour Arch development in the CBD of Cape Town.

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(a) **Explain** the following terms:

(i) mixed-use development (2)

(ii) precinct (2)

(b) **Discuss** some of the socio-economic consequences of new urban developments such as Harbour Arch. (6)

3.6 **Land reform**

Study the cartoon below, Figure 14, on the land reform program in South Africa.

Figure 14: Cartoon on land reform in South Africa

[Source: <https://www.farmersweekly.co.za>]

On the flow diagram on page iii of the Answer Sheet, **analyse** how the land reform process currently works in South Africa. Highlight some of the issues with the current process. (8)

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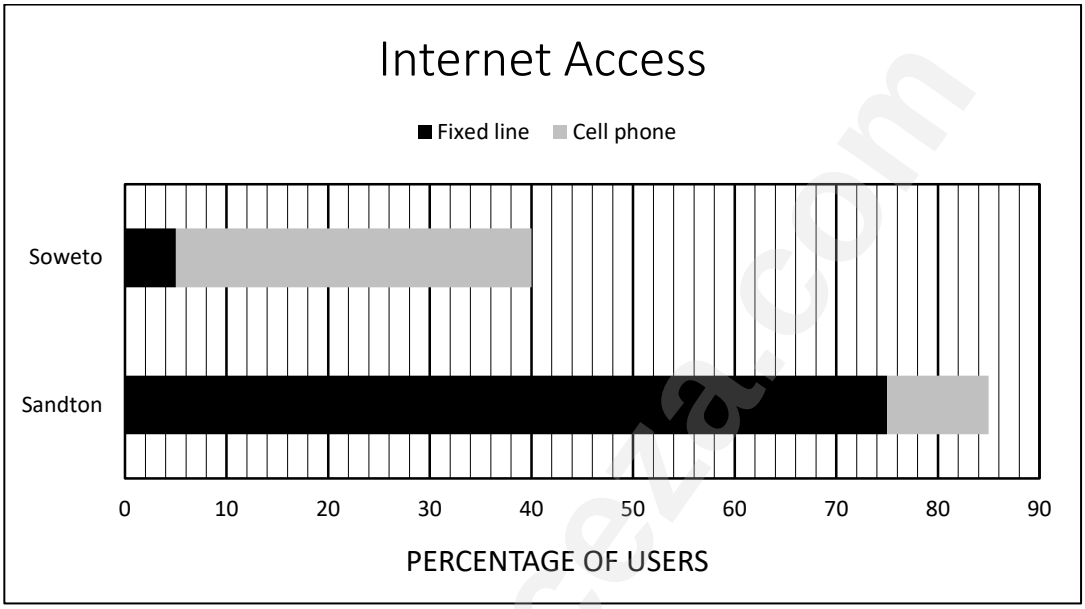
3.7 Structure of the economy and informal sector

Study the graph below (Figure 15) which shows internet access in Soweto and Sandton in Gauteng.

Figure 15: Internet access in Soweto and Sandton in Gauteng.



[Source: Adapted from Gauteng City Region Observatory]

(a) **Name** the sector of the economy an internet provider falls within. (2)

(b) **Account for** the difference in internet usage between Sandton and Soweto. (4)

(c) *"The sale of* sim *cards and mobile data has become a mainstay of the informal sector in Soweto."*

(i) **Explain** what the informal sector is. (2)

(ii) **Discuss** why sim cards and data are easy products for people in the informal sector to sell. (4)

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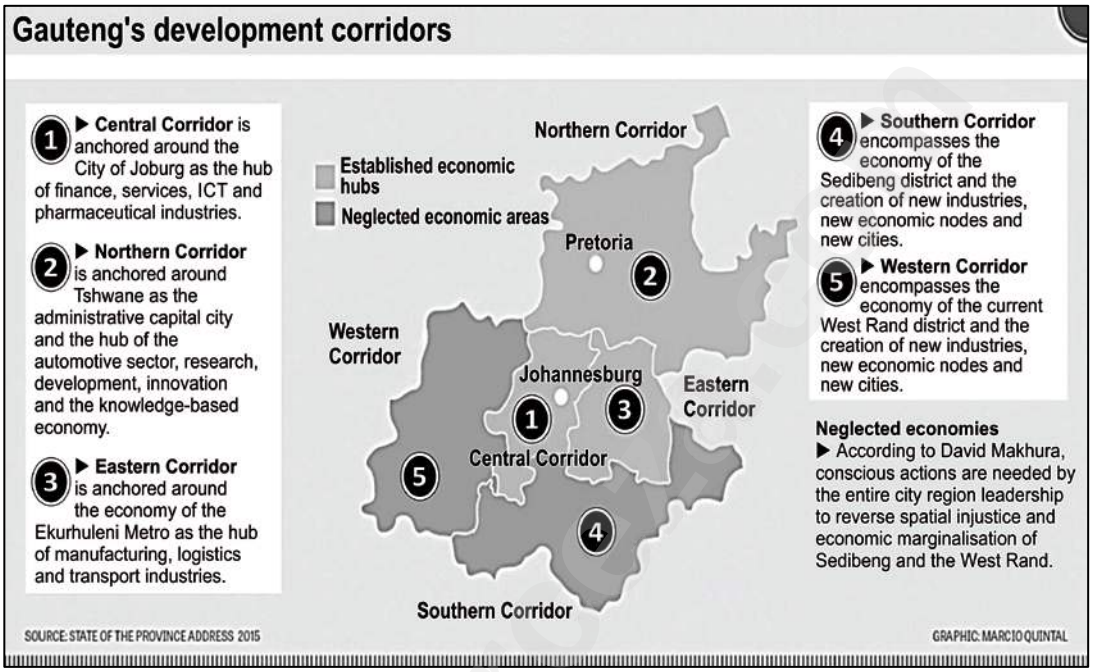
3.8 Gauteng

Study the infographic below (Figure 16) showing the current Gauteng Provincial Government's development plans.

Figure 16: Gauteng development corridors



[Source: The *Citizen*]

Complete the mind map on page iv of the Answer Sheet by **describing** the Gauteng Industrial Region under the following points:

- Major industries
- Factors that promote industrial development
- Factors that hinder industrial development
- Aspects contributing to future economic growth (12)

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3.9 **Diamond mining**

Study Figure 17, an infographic on page iv of the Colour Insert, on the state of diamond mining globally since 2007.

(a) **Explain** the following concepts:

(i) peak production (2)

(ii) kimberlite (2)

(b) **Identify** the largest producer of diamonds in Africa. (2)

(c) **Account for** the rapid increase in the production of diamonds between 1980 and 2005. (4)

(d) **Suggest** TWO reasons for the stabilisation of diamond production since 2010. (4)

100 marks

Total: 300 marks

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