

**GEOGRAPHY: PAPER I**

Time: 3 hours

300 marks

---

**PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY**

1. This question paper consists of 20 pages and a Colour Insert of 1 page (i). Detach the Colour Insert 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. Number your answers exactly as questions are numbered.
  7. It is in your own interest to write legibly and to present your work neatly.
  8. There is a GLOSSARY of words on page 2 explaining what the words in **bold** used in the questions mean.
  9. 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.
-

**GLOSSARY**

<b>WORD</b>	<b>MEANING</b>
<b>Account for</b>	To justify, and provide reasons for something using a short explanation.
<b>Calculate</b>	To work something out using a mathematical method.
<b>Comment (on)</b>	To give your opinion or make a statement about something; to write generally about.
<b>Compare</b>	To note the similarities and/or differences between two things.
<b>Compile</b>	To put something together; to draw up.
<b>Describe</b>	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).
<b>Detail</b>	To list; to give information about something.
<b>Discuss</b>	To examine or investigate by way of an argument the various aspects of a statement.
<b>Draw</b>	To show by means of a sketch.
<b>Elaborate (on)</b>	To give details about something.
<b>Estimate</b>	An approximate calculation or judgement of the value, number, quantity, or extent of something.
<b>Examine</b>	To look at carefully.
<b>Explain</b>	To make clear or plain. To make sure the reader understands what is being said.
<b>Identify</b>	To give the essential characteristics of; to name.
<b>Match</b>	To find the exact counterpart of another.
<b>Mind map</b>	A series of text bubbles and arrows used to visually organise information. Shows relationships among pieces of the whole.
<b>Name</b>	To state something; to give; to mention.
<b>Outline</b>	A general description or plan showing the main features of something.
<b>Predict</b>	To say what is expected to happen; to foretell; to say in advance.
<b>Prepare</b>	To put together.
<b>Provide</b>	To give.
<b>Select</b>	To choose; to pick out the correct answer from several alternatives.
<b>Suggest</b>	To put forward an idea, to recommend, or propose something.
<b>Write</b>	Make a note of, or list.

**SECTION A            GEOGRAPHICAL ISSUES****QUESTION 1        FOOD SECURITY AS A GEOGRAPHICAL ISSUE**

Limpopo Province has the highest level of poverty of any South African province, with 78,9% of the population living below the national poverty line. In 2011, 74,4% of local dwellings were located in a tribal or traditional area, compared to a national average of 27,1%. Rural depopulation is an issue in this area, particularly young adult men (20–40 years) moving to nearby towns.

[Source adapted from: Wikipedia, 2017]

**FOOD SECURITY AS A RURAL ISSUE**

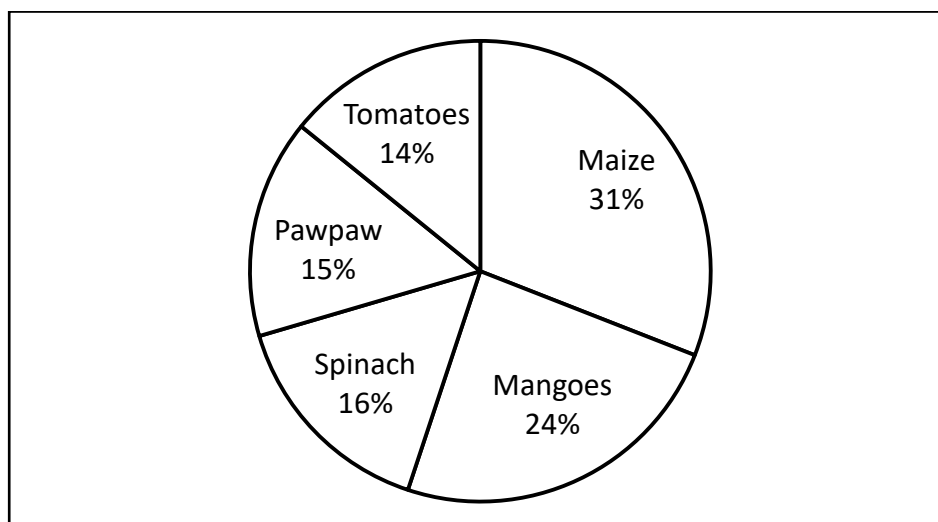
Study Table 1 below which presents food security data for 599 rural households across the province of Limpopo. Also study Figure 1 below, showing subsistence farming crops grown in Limpopo.

**Table 1: Food Security Statistics for the Limpopo province, 2015**

District	Municipality	Food secure (%)	Severely food insecure (%)
<b>Capricorn</b>	Blouberg	9,1	62,1
	Molemole	13,5	59,6
<b>Mopani</b>	Giyani	8,2	62,3
	Maruleng	6,7	65,0
<b>Sekhukhune</b>	Fetakgomo	29,3	25,9
	Tubatse	18,6	32,2
<b>Vhembe</b>	Mutale	13,3	41,7
	Thulamela	20,7	50,0
<b>Waterberg</b>	Mookgopong	10,3	67,2
	Mogalakwena	18,6	64,4
<b>Overall</b>		14,8	53,1

[Source: De Cock, N., D'Haese, M., Vink, N. et al. Food Sec. (2015) 5: 269.]

**Figure 1: Subsistence farming production crops, Limpopo province**



[Source: De Cock, N., D'Haese, M., Vink, N. et al. Food Sec. (2015) 5: 269]

## 1.1 Rural Settlement Issues

**Match** the concepts in Column A with the correct statement in Column B. Write **ONLY** the number and the correct letter, for example 1.1.1 – A.

Column A		Column B	
1.1.1	Informal sector	A	Equitable distribution and ownership of land through a change in land ownership policies
1.1.2	Land reform	B	A part of the economy that is neither taxed nor monitored by any form of government
1.1.3	Urbanisation	C	Growing food and keeping stock to feed your family
1.1.4	Food security	D	An increase in the proportion of people living in towns and cities
1.1.5	Subsistence farmer	E	Land that was forcibly removed from people under apartheid rule
		F	The movement of people from urban to rural areas
		G	The effect of rural depopulation on a settlement
		H	Ensuring regular access to and supply of food to a region

(10)

1.2 Study Table 1 and Figure 1 on page 3. Answer the questions that follow.

1.2.1 **Name** the staple food crop of rural communities living in Limpopo. (2)

1.2.2 (a) Which of Limpopo's districts has the greatest food security? (2)

(b) **Suggest** TWO possible factors that may have contributed to this district (1.2.2 (a)) being food secure. (4)

1.2.3 Which district has the greatest food insecurity issue? (2)

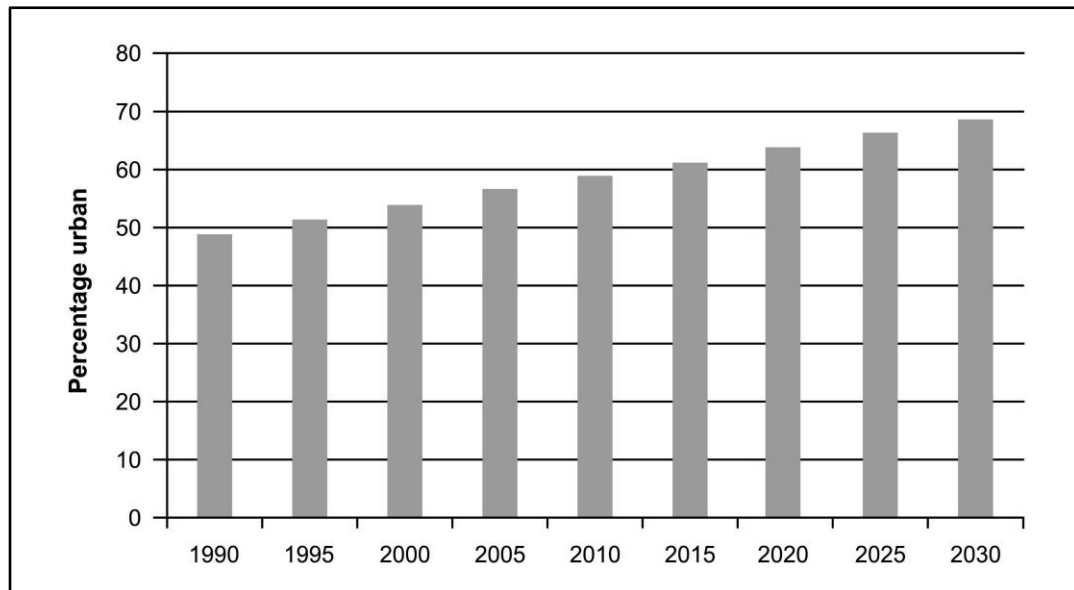
## 1.3 Food Security as an Urban Issue

Read the information in the Fact File below and study Figure 2 and Figure 3 on page 5 carefully before answering the questions that follow.

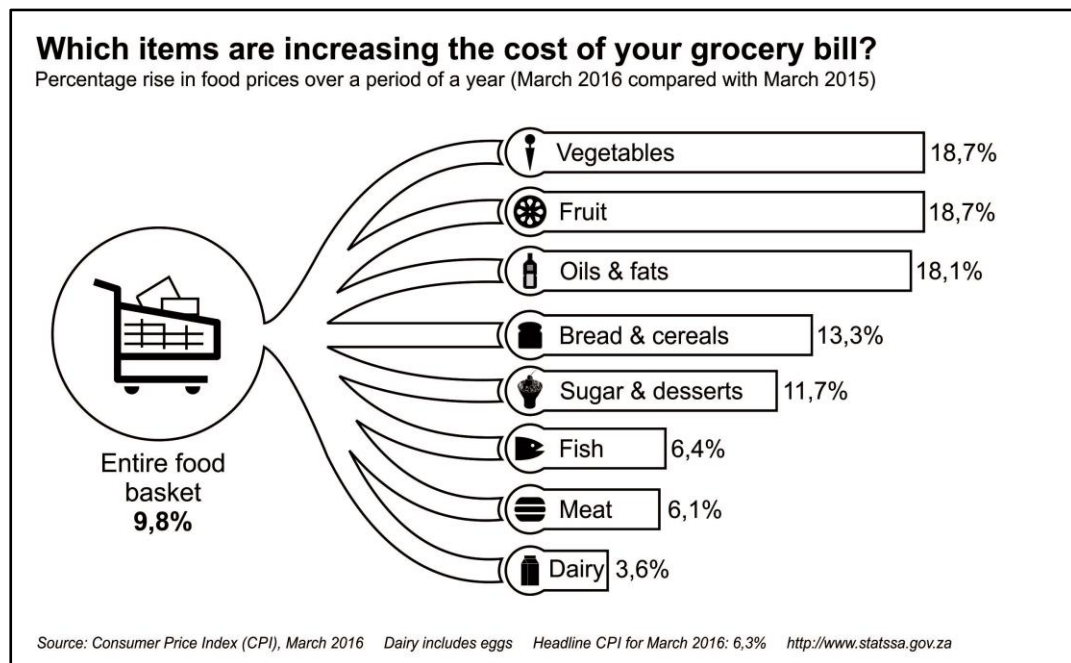
### FACT FILE – FOOD SECURITY AS AN URBAN ISSUE

Southern Africa's population is already more than 60% urbanised. Whereas food shortages have historically been associated with rural communities, this is no longer the case. With sustained urbanisation, the focus of poverty is now shifting from rural to urban areas in the region. In addition, the recent sharp rise in food prices, together with an economic decline, all suggest that poor urban households are experiencing food shortages.

[Source adapted from: Frayne, B., Battersby-Lennard, J., Fincham, R. & Haysom, G. (2009)]

**Figure 2: Percentage urban population in southern Africa***(Note: Years 2020–2030 predicted)*

[Source: UN World Urbanisation Prospects]

**Figure 3: Food price increases in South Africa (March 2015–March 2016)**

[Source: Consumer Price Index, March 2016]

Study Figures 2 and 3 above. Answer the questions that follow.

1.3.1 Refer to Figure 2 above.

- (a) **Describe** the trend Figure 2 illustrates. (2)
- (b) **Account for** the trend illustrated in Figure 2. **Provide TWO** reasons for your response. (4)

1.3.2 The Fact File (page 4) mentions that in southern Africa poverty is moving from rural to urban areas. **Suggest TWO** reasons why poverty is increasingly becoming an urban settlement issue. (4)

1.3.3 Refer to Figure 3, on page 5.

(a) On average, by what percentage have entire 'food basket' prices increased over the period of a single year? (2)

(b) Which food products have seen the greatest increase in price over the period 2015–2016? (4)

1.3.4 Using your knowledge of South Africa's economy and agriculture, **discuss THREE** factors that have caused food prices to increase in recent years. (6)

1.3.5 **Identify and explain THREE** factors that are likely to influence urban food security in the future. (6)

#### 1.4 Sustainable Urban Settlements and Urban Climates

Read the information in the newspaper article below and study Photograph 1 (page 7) carefully before answering the questions that follow.

##### HYDROPONIC ROOFTOP FARMS BOOST JO'BURG

- Johannesburg is one of many cities in the world turning to inner-city farming to solve the problems of high unemployment and food insecurity, and in the process **regenerating neighbourhoods**.
- The Kotze Street **rooftop garden** is made up of two dozen rows of metal tunnels covered with shade cloth, which are raised slightly above the concrete roof (see Photograph 1, page 7).
- The garden uses **hydroponic technology** – the crops are grown without soil in special water solutions. The rooftop garden also recycles up to 90% of the water it uses. Hydroponic vegetables grow faster than crops in soil.
- One square metre plot can yield between 4 to 9 kg of spinach per harvest. The price of spinach averages between R35 to R40 a kilogram.
- One of the women from the Kotze co-operative says urban farming has enabled her to develop entrepreneurial skills and has given her an opportunity to make a decent living, despite her lack of formal education.

[Source adapted from: *Mail & Guardian*, October 21–27 2016]

**Photograph 1: Urban rooftop gardens, Kotze Street, Johannesburg CBD, Gauteng**



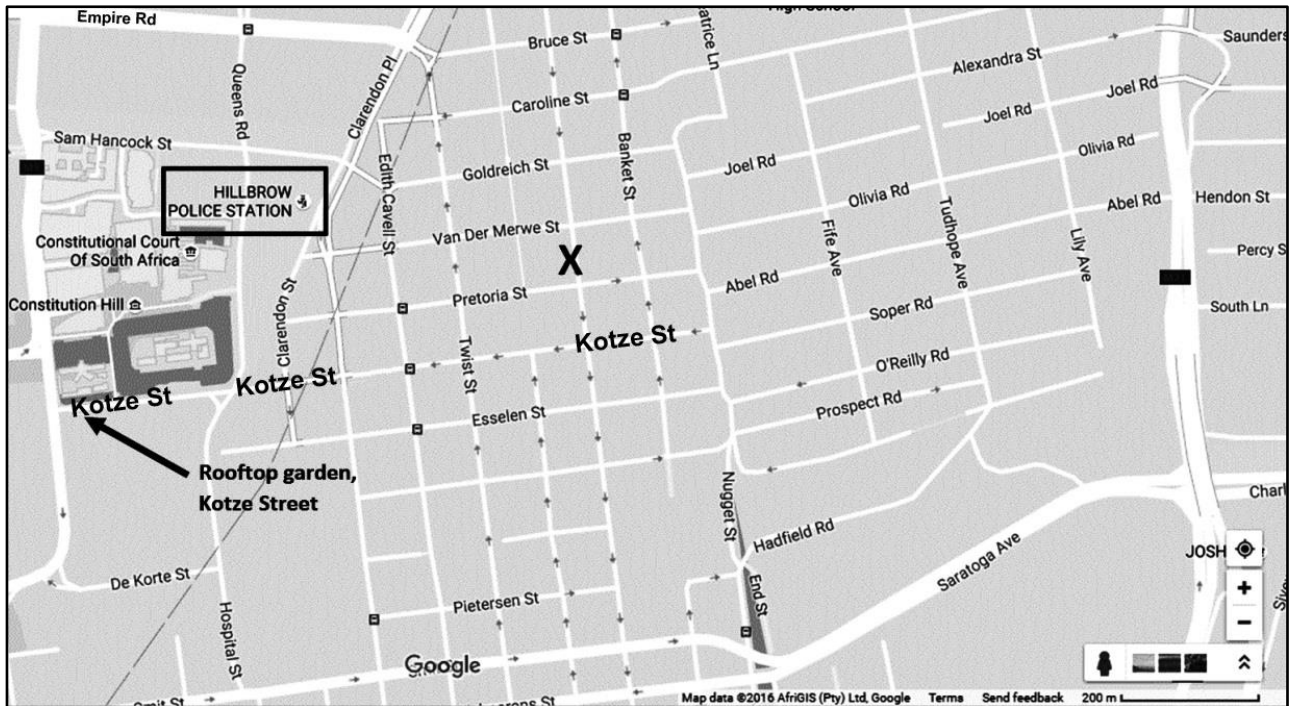
[Photographer: Oupa Nkosi, *Mail & Guardian*, October 2016]

- 1.4.1 (a) What is an urban rooftop garden? (2)
- (b) Why are urban rooftops seen as suitable areas for urban food gardens? **Provide TWO** reasons. (4)
- (c) Why is hydroponic technology a more effective way of growing crops in urban areas? (4)
- (d) In what ways can rooftop gardens be considered a useful urban renewal (regeneration) strategy? (4)
- 1.4.2 Kotze Street (*as referred to in the news article on page 6 and Photograph 1 above*) is located in the CBD of Johannesburg. Daytime temperatures in this area can reach 5 °C warmer than the outer-lying, rural-urban fringe of Johannesburg.
- Draw** a well-labelled diagram with short notes to **account for** the higher temperatures experienced in the CBD of Johannesburg. (6)
- 1.4.3 **Suggest** how rooftop gardens such as the Kotze Street garden (Photograph 1) can play a role in reducing the urban heat island effect. (4)

### 1.5 Geographical Skills and Techniques and Urban Structure and Patterns

The location of the rooftop garden project (Kotze Street), mentioned in the previous question (1.4), is indicated on Figure 4 below.

**Figure 4: Google Maps image depicting the CBD area of Johannesburg, Gauteng. Note the location of the Kotze Street rooftop garden as indicated by the arrow.**



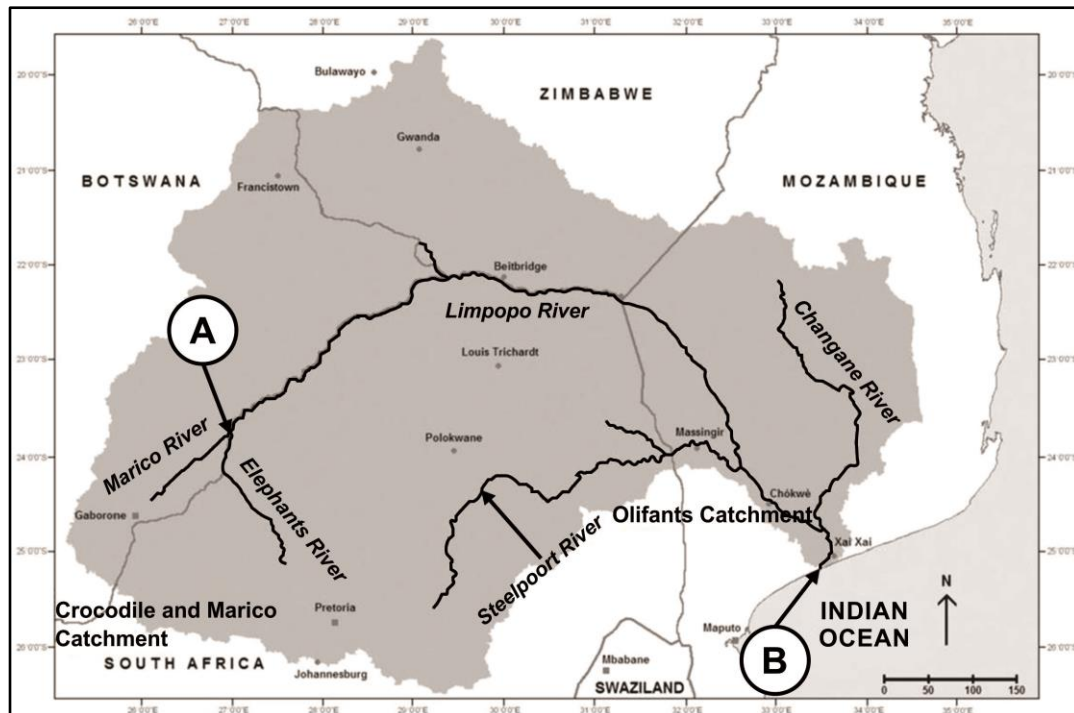
[Source: Google Maps]

- 1.5.1 **Name** the predominant street pattern visible at X seen on Figure 4. (2)
- 1.5.2 Locate Kotze Street. Is this street a one-way? **Explain** your answer using map evidence. (4)
- 1.5.3 **Describe** ONE advantage and ONE disadvantage motorists face with the typical CBD street pattern and system of one-ways as shown in Figure 4. (4)
- 1.5.4 Suppose Figure 4 is an interactive GIS map. If you clicked on the Hillbrow Police Station, what attribute data is likely to be provided? **Provide** TWO possible examples. (4)
- 1.5.5 Looking at Figure 4, **name** TWO GIS data layers on this map. (4)



## 1.6 Drainage Systems in South Africa

**Figure 5: Limpopo River drainage basin, Limpopo province**



[Source: *Water* (2011), available online: <<http://www.mdpi.com/2073-4441/3/3/737/htm>>]

**Provide** the correct term for each of the statements below. Refer to Figure 5 above to assist you.

- 1.6.1 The point where one river system joins another, as seen at A, is referred to as the ... (2)
- 1.6.2 The point where the Limpopo River flows out into the Indian Ocean at B is the ... (2)
- 1.6.3 **Name** TWO tributaries of the Limpopo River. (4)
- 1.6.4 Figure 5 is a simplified map of the Limpopo River drainage basin. Based on the information in Figure 5, **calculate** the final stream order for the Limpopo River at point B. (2)

**100 marks**

**SECTION B CLIMATE AND WEATHER AND GEOMORPHOLOGY****QUESTION 2 MID-LATITUDE CYCLONES, VALLEY CLIMATES, SUBTROPICAL ANTICYCLONES AND ASSOCIATED WEATHER CONDITIONS, TROPICAL CYCLONE FANTALA, DRAINAGE SYSTEMS, FLUVIAL FEATURES AND PROCESSES AND CATCHMENT MANAGEMENT****2.1 Mid-latitude Cyclones and Valley Climates****Multiple Choice**

**Select** the most appropriate option from the list. Write down only the number and correct letter, for example 2.1.1 – A.

2.1.1 The warm layer of air midway up a valley with cold air lying beneath it is referred to as a/the ...

- A dew point temperature.
- B thermal belt.
- C heat island.
- D frost pocket.

(2)

2.1.2 The cool wind that blows down the sides of a valley during the night and early morning is known as a/an ...

- A anabatic wind.
- B radiation wind.
- C berg wind.
- D katabatic wind.

(2)

2.1.3 Select the statement which accurately describes a mid-latitude cyclone.

- A Travelling low-pressure system consisting of both a cold and warm front that impacts on the weather of the southern Cape during winter months.
- B Forms to the south-west of South Africa and moves from east to west during the winter months.
- C Travelling low-pressure system driven along by the upper atmospheric jet streams impacting upon the whole of South Africa throughout the year.
- D A low-pressure system, also known as a cut-off low, consisting of a polar front and warm front bringing snow, rain and strong winds to the Western Cape during winter.

(2)

2.1.4 A/an ... occurs when a cold front overtakes a warm front at the surface and a temperature difference exists between the advancing and retreating cold air masses.

- A jet stream
- B family of cyclones
- C polar front
- D occlusion

(2)

## 2.2 Weather Conditions in South Africa

The following headlines were prepared by the South African Weather Service between June–August 2016.



1. **Expect more cold and windy weather on Thursday over the Cape**
2. **Icy temperatures hit Jo'burg: city is frosty and dry**
3. **Flooding affects thousands in Cape Town**
4. **Berg winds fuel fires in Pietermaritzburg, KZN**
5. **Cold front expected in south of the country**

[Source: South African Weather Service]

- 2.2.1 **Name** the common weather system that is associated with Headlines 1, 3 and 5. (2)
- 2.2.2 Refer to Headline 2. With the aid of an annotated diagram, **account for** the "frosty and dry" conditions that are common in Johannesburg / Gauteng during the winter months. (8)
- 2.2.3 Refer to Headline 4.
- (a) What is a berg wind? (2)
  - (b) **Discuss** the possible impact of berg winds on human activities in Pietermaritzburg and the surrounding areas. (4)
- 2.2.4 **Draw** ONE synoptic sketch weather map illustrating the conditions for South Africa that represents all of the above headlines mentioned. Your synoptic sketch weather map must be carefully labelled. Take care to provide air pressure readings where appropriate. You may also like to include at least ONE weather station model on your sketch map. (10)

### 2.3 Tropical Cyclone Fantala

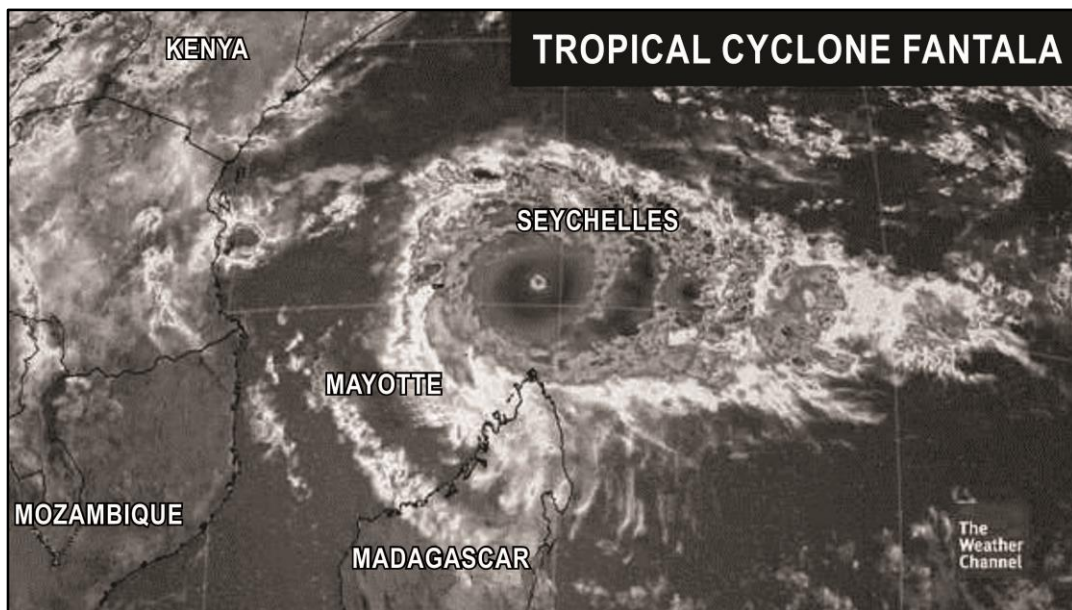
Read the Fact File and study Figure 6 below, which represents a satellite image of Tropical Cyclone Fantala (21 April 2016).

#### FACT FILE – TROPICAL CYCLONE FANTALA

- The 2015–16 South-West Indian Ocean cyclone season was a slightly below average season of tropical cyclone formation.
- The annual cyclone season began on 15 November 2015, with the first storm named Annabelle.
- The final and strongest storm, Fantala, dissipated on 24 April 2016, though the season ended on 30 April, with the exception of Mauritius and the Seychelles where it ended on 15 May. The season's activity was influenced by an ongoing El Niño event.
- Most systems of the season remained weak, with only three cyclones reaching at least tropical cyclone strength. However, the season featured very intense Tropical Cyclone Fantala, which became the strongest cyclone on record in the region with sustained wind speeds up to 250 km/h.

[Source adapted from: Wikipedia.com]

**Figure 6: Tropical Cyclone Fantala**



[Source: The Weather Channel]

**Prepare** a report for the South-West Indian Ocean Tropical Cyclone Monitoring Research Station in which you **detail** and **account for** the following:

- The Indian Ocean and atmospheric conditions required for the formation of a tropical cyclone like Fantala.
- The mature stage of a tropical cyclone.
- Necessary strategies South-West Indian Ocean islands need to put in place to prepare for and manage the effects of tropical cyclones.

You may use diagrams to support your report where appropriate. Refer to the report rubric below to guide your response.

Criteria	
<b>Writing Skills</b> Use of brief introduction and conclusion. Logical discussion and use of subheadings.	<b>5</b>
<b>Content Knowledge</b> Correct use of geographical terminology.	<b>14</b>
<b>Supporting evidence – analysis and understanding</b> Reference made to case study material / Fact File / source material provided. If appropriate, reference must be made to local or familiar examples.	<b>5</b>

(24)

## 2.4 Drainage Systems in South Africa

**Write** down the correct geographical term for each of the statements below.  
**Write** down your answers in your Answer Book alongside each question number, for example 2.4.1 – Ground water.

- 2.4.1 The upper level of ground water, indicated by a zone of saturated rock. (2)
- 2.4.2 The ground water that feeds into the bed of a river. (2)
- 2.4.3 A type of river that will only flow after a heavy rain shower. These rivers have no ground water supply. (2)
- 2.4.4 Underlying igneous rocks with joints and cracks frequently give rise to this type of drainage pattern. (2)
- 2.4.5 The amount of water flowing in a river channel past a point at a particular time is referred to as the ... (2)

## 2.5 Fluvial Features

**Figure 7: Aerial view of the Klip River near Ladysmith, KwaZulu-Natal province**



[Photographer: Richard du Toit, Getty Images]

- 2.5.1 **Identify** the fluvial feature at A on Figure 7. (2)
- 2.5.2 Using a series of sketches and short notes, **account for** the development of this fluvial feature (A). (6)
- 2.5.3 When the water completely dries up in the above feature pointed out at A, what feature will remain behind? (2)
- 2.5.4 **Provide** the correct name for the wide, flat area indicated by the letter B (Figure 7). (2)
- 2.5.5 The area at B is frequently used by farmers for agricultural land. **Suggest** why; **provide** TWO reasons. (4)
- 2.5.6 **Identify** TWO challenges farmers may face if planting their crops in the area of B. (4)

## 2.6 Fluvial Processes, Catchment and River Management

The Great Kei River is a river in the Eastern Cape. It is formed by the confluence of the Black Kei and White Kei Rivers. It flows for 320 km and ends in the Great Kei Estuary at the Indian Ocean with the small town Kei Mouth on the west bank. The Great Kei River bridge (see Photograph 2 on page 15) which forms a part of the N2 highway is located 73 km from the town of Kei Mouth.

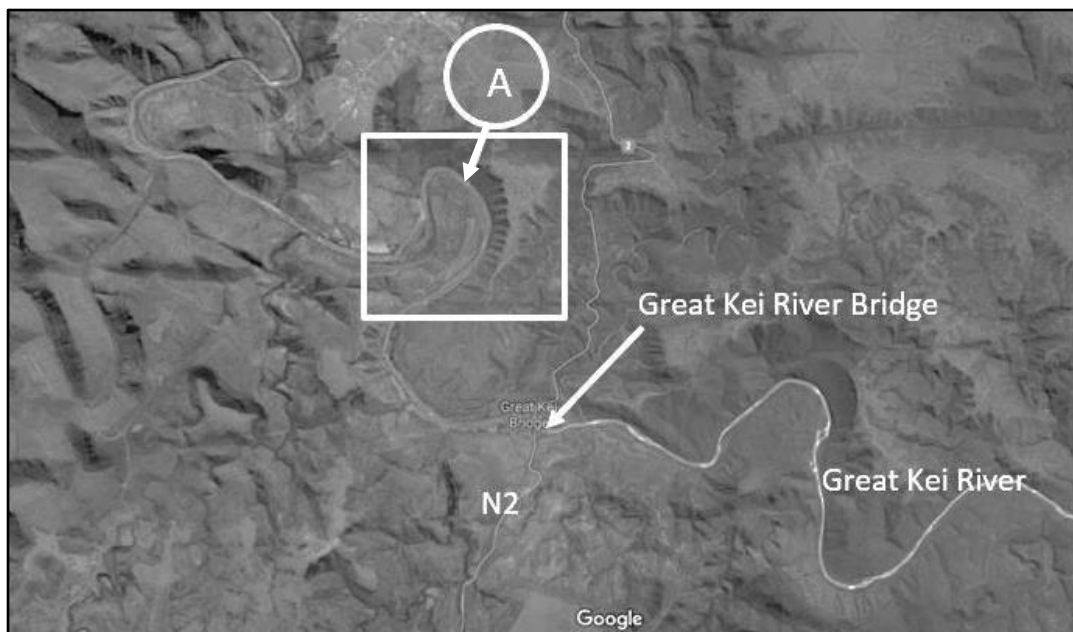
[Source: DWAF, 2010]

**Photograph 2: Photograph of the Great Kei River Bridge forming a part of the N2 highway**



[Photographer: William Martinson]

**Figure 8: Google Earth image of the Great Kei River and river bridge as featured in Photograph 2**



[Source: Google Earth]

- 2.6.1 Study Photograph 2 and Figure 8 (both on page 15). Based on your analysis of these images, **select** the best description of this section of the Great Kei River as illustrated.
- (a) Turbulent and non-perennial, or
- (b) Laminar and meandering. (2)
- 2.6.2 **Identify** the river course of the Great Kei River at the Great Kei River Bridge. **Provide** TWO pieces of evidence to validate your answer. (4)
- 2.6.3 Refer to Figure 8 (page 15). The letter A points to an example of an '*ingrown meander*', which is a type of incised meander. **Provide** ONE typical characteristic of an incised meander. (2)
- 2.6.4 Refer to Photograph 2 (page 15). **Provide** TWO ways in which civil engineers have constructed the Great Kei River bridge over the N2, such that it will be able to withstand a severe flood event. (4)

<b>100 marks</b>
------------------



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

### QUESTION 3

#### 3.1 Rural Settlements

Study Photograph 3 (page (i) of the Colour Insert) of a rural settlement near Ingwavuma, northern KwaZulu-Natal.

3.1.1 Three statements have been made about this rural settlement. With reference to Photograph 3, **explain** the meaning of each statement. Pay attention to the underlined word(s).


- (a) The settlement in Photograph 3 is in a good defence site. (2)
- (b) The settlement pattern is linear in shape. (2)
- (c) Farming in this area is subsistence. (2)

3.1.2 **Describe** the photographic evidence which suggests that rural economic development in this area may be limited because of social justice issues. Refer specifically to:

- transport
- water
- electricity
- health care (8)

3.2 Refer to Figure 9, an advertisement promoting George, Western Cape.

**Figure 9: George, the city for all reasons**



Nestled at the foot of the Outeniqua Mountains, George is at the centre of the "Garden Route" in the Cape Wildflower Floral Kingdom and it is strategically situated on the N2 between Cape Town and Port Elizabeth.

George is regarded as the business hub of the Southern Cape Region as well as the "golfing destination" of South Africa. A good road network and the George airport link the Southern Cape and Little Karoo hinterland to the major centres of South Africa.

Situated on the R62 and surprisingly found in a green valley surrounded by hills, lies the Little Karoo's best kept secret, Uniondale. The town is a popular cycling and adventure tourism destination.

The Mediterranean type climate of the region makes it possible to participate in outdoor activities throughout the year.

Population (2011): George – 157 394                      Uniondale – 4 525

[Source: <[www.georgetourism.org.za](http://www.georgetourism.org.za)>]

3.2.1 **Select** the correct underlined word that makes each sentence correct. Write down only the question number and the correct word. For example 3.2.1 (a) conurbation.

- (a) The urban settlement of George is a conurbation / central place / megalopolis. (2)
- (b) The region around George experiences mainly convectional / tropical / winter rainfall. (2)
- (c) The main economic activities that take place in George fall in the primary / secondary / tertiary sector. (2)

3.2.2 **Describe** how the situation of George has encouraged the growth of the settlement. (4)

3.2.3 Copy and complete the table to **compare** George and Uniondale.

Factors	George	Uniondale
Population		
Main function(s)		

(8)

3.3 Refer to Photograph 4 (page (i) of the Colour Insert), which shows commercial functions at an outlying business district (OBD).

3.3.1 A number of words have been provided in the textbox below. You may only use a word once.

<b>formal</b>	<b>informal</b>	<b>high-order</b>	<b>wholesale</b>
<b>unregistered</b>	<b>convenience</b>	<b>suburban</b>	<b>convergence point</b>

- (a) **Select** TWO words that would describe the service provided by function X. (4)
- (b) **Select** TWO words that best describe the activity shown at Y. (4)
- (c) **Select** TWO words that best describe the location of an outlying business district (OBD). (4)

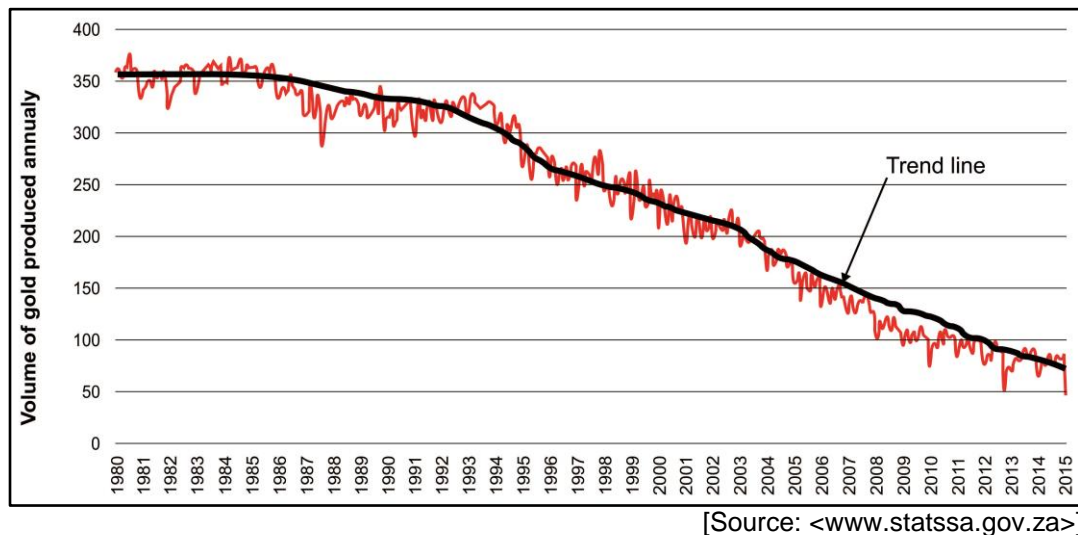
3.3.2 **Comment** on the location of function X within the outlying business district. (4)

3.3.3 **Examine** TWO reasons why function Y is located next to function X. (4)

### 3.4 Gold Mining in South Africa

Refer to Figure 10 below, which shows the annual gold production for South Africa, 1980–2015.

**Figure 10: Annual gold production, 1980–2015**



3.4.1 (a) **Describe** the trend shown in Figure 10. (2)

(b) **Estimate** by how much production has changed from 1980 to 2015. (2)

(c) **Suggest** TWO effects the trend described in Question 3.4.1 (a) will have on the South African economy. (4)

3.4.2 **Compile** a **mind map** in which you **elaborate** on how gold mining has contributed to the economy of South Africa. Consider the following aspects:

- infrastructure
- employment and revenue
- other favourable factors, such as environmental responsibility
- factors hindering gold mining

Note: Use a full page for your answer. (16)

### 3.5 Port Elizabeth-Uitenhage Industrial Region

Refer to Figure 11, an infographic on page 20, showing the Port Elizabeth–Uitenhage industrial region.

3.5.1 Port Elizabeth harbour is a break-of-bulk point. **Explain** what is meant by this term. (2)

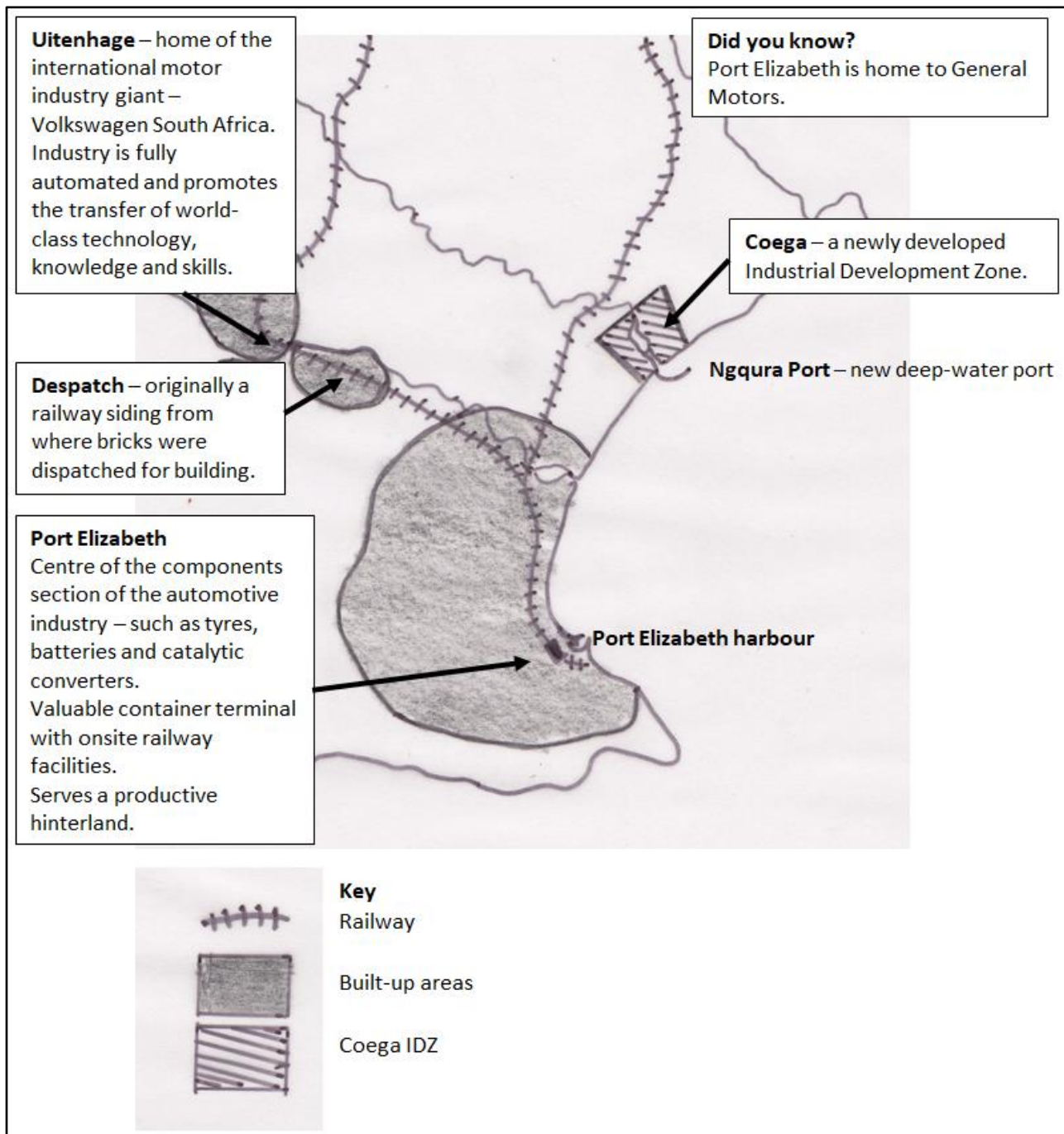
3.5.2 Coega is an Industrial Development Zone (IDZ). **Outline** the main purpose of such a development zone. (2)

3.5.3 **Outline** FOUR factors that have promoted the development of the Port Elizabeth–Uitenhage industrial region. (8)

3.5.4 **Explain** how the motor industry in the area has stimulated other related economic activities in the region. (6)

3.5.5 **Predict**, with reasons, the economic future of the Port Elizabeth–Uitenhage industrial region. (6)

**Figure 11: Infographic of the Port Elizabeth–Uitenhage industrial region**



[Source: Examiner]

**100 marks**

**Total: 300 marks**