GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

# JUNE EXAMINATION
# GRADE 12

# 2024

## 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 the subsections of questions that you answer.
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. 1020 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

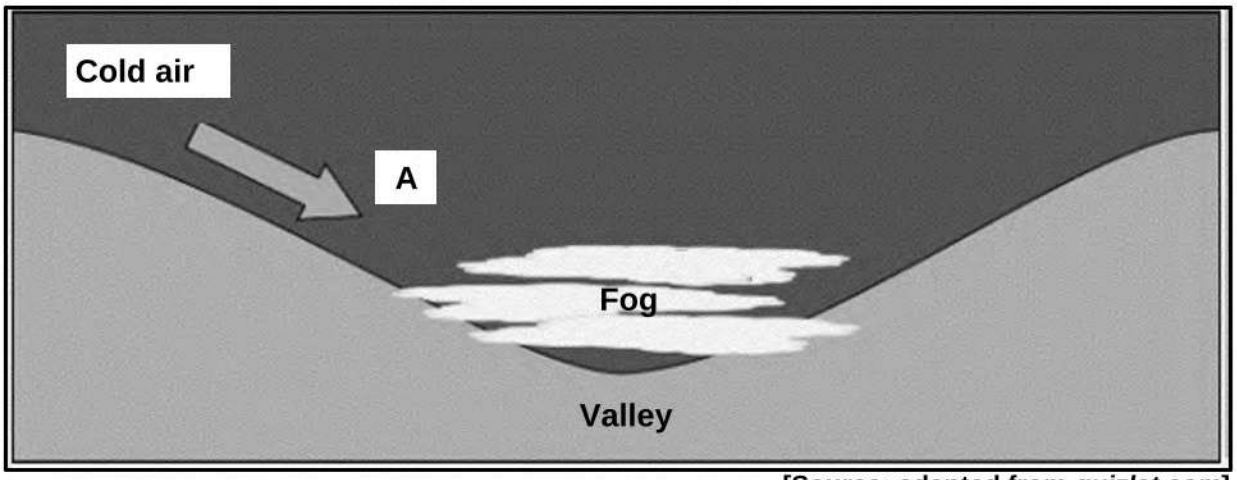
14. A 1: 50 000 topographic map 2430 DB Bourke's Luck and a 1:10 000 orthophoto map 2430 DB 6 are provided.
15. The area demarcated in RED on the topographic map represents the area covered by the orthophoto map.
16. Marks will be allocated for steps in calculations.
17. You must hand in the topographic and orthophoto map 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 sketch of a valley below.

Complete the statements in COLUMN A by choosing the correct options from COLUMN B. Write down only **X** or **Y** next to the question numbers (1.1.1 and 1.1.2) in the ANSWER BOOK.




**[Source: adapted from *quizlet.com*]**

| | COLUMN A | COLUMN B |
|---|---|---|
| 1.1.1 | The temperature of wind **A** indicated by the arrow is … | **X** Cold<br>**Y** Warm |
| 1.1.2 | The process indicated by wind **A** is ... | **X** Katabatic<br>**Y** Anabatic |

(2 x 1) (2)

Refer to the statement below and answer the questions that follow.

| |
|---|
| Researchers have found that South Africa's cities are at risk of becoming warmer amid cooler surrounding rural areas. |

**[Source: Adapted from *The Green Guardian*, July 2021]**

1.1.3 Identify the climatic concept referred to in the above statement.

(1 x 1) (1)

Various options are provided as possible answers to QUESTIONS 1.1.4 and 1.1.5. Choose the answer and write the letter (A – D) next to the question numbers in the ANSWER BOOK.

1.1.4 The following are possible causes of cities becoming warmer than the surrounding rural areas. Choose the correct option from those provided.

(i) Buildings (glass and concrete)
(ii) Tarred roads
(iii) Roof top gardens
(iv) Golf courses

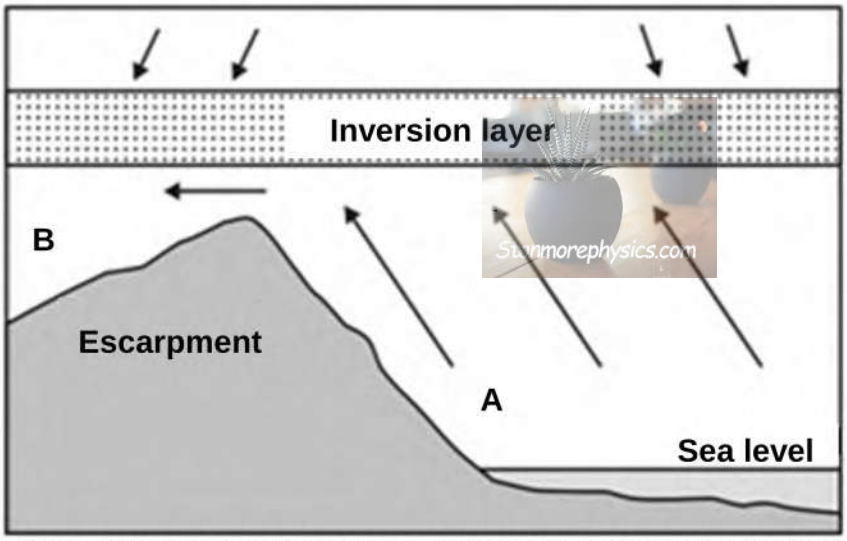
A (i) and (iv)
B (ii) and (iii)
C (i) and (ii)
D (iii) and (iv) (1 x 1) (1)

1.1.5 One measure that could be implemented to reduce temperatures in cities is:

A To plant more trees (green areas) in cities
B To use more air conditioning units
C To increase the number of motor vehicles in the cities
D To build more buildings with artificial surfaces (1 x 1) (1)

1.2 Refer to the sketch below which depicts the position of the inversion layer over South Africa and answer the questions that follow.

Read the following statements and choose the appropriate word(s) in brackets which will make the statements TRUE. Write down only the question numbers (1.2.1 and 1.2.2) and the answer in your ANSWER BOOK.

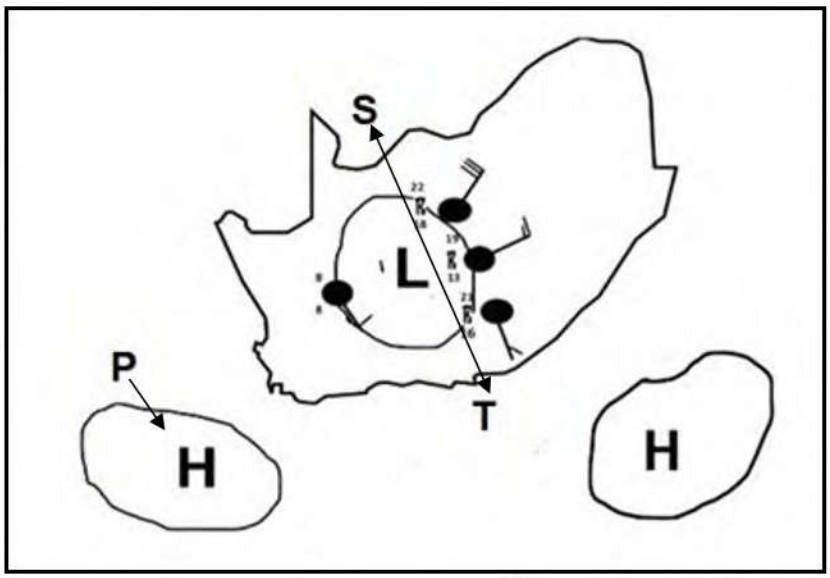



**[Source: *https://www.monyetlaproject.co.za/wp-content/uploads/2021/04/LXL_Gr12Geography_03_Subtropical-Anticyclones-Associated-Weather-Conditions*_20Feb2014-1.pdf]**

1.2.1 The season depicted in the sketch is (summer/winter). (1 x 1) (1)

1.2.2 The air at **A** is (dry/moist). (1 x 1) (1)

Refer to the sketch below depicting a weather phenomenon in South Africa and answer the questions that follow.




[Source: *mycourse.co.za*]

Read the following statements and choose the appropriate word(s) in brackets which will make them TRUE. Write down only the question numbers (1.2.3 and 1.2.4) and the answer in your ANSWER BOOK.

1.2.3 The weather phenomenon depicted in the sketch above is a (line thunderstorm/coastal low). (1)

1.2.4 The process occurring at line S – T is (upliftment of warm air by cold air/ upliftment of cold air by warm air). (1)

Stanmorephysics.com

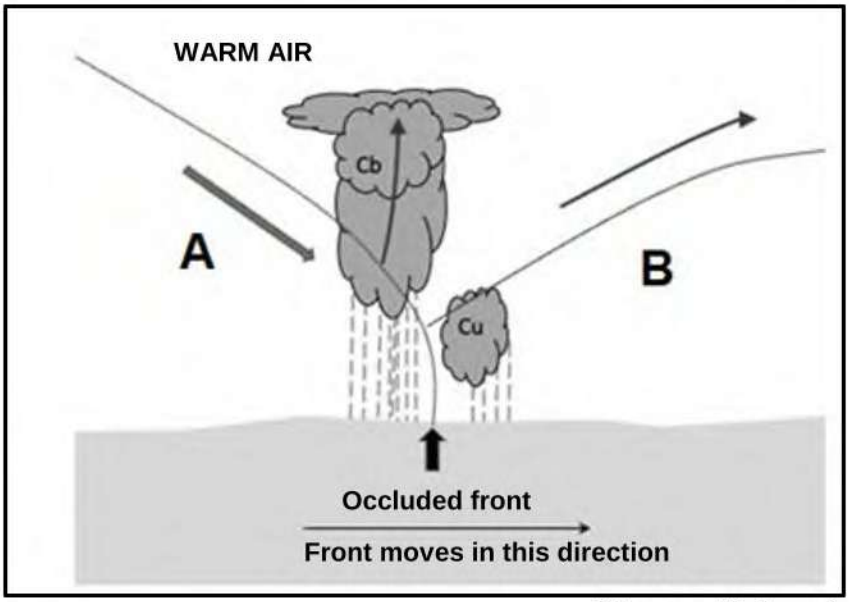
Various options are provided as possible answers to QUESTION 1.2.5. Write the correct letter (A – D) next to the question number (1.2.5) in the ANSWER BOOK.

1.2.5 The air at **P** …

(i) is cold and dry.
(ii) is warm and moist.
(iii) diverges.
(iv) converges.

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

1.3 Refer to the cross section of an occluded front depicted below and answer the questions that follow.




**[Source: Skybrary]**

1.3.1 Identify the type of occlusion shown in the sketch above. (1 x 1) (1)

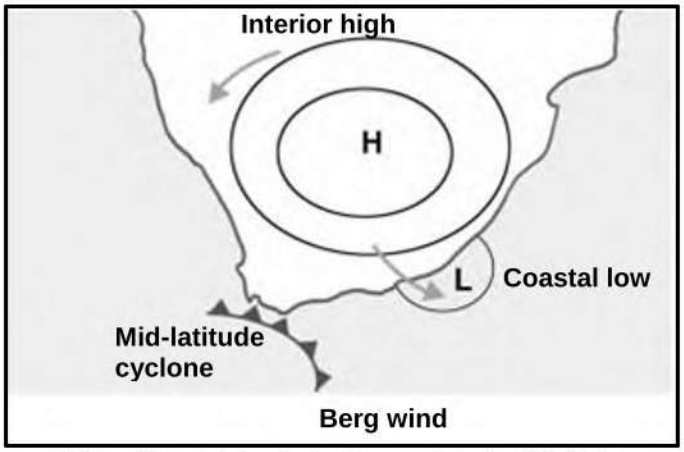
1.3.2 Provide evidence from the sketch above to support your answer to QUESTION 1.3.1. (1 x 2) (2)

1.3.3 Identify areas (sectors) **A** and **B** respectively. (2 x 1) (2)

1.3.4 Discuss how the type of occluded front shown in the sketch above is formed. (3 x 2) (6)

1.3.5 Account for the weather associated with the occluded front shown in the sketch above. (2 x 2) (4)

1.4 Refer to the infographic below on Berg winds in South Africa and answer the questions that follow.




**[Source: *https://www.istockphoto.com/vector/digital-asset-management-by-the-factories-gm687889636-126587633*]**

**DURBAN HITS 41 ºC AS BERG WINDS SWEEP THROUGH THE CITY**

Temperatures soared in Durban today as Berg winds pushed the mercury up to 43 °C in some parts of the city. The South African Weather Service (SAWS) said certain parts of KwaZulu-Natal would experience extremely hot conditions, causing high levels of discomfort. SAWS said that although these temperatures were usually associated with heatwaves, today's heat was a result of berg winds, with "high discomfort values ranging from 35 – 45 degrees Celsius expected". The rise in temperature during Berg winds can be astonishing.

mrephysics.com

**[SOURCE: *https://www-iol-co-za.webpkgcache.com/doc/-/s/www.iol.co.za/news/environment/watch-durban-hits-41c-as-berg-winds-sweep-through-city-02107112-3375-481c-a29e-6df7628999e8*]**

1.4.1 What is a *Berg wind*? (1 x 2) (2)

1.4.2 In which season do Berg winds usually occur? (1 x 1) (1)

1.4.3 Provide evidence from the infographic to support your answer to QUESTION 1.4.2. (1 x 2) (2)

1.4.4 Why did the South African Weather Service issue a warning for Berg winds? (1 x 2) (2)

1.4.5 According to the article, list ONE impact that Berg winds will have on the people of Durban. (1 x 1) (1)

1.4.6 With the use of a well-labelled diagram, show the formation of Berg winds in South Africa. Your diagram must be a cross-section view indicating the following:

(i) The average temperature of air over the interior
(ii) The average temperature of air along the coast
(iii) The general movement of air (3 x 1) (3)

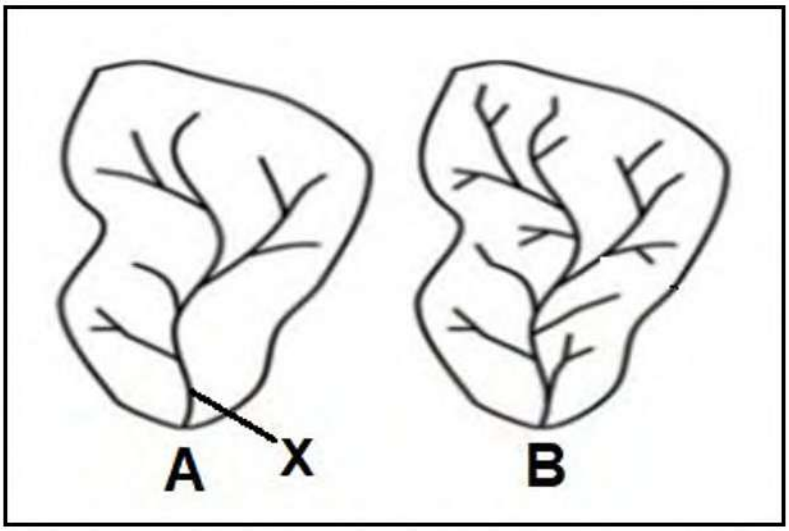
1.4.7 Explain how Berg winds have a negative impact on the natural environment. (2 x 2) (4)

**[40]**

## 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 2.1.5) in the ANSWER BOOK, e.g. 2.1.6 A.

Refer to the sketch below to answer QUESTIONS 2.1.1 to 2.1.5.




**[Source: *https://www.google.com/search?q=drainage+basin&sca_esv &tb*]**

2.1.1 Drainage density at **A** is … the density at **B.**

A higher than
B steeper than
C lower than
D the same as

2.1.2 Drainage basin **A** has a … gradient than **B**.

A gentler
B steeper
C softer
D harder

2.1.3 The stream order at point **X** is …

A 2.
B 3.
C 4.
D 5.

2.1.4 The drainage density of drainage basin **B** is different from the density of drainage basin **A** because of the following factors:

A Steeper gradient, more vegetation and high porosity
B Gentle gradient, less vegetation and low porosity
C Steeper gradient, less vegetation and low porosity
D Gentle gradient, more vegetation and high porosity

2.1.5 Drainage basin **A** is situated on an area with … and …

(i) high rainfall
(ii) gentle gradient
(iii) more vegetation
(iv) saturated soil

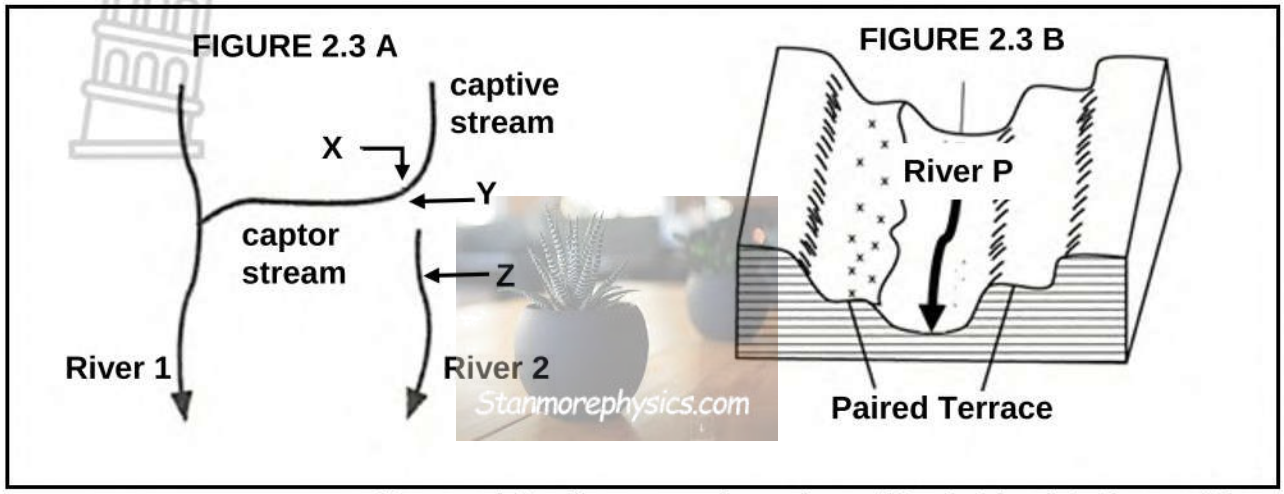
A (i) and (iv)
B (ii) and (iii)
C (iii) and (iv)
D (i) and (ii) (5 x 1) (5)

2.2 Choose the correct letter from COLUMN B (stream patterns) that matches the description in COLUMN A. Write down only **Y** or **Z** next to the question numbers (2.2.1 to 2.2.5) in the ANSWER BOOK, e.g. 2.2.6 Y.

| | COLUMN A | COLUMN B |
|---|---|---|
| 2.2.1 | Drainage patterns associated with rocks of similar types which are resistant to erosion | **Y** Dendritic<br>**Z** Trellis |
| 2.2.2 | This pattern is associated with a landscape left behind from a glacier. | **Y** Rectangular<br>**Z** Deranged |
| 2.2.3 | The pattern is associated with folded mountains. | **Y** Trellis<br>**Z** Radial |
| 2.2.4 | The pattern that develops due to massive igneous | **Y** Dendritic<br>**Z** Radial |
| 2.2.5 | Streams in this drainage basin follow the cracks on igneous rocks. | **Y** Deranged<br>**Z** Rectangular |

(5 x 1) (5)

2.3 Refer to the sketch below which shows processes of river capture and river rejuvenation and answer the questions that follow.




[Source: *https://www.google.com/search?q=knickpoint+diagram&tbm=isch&hl=en&chips=q:knickpoint+diagram,online*]

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

2.3.2 Identify features **X, Y** and **Z** associated with river capture as indicated in FIGURE 2.3 A. (3 x 1) (3)

2.3.3 Name a climatological factor and a geomorphological factor that could enable (allow) river **P** to undergo the process of rejuvenation. (2 x 1) (2)

2.3.4 Provide evidence of river rejuvenation in FIGURE 2.3 B. (1 x 1) (1)

2.3.5 Explain the impact that river rejuvenation will have on the grading of river **P**. (1 x 2) (2)

2.3.6 Describe the changes that River **1** will undergo due to the process of river capture. (1 x 2) (2)

2.3.7 Draw a well labelled free-hand side view of river **P** after the process of river rejuvenation has taken place, and clearly indicate the position of the knickpoint (2 + 1) (3)

2.4 Refer to the extract on river management and answer the questions that follow.

**POLLUTION IN THE JUKSKEI RIVER**

Pollution in the Jukskei River is a multifaceted, generational problem influenced by population expansion, illegal dumping, overwhelmed service-providers and insufficient infrastructure. Raw sewage runs into the river from informal dwellings on its banks, leaks from blockages in the township, and even from sewage leaks from hijacked buildings in Marlboro South. People often see trucks from construction sites in Sandton illegally dumping rubble onto the riverbanks.

"Water is our oldest resource," says Paul Maluleke, a volunteer with the Alexandra Water Warriors, who are now deploying a nifty device they call "The pollution trap" to snare sewage and plastic in the Jukskei.

"On World Water Day we helped to install a floating trap made appropriately of large water bottles, tied with wire to a strong cable and covered with netting. This will catch the floating filth and bottles."

**[Source: Adapted from *https://www.google.com/search?q=what+is+drainage+basin+management&sca*]**

2.4.1 Define the concept *river management.* (1 x 2) (2)

2.4.2 Identify a cause of pollution from the extract. (1 x 1) (1)

2.4.3 Quote evidence from the extract which shows that there is an attempt (to try) at river management by people living near the Jukskei river. (1 x 2) (2)

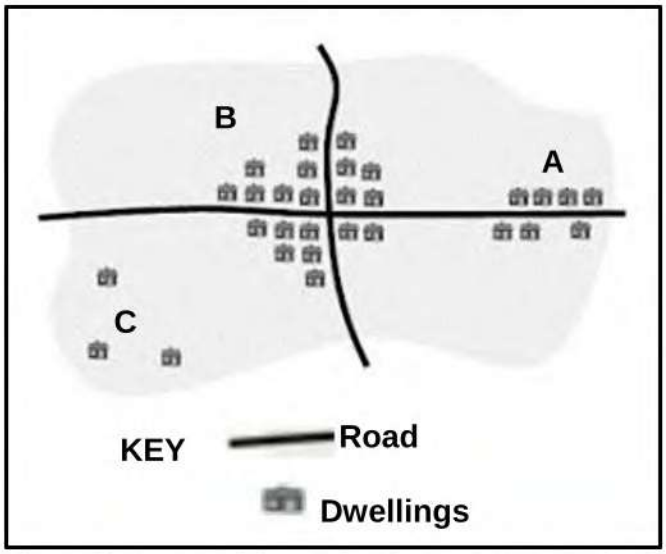
2.4.4 Explain the importance of river and drainage basin management. (1 x 2) (2)

2.4.5 In a paragraph of approximately EIGHT lines, discuss the challenges that poor river management will have for the people living along riverbanks, e.g. the Jukskei River, and suggest sustainable strategies that may be implemented to preserve rivers and their drainage basins. (4 x 2) (8)

**[40]**

## QUESTION 3: SETTLEMENT GEOGRAPHY

3.1 Refer to the sketch below. 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.




**[Source: *https://gpres.weebly.com/settlement-patterns.html*]**

3.1.1 The social advantage of settlement **B** is:

(i) There is more interaction with people.
(ii) There is competition for resources.
(iii) Protection is easier.
(iv) There is not enough space for everyone.

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

3.1.2 The economic advantage of settlement **C** is that …

(i) farming can be done on a commercial scale.
(ii) it is very isolated.
(iii) farms can be mechanised to increase production.
(iv) there is no social interaction.

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

3.1.3 Settlement **A** is ... shaped and influenced by the …

A linear; road.
B straight, slope.
C long, road.
D crossroads, railway.

3.1.4 The physical factor influencing the site of a settlement is …

A relief.
B transport routes.
C distance from the market.
D job opportunities.

3.1.5 Rural settlements are predominantly associated with …

A primary activities.
B secondary activities.
C tertiary activities.
D quaternary activities.

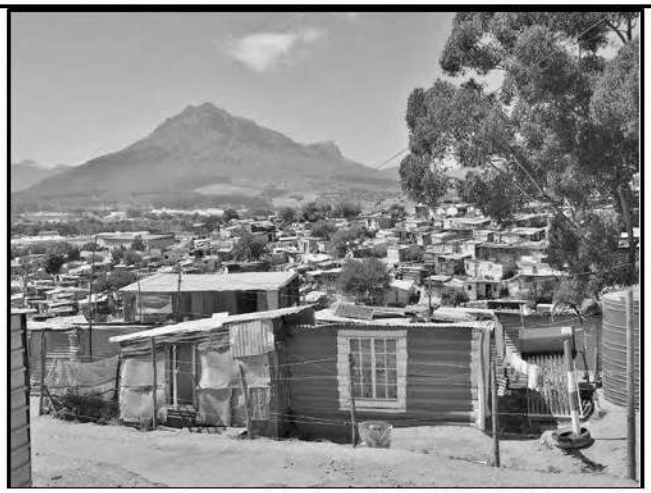
(5 x 1) (5)

3.2 Choose a term from COLUMN B that matches the illustration in COLUMN A. Write down only the letter (**Y** or **Z**) next to the question numbers (3.2.1 to 3.2.5) in the ANSWER BOOK, e.g. 3.2.6 Y.

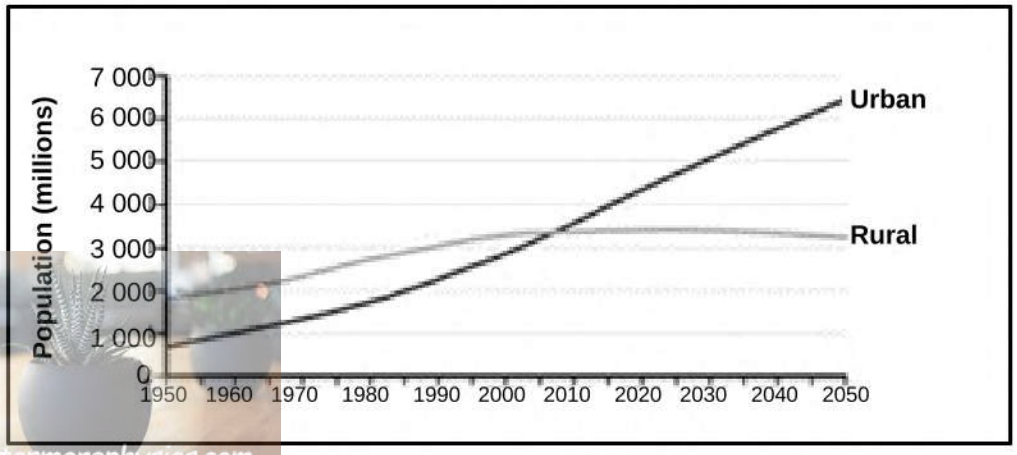
| COLUMN A | COLUMN B |
|---|---|
| 3.2.1   | **Y** High order goods<br>**Z** Low order goods |
| 3.2.2    | **Y** High order goods<br>**Z** Low order goods |
| 3.2.3  **RAINBOW REGIONAL SHOPPING CENTRE** | **Y** High order centre<br>**Z** Low order centre |
| 3.2.4   | **Y** High order service<br>**Z** Low order service |
| 3.2.5   | **Y** High order service<br>**Z** Low order service |

(5 x 1) (5)

3.3 Refer to the infographic on rural-urban migration and answer the questions that follow.



**Source: *https://www.bizcommunity.com/ Article/196/701/212155.html*]**




Stanmorephysics.com

**[Source: *https://www.open.edu/openlearncreate/ mod/oucontent/view.php?id=79940&printable=1*]**

Unfortunately, city life has its own challenges, as new migrants continue to arrive which adds to the numbers of the unemployed. This inevitably results in further urban poverty. As a result, the unemployed labour force resorts to informal economic activities to ensure its survival.

The unskilled and uneducated new migrants often do not find jobs or find jobs with low incomes. With a low income it is difficult to rent formal urban accommodation. This then results in the mushrooming of slums on the periphery of urban areas. The crime rate and other social ills such as drug dealing are also on the rise in urban areas.

**[Source: Adapted from *https://jolgri.org/index.php/jolgri/article/view/56/218*]**

3.3.1 Define the term *rural-urban migration*. (1 x 2) (2)

3.3.2 With reference to the infographic, identify the trend in the number of people living in urban areas from 1950 to 2020. (1 x 1) (1)

3.3.3 Account for the trend identified in QUESTION 3.3.2. (1 x 2) (2)

3.3.4 Quote evidence from the extract above that suggests that the movement of people into the urban areas has an economic disadvantage. (1 x 2) (2)

3.3.5 According to the infographic, identify ONE social injustice in the urban areas that arises from the increase in the urban population. (1 x 2) (2)

3.3.6 Suggest THREE measures that can be implemented in rural areas to reduce the number of people leaving. (3 x 2) (6)

3.4 Refer to the urban problem depicted in the photo.



**[Source: *https://learningenglish.voanews.com/a/is-there-an-answer-for-traffic-congestion-/5323360.html*]**

3.4.1 Identify the urban problem depicted in the photo above. (1 x 1) (1)

3.4.2 With reference to the photo above, list ONE cause of the urban problem mentioned in QUESTION 3.4.1. (1 x 2) (2)

3.4.3 Evident in the photo above is a sustainable solution to this urban problem. Describe the sustainable solution. (1 x 2) (2)

3.4.4 Suggest ONE possible reason why the solution, mentioned in QUESTION 3.4.3, has still not helped to resolve this specific urban problem. (1 x 2) (2)

3.4.5 In a paragraph of approximately EIGHT lines, discuss how this urban problem negatively impacts commuters. (4 x 2) (8)

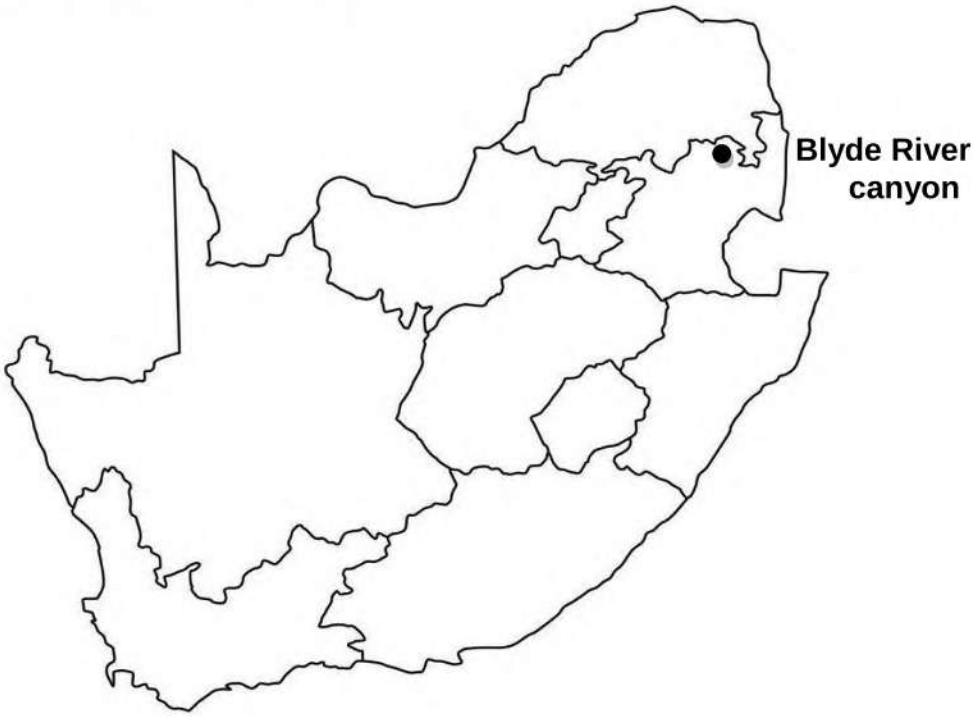
**[40]**

**TOTAL SECTION A: 120**

**SECTION B**

**QUESTION 4: GEOGRAPHICAL SKILLS AND TECHNIQUES**

**GENERAL INFORMATION ON THE BLYDE RIVER CANYON/BOURKE'S LUCK**




**LOCATION: 24º39'10''S; 30º45'30''E**

The Blyde River Canyon, sometimes referred to as Motlatse Canyon, is a very large canyon that is considered to be among the largest in the entire world. It is located in the province of Mpumalanga, in the eastern part of South Africa. Being 26 km long, it is the third-largest canyon in the world, and unlike other canyons, the Blyde River Canyon is dominated by subtropical vegetation which makes it a very green and lush place.

The geology and climate of this high rainfall plateau results in masses of waterfalls that are mesmerising to look at, and perhaps the most interesting one is the Kadishi Waterfalls which, with its 200 metres height, represents the "weeping face" of Mother Nature.

**[Source: Adapted from *https://www.alluringworld.com/blyde-river-canyon/*]**

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

| **ENGLISH** | **AFRIKAANS** |
|---|---|
| Hiking trail | Staproete |
| Caravan Park | Karavaanpark |
| Diggings | Uitgrawings |
| Golf Course | Gholfbaan |
| Furrow | Kanaal |
| Holiday Resort | Vakansieoord |
| Viewpoint | Uitkykpunt |
| Landing Strip | Landingstrook |

## 4.1 MAP SKILLS AND CALCULATIONS

4.1.1 The grid reference of the block east of 2430DB_06 on the orthophoto map is:

A 2430DB_04
B 2430DB_07
C 2430DB_05
D 2430DB_03 (1 x 1) (1)

4.1.2 The landform at **F** on the topographic map is a …

A valley.
B spur.
C neck.
D canyon. (1 x 1) (1)

4.1.3 Determine the gradient of the slope in block **B2** from spot height 1 294 to spot height 1 084 if the vertical interval is 210 m and the map distance is 1,7 cm.

***Formula:*** $\frac{VI}{HE}$ (3 x 1) (3)

4.1.4 Determine the magnetic bearing from **H** in block **A3**, where the hiking trail starts, to the bridge in blocks **C4** and **D4**. Use the total change of 9' west (2024). (3 x 1) (3)

4.1.5 How does the calculation of magnetic bearing assist hikers in this area? (1 x 2) (2)

## 4.2 MAP INTERPRETATION

4.2.1 Refer to the settlements at **I** on the orthophoto map.

(a) Give a possible climatological factor for the location of the settlements on the slope at **I.** (1 x 1) (1)

(b) Give a reason for your answer to QUESTION 4.2.1 (a). (1 x 2) (2)

4.2.2 Refer to the topographic map.

(a) Give evidence of a temporary base level of erosion from the general information. (1 x 1) (1)

(b) Identify the fluvial landform in blocks **D4** and **E4**. (1 x 1) (1)

4.2.3 Refer to block B3 on the topographic map.

(a) Name the drainage pattern in block **B3**. (1 x 1) (1)

(b) Give a reason for the pattern in block **B3**. (1 x 2) (2)

4.2.4 Refer to the settlements at **G**.

The settlement shape at **G** is … due to a …

(i) linear
(ii) dispersed
(iii) river
(iv) road

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

4.2.5 Give an advantage of the location of the settlements at **G**, evident on the topographic map. (1 x 2) (2)

4.2.6 List ONE low order service offered by the settlement Apara in block **E1**. (1 x 1) (1)

## 4.3 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

4.3.1 Name TWO components of GIS that was used to compile the orthophoto map. (2 x 1) (2)

4.3.2 Name ONE data layer in block **B2** on the orthophoto map. (1 x 1) (1)

Refer to the topographic map.

4.3.3 (a) How is spatial data represented in block **D1**? (1 x 2) (2)

(b) Give the attribute data for the polygon feature in block **D1**. (1 x 1) (1)

4.3.4 Why is data manipulation beneficial for a GIS company? (1 x 2) (2)

**TOTAL SECTION B: 30**

**TOTAL: 150**



END