Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2023

GEOGRAPHY P1

MARKS: **150**

TIME: **3 hours**

This question paper consists of 18 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO SECTIONS.

   SECTION A:
   QUESTION 1: The Atmosphere (60)
   QUESTION 2: Geomorphology (60)

   SECTION B:
   QUESTION 3: Geographical Skills and Techniques (30)

2. Answer all THREE questions.

3. ALL diagrams are included in the QUESTION PAPER.

4. Leave a line between subsections of questions answered.

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

6. Number the questions 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 topographical map (3419 AB CALEDON) and an orthophoto map (3419AB 24 CALEDON) of a part of the mapped area are provided.

15. The area demarcated in RED/BLACK on the topographic map represents the area covered by the orthophoto map.

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

17. You must hand in the topographic and the orthophoto map to the invigilator at the end of this examination session.

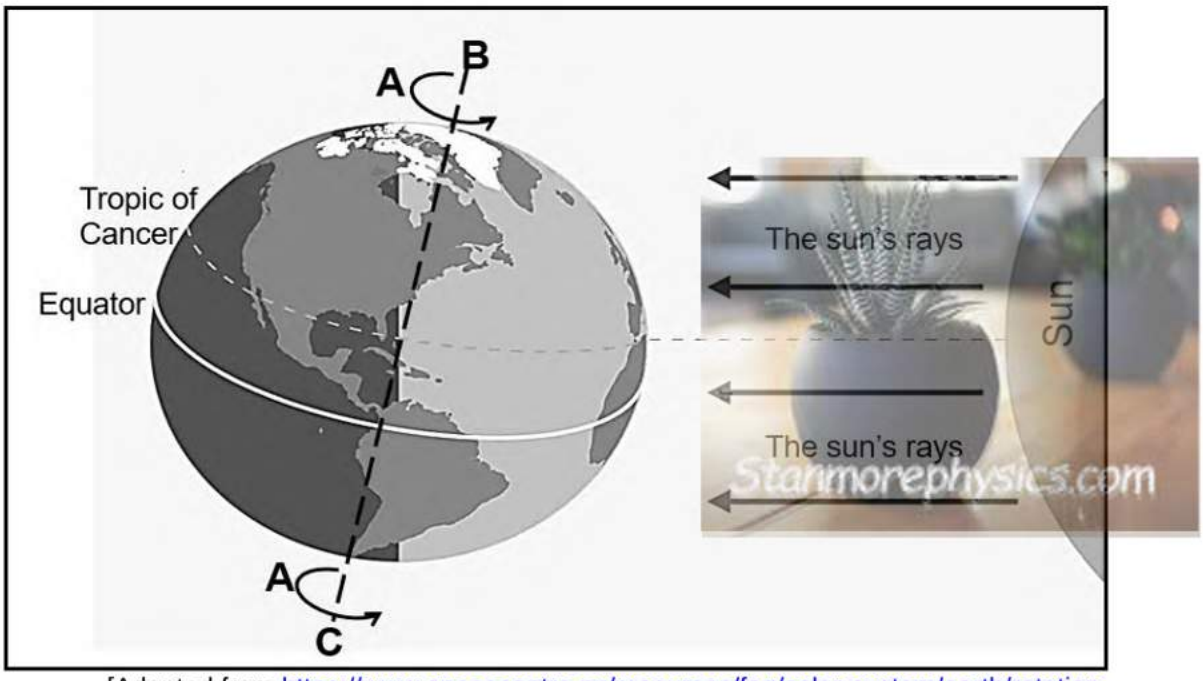
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SECTION A: CLIMATE AND WEATHER AND GEOMORPHOLOGY

QUESTION 1: THE ATMOSPHERE

1.1 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 (1.1.1 to 1.1.8) in the ANSWER BOOK, for example 1.1.9 D.

Refer to the sketch below of the earth's axis to answer QUESTIONS 1.1.1 to 1.1.5.



[Adapted from https://www.spacecentre.nz/resources/faq/solar-system/earth/rotation-speed.html]

1.1.1 The season, the southern hemisphere experiences is …

A autumn.
B winter.
C spring.
D summer.

1.1.2 The arrows at **A** shows the … of the earth.

A circle of illumination
B revolution
C rotation
D circle of parallelism

1.1.3 The sketch illustrates a/an … situation, with the days being … than/to the night at the equator.

(i) solstice
(ii) equinox
(iii) longer
(iv) equal

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

1.1.4 Line **B**–**C** represents the … of the earth's axis and is … throughout the year.

(i) dynamism
(ii) parallelism
(iii) consistent
(iv) inconsistent

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

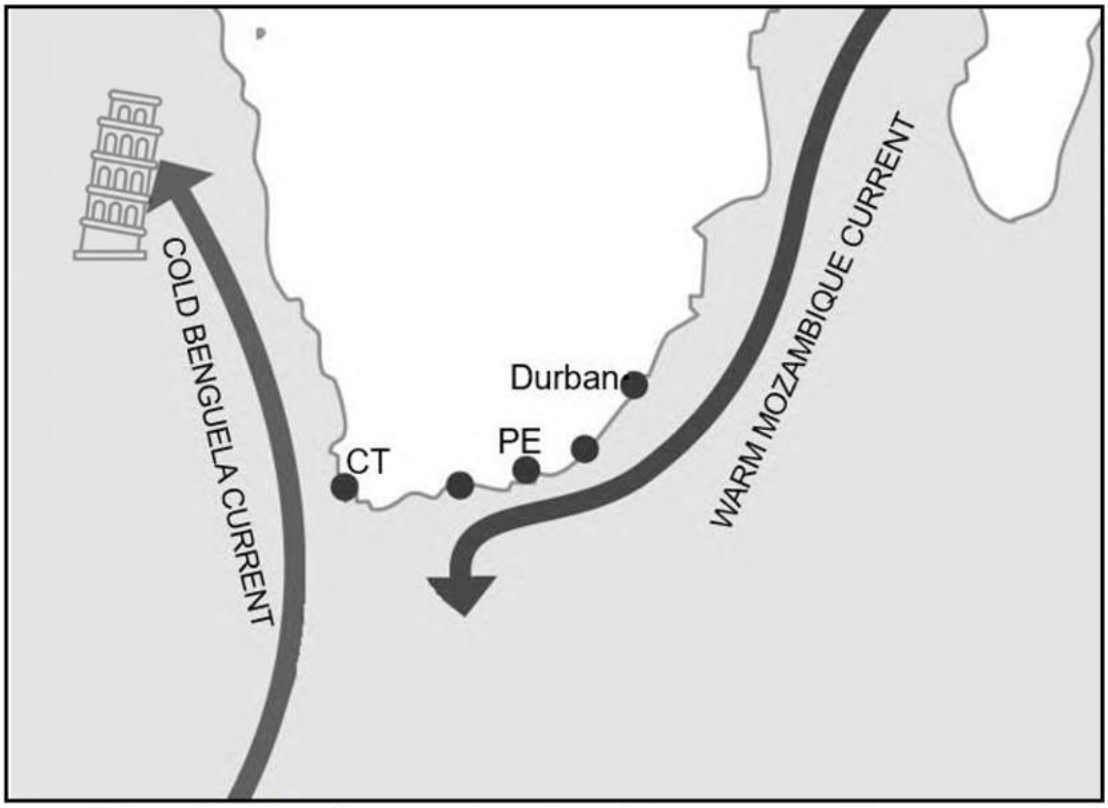
1.1.5 The amount of insolation that the earth receives depends on … and …

(i) latitude
(ii) rotation
(iii) seasons
(iv) revolution

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

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Refer to the below sketch on ocean currents to answer QUESTIONS 1.1.6 to 1.1.8.



[Adapted from https://www.google.com/search?q=Warm+Mozanbique+current&tbm=]

1.1.6 The ocean currents in the sketch play a combined role in shaping weather patterns by …

A increasing temperatures.
B moderating temperatures.
C decreasing temperatures.
D increasing rainfall.

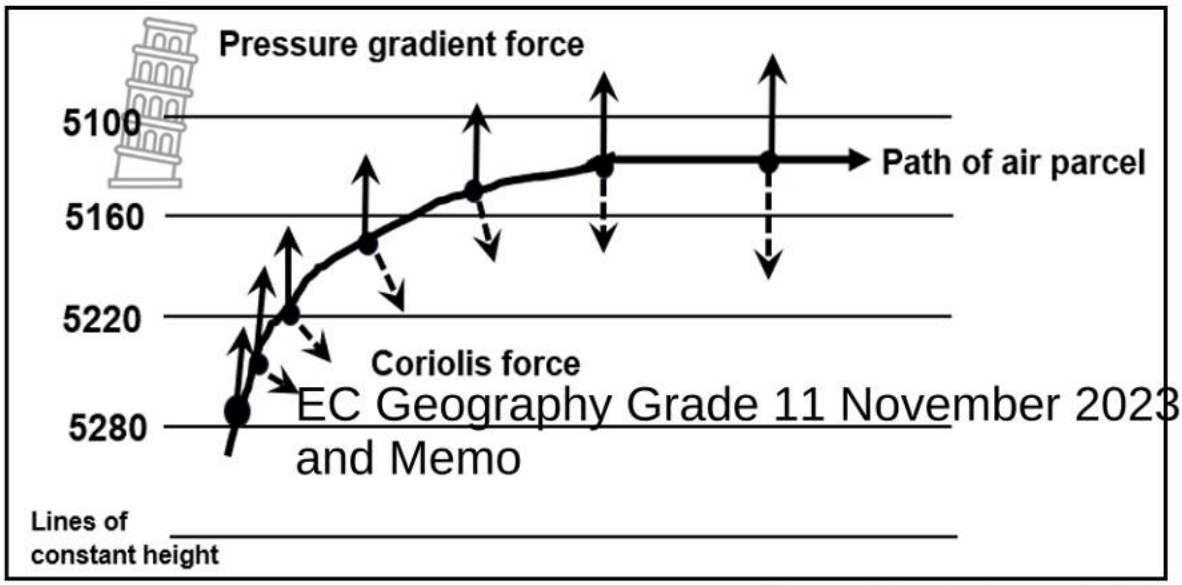
1.1.7 The cold Benguela Ocean current transfers … air from the poles to the … zones.

A cold; temperate
B warm; coastal
C cold; coastal
D warm; desert

1.1.8 Warm ocean currents move from the … to the …

A poles; equator.
B west; poles.
C east; equator.
D equator; poles. (8 x 1) (8)

1.2 Refer to the sketch on the direction and speed of wind. Choose the correct word(s)/number(s) from those given in brackets to complete the following sentences. Write only the word(s)/number(s) next to the question numbers (1.2.1 to 1.2.7) in the ANSWER BOOK.



EC Geography Grade 11 November 2023 P1 and Memo

[Source: Examiner's own sketch]

1.2.1 The lines in the sketch showing places of equal pressure are known as (contours/isobars).

1.2.2 The high pressure is represented by (5280/5100) hectopascals.

1.2.3 (Coriolis/Pressure gradient) force determines the speed of the wind.

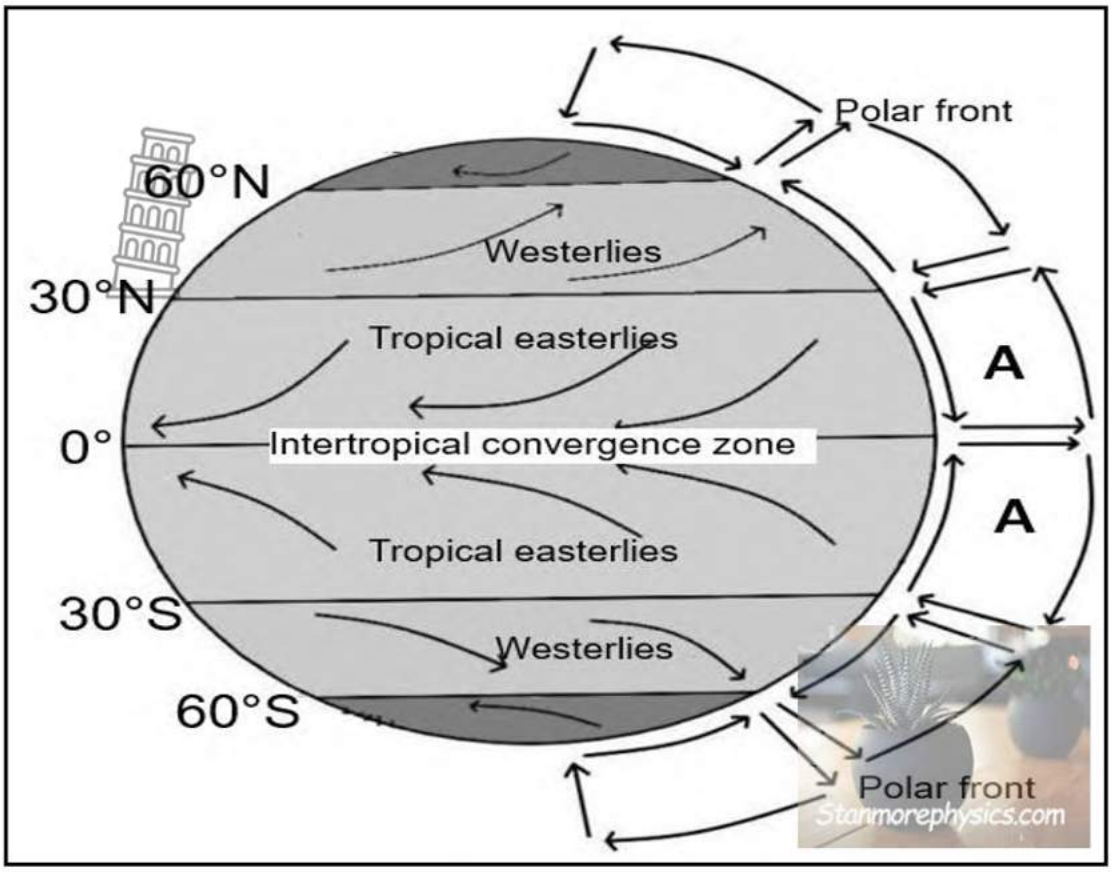
1.2.4 Winds deflect or change direction because of (Pressure gradient/Coriolis force).

1.2.5 The direction of the wind in the sketch above represents conditions in the (southern/northern) hemisphere.

1.2.6 The greater the difference in air pressures between high- and low-pressure cells, the (stronger/weaker) the wind.

1.2.7 Geostrophic (balance/flow) is a theoretical wind that blows parallel to the isobars. (7 x 1) (7)

1.3 Refer to the sketch on global air circulation.



1.3.1 What is the *intertropical convergence zone*? (1 x 2) (2)

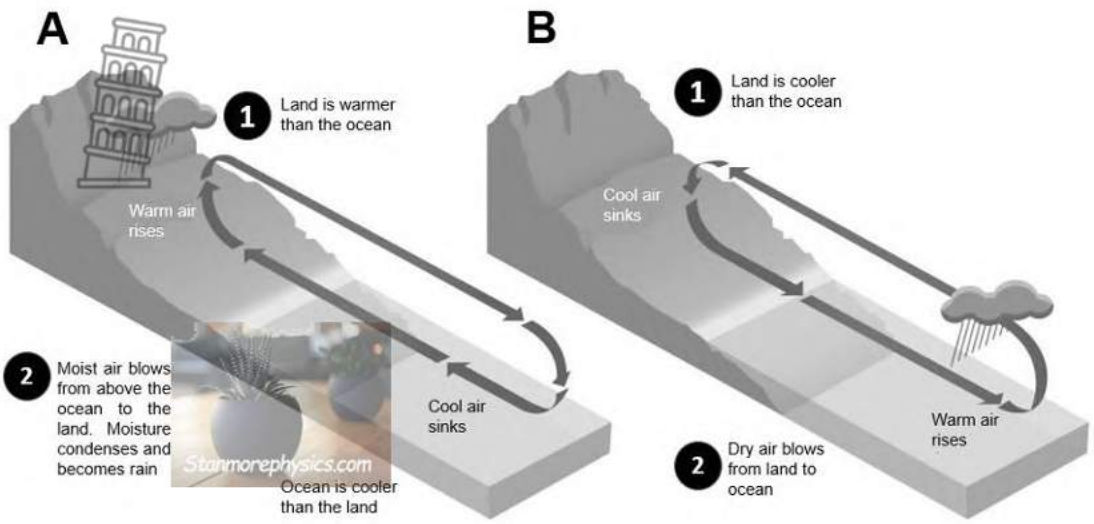
1.3.2 Name the global cell at **A**. (1 x 1) (1)

1.3.3 How does a polar front form? (2 x 2) (4)

1.3.4 In a paragraph of approximately EIGHT lines, explain the movement of tropical easterlies and westerly winds and its impact on weather in regions that they occur. (4 x 2) (8)

1.4 Refer to the sketch and extract of a monsoon wind.

WINDS SET THE STAGE FOR APPROACH OF MONSOON WIND



The crucial southwest monsoon wind starts its journey into the Indian subcontinent from the coast around 1 June with a standard deviation of about seven days. Monsoon rainfall is critical for agricultural production, which accounts for about 18% of the economy and is the largest employer.

[Adapted from *deccanherald*]

1.4.1 Match sketch **A** with either a summer or winter monsoon wind over the subcontinent of India. (1 x 1) (1)

1.4.2 Identify the direction of the monsoon wind, according to the extract, that blows in sketch **A**. (1 x 1) (1)

1.4.3 Why does this wind that you identified in QUESTION 1.4.2 bring heavy rainfall to the Indian subcontinent? (1 x 1) (1)

1.4.4 What positive physical (natural) impact will this heavy rainfall have on the Indian subcontinent? (2 x 2) (4)

Refer to sketch **B**.

1.4.5 Describe the weather conditions that would prevail over the Indian subcontinent in sketch **B**. (2 x 1) (2)

1.4.6 Explain the negative economic impact that the subcontinent of India would experience if the conditions in sketch **B** are prolonged (continued). (3 x 2) (6)

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1.5 Refer to the map and extract on desertification.



Soaring temperatures and improper disaster management have resulted in increased desertification rates across the globe. Coupled with droughts and a drop in agricultural productivity, the effects of desertification cannot be ignored. To curb such high rates of land degradation that many regions of the world are experiencing, effective risk management is needed. Desertification is a huge issue also in Africa.

For example, poor harvesting and a surge in barren lands continue to plague the inhabitants of Tanzania. In Mauritania, a drop in rainfall has worsened agricultural production and has left many farmers struggling to grow enough food to eat or sell. Desertification can also cause loss of biodiversity and loss of *aquifers. In Africa, with nearly 45% of the landmass experiencing desertification, many people face even greater risks. In Mauritania, the dire situation has caused food insecurity, housing problems and population health declines. Villagers are trying to migrate as their houses become buried under the sand in addition to a lack of water sources and income.

* A body of rock or sediment saturated with groundwater.

[Source: https://earth.org/desertification-in-africa/]

1.5.1 What is *desertification*? (1 x 2) (2)

1.5.2 Identify the major desert on the map. (1 x 1) (1)

1.5.3 State ONE negative physical (natural) impact, according to the extract, of desertification. (1 x 1) (1)

1.5.4 Why is the Sahel regarded as a high-risk area? (1 x 1) (1)

1.5.5 Explain the negative social impact that a drop in agricultural productivity will have on the people of Africa. (2 x 2) (4)

1.5.6 Suggest measures that farmers could implement to reduce the spread of desertification. (3 x 2) (6)

[60]

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QUESTION 2: GEOMORPHOLOGY

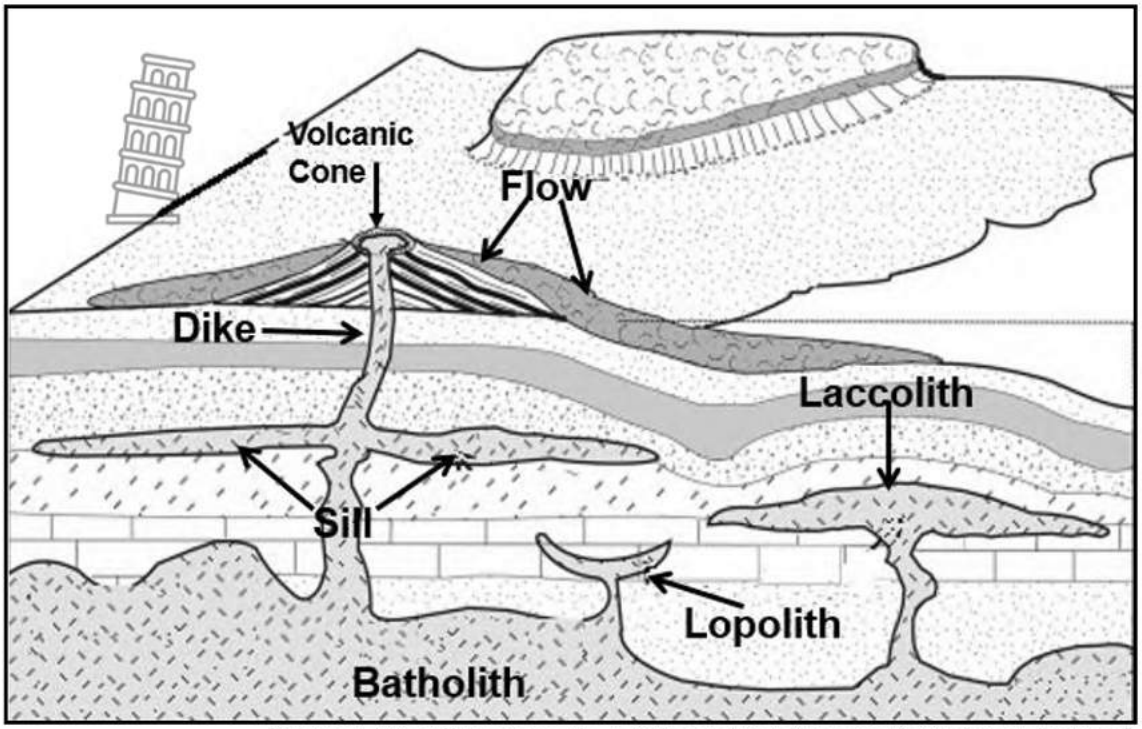
2.1 Complete the statements in COLUMN A with the options in COLUMN B. Write only **X** or **Y** next to question numbers (2.1.1 to 2.1.8) in the ANSWER BOOK, for example 2.1.9 Y.

	COLUMN A	COLUMN B	
2.1.1	Forms from layers of lava that flow horizontally onto the earth's surface	**X** **Y**	hilly landscape basaltic plateau
2.1.2	Type of weathering causing exposed igneous rocks to peel off	**X** **Y**	sheetwash exfoliation
2.1.3	The dip slope faces outward, and the scarp slope faces inwards	**X** **Y**	cuesta dome cuesta basin
2.1.4	The relief region that lies between the plateau and coastal plains	**X** **Y**	plateau slopes great escarpment
2.1.5	Top soil becomes saturated and slides on the frozen ground	**X** **Y**	earthflow solifluction
2.1.6	Rapid movement of material down a slope will be increased by …	**X** **Y**	steep slopes thick vegetation
2.1.7	Assymmetrical ridge with a gentle dip slope between 10–25	**X** **Y**	hogsback cuesta
2.1.8	Forms from hard rock that weathers slowly	**X** **Y**	dip slope scarp slope

(8 x 1) (8)

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2.2 Refer to the sketch on intrusive landforms. Choose the correct landform from the sketch that the description below refers to. Write only the landform next to the question numbers (2.2.1 to 2.2.7) in the ANSWER BOOK.



[Source: https://www.google.com/search?q=igneous+intrusions+diagram]

2.2.1 The largest of all intrusive forms

2.2.2 A vertical intrusion of igneous rock that forms a wall

2.2.3 When magma is exposed on the earth's surface

2.2.4 Igneous intrusion that forms when strata is forced upwards

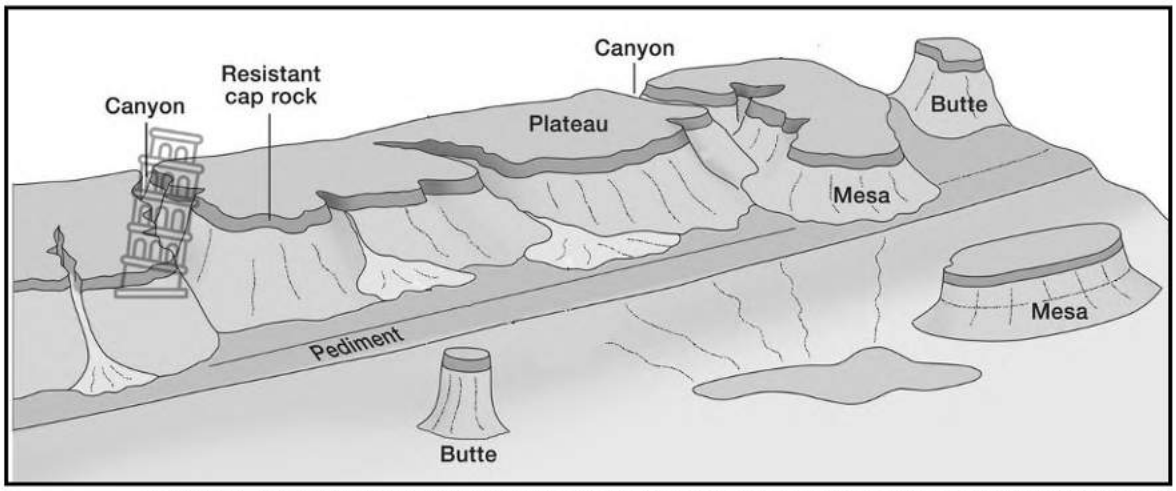
2.2.5 A horizontal intrusion of igneous rock that forms a sheet

2.2.6 Igneous intrusion that forms when sedimentary strata create a basin

2.2.7 A triangle-shaped hill formed from material of eruptions (7 x 1) (7)

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2.3 Refer to the sketch on topography associated with horizontally layered rocks.



[Source: https://www.google.com/search?q=topography+associated+with+horizontally]

2.3.1 Comment on the height of the topography evident in the sketch. (1 x 1) (1)

2.3.2 Provide evidence from the sketch for your answer to QUESTION 2.3.1. (1 x 1) (1)

2.3.3 The topography above is (uniformly/not uniformly) resistant to erosion. (1 x 1) (1)

2.3.4 How do canyons form? (2 x 2) (4)

2.3.5 Explain how the elements of the Karoo landscape evident in the sketch will form from a canyon landscape. (2 x 2) (4)

2.3.6 How can the topography in the sketch associated with horizontally layered rocks be utilised economically by people? (2 x 2) (4)

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2.4 Refer to the photos on topography associated with massive igneous rocks.

A



B



2.4.1 Identify the landforms associated with massive igneous rocks in photo **A** and photo **B**. (2 x 1) (2)

2.4.2 Name ONE characteristic of massive igneous rocks that is evident in the sketch. (1 x 1) (1)

2.4.3 From what igneous intrusions do the landforms in photo **A** and photo **B** originate? (2 x 1) (2)

2.4.4 How are these landforms in photo **A** and photo **B** exposed on the earth's surface? (1 x 2) (2)

2.4.5 In a paragraph of approximately EIGHT lines, explain the role of weathering in the formation of these two landforms. (4 x 2) (8)

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2.5 Refer to the photograph and extract on a landslide.



[Source: google images]

In eThekwini, combinations of sloping ground, water and clay left trails of devastation in their wake during the recent floods.

Some articles have suggested the catastrophes in Durban and the greater eThekwini region of South Africa following recent floods are due to climate change and maladministration. While these factors play a role, the fact that landslides occurred comes as no surprise, considering the geology of the area.

eThekwini is a coastal metropolis characterised by hilly terrain dissected by several major rivers such as the Umgeni, Mlazi and Mbokodweni. The region is subtropical, but recent rains were abnormal relative to recent records and resulted in multiple landslides. The negative social, economic, and physical impact on the region has been disastrous.

[Adapted from an article by Charles Macrobert]

2.5.1 How does the photograph depict a landslide? (1 x 1) (1)

2.5.2 According to the article, what is the main cause of landslides in the greater eThekwini region. (1 x 1) (1)

2.5.3 What climatic evidence in the article suggests that the eThekwini region receives high rainfall? (1 x 1) (1)

2.5.4 What role did heavy rainfall play in the development of landslides? (2 x 2) (4)

2.5.5 Account for the negative social impact of landslides in the region. (2 x 2) (4)

2.5.6 Suggest strategies that the municipality of eThekwini could adopt to minimise the effects of landslides. (2 x 2) (4)

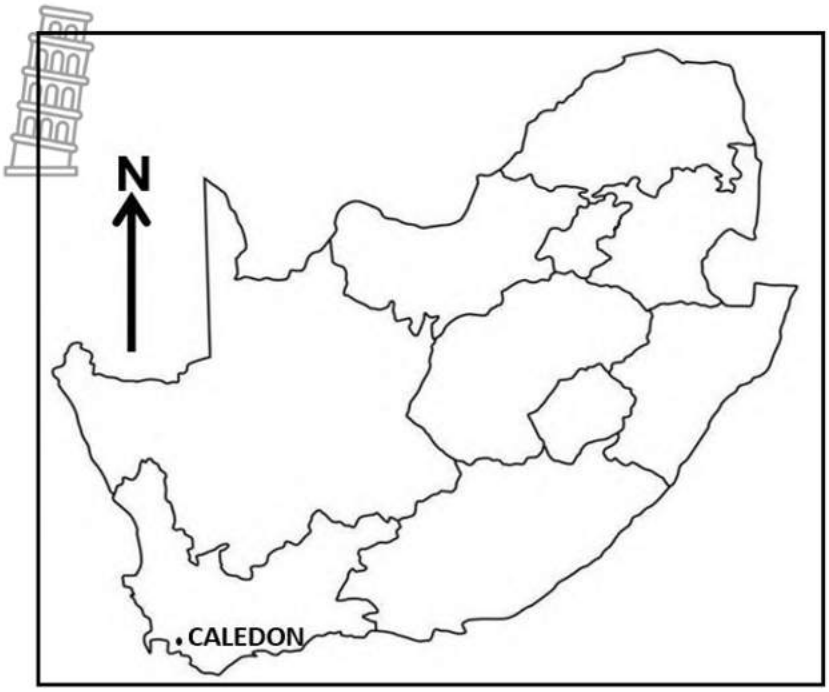
[60]

TOTAL SECTION A: 120

SECTION B

QUESTION 3: GEOGRAPHICAL SKILLS AND TECHNIQUES

GENERAL INFORMATION ON CALEDON



Co-ordinates: 34° 13′ S ; 19° 25′ E

Caledon has a Mediterranean climate of warm, dry summers and cool, wet winters. Temperatures are modified by its close proximity to the South Atlantic Ocean, just over the Klein River Mountains to the south.

[Source: https://en.wikipedia.org/wiki/Calendon,_Western_Cape]

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

ENGLISH	**AFRIKAANS**
Caledon Casino and Spa Resort	Caledon Casino en Spa-oord
Nature Reserve	Natuurreservaat
Show Grounds	Skougronde
Hot Spring	Warmwaterbronne
Sewage Disposal Works	Rioolverwerkingsaanleg
Silo	Graansuier
Marshes and vlei	Moeras en vlei
Diggings	Uitgrawings

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3.1 MAPWORK SKILLS AND CALCULATIONS

3.1.1 The topographic map number 3419 refers to the ...

A longitude and latitude.
B latitude and longitude.
C contour line and isobar.
D longitude and contour lines. (1 x 1) (1)

3.1.2 The scale of the orthophoto map is … times larger than the scale of the topographic map.

A 5
B 10
C 20
D 40 (1 x 1) (1)

3.1.3 The length (L) of the hospital (Area **2**) on the orthophoto map is … centimetres (cm).

A 30
B 13
C 3
D 1,4 (1 x 1) (1)

3.1.4 The breadth (B) of the hospital (Area **2**) on the orthophoto map is … centimetres (cm).

A 0,3
B 13
C 3,3
D 1,3 (1 x 1) (1)

3.1.5 Using the answers from QUESTIONS 3.1.3 and 3.1.4, calculate the area of the hospital **2** in square meters (m^2). Show ALL calculations. Marks will be awarded for calculations.

Formula: **Area = length (L) x breadth (B)** (3 x 1) (3)

3.1.6 Calculate the magnetic declination of Caledon for 2023. Use the information and steps given below.

Difference in years: 22 years

Mean annual change: 4' westwards

Total change: _____

Magnetic declination for 2023: _____

_____ (3 x 1) (3)

3.2 MAP INTERPRETATION

3.2.1 What type of climate does Caledon experience? Give a reason for your answer. (1 + 1) (2)

Refer to the topographical and orthophoto maps.



3.2.2 The letter **3** on the orthophoto map indicates a ...

A sewerage plant.
B reservoir.
C silo.
D power station. (1 x 1) (1)

3.2.3 Rainfall over the mapped area is seasonal. Give TWO pieces of evidence, from the map in blocks **E1/2**, of measures farmers use to overcome the problem of water shortage during times of low rainfall. (2 x 1) (2)

3.2.4 The Caledon town council has decided to try and improve the level of development of this area through tourism. Explain how the council would promote this area using evidence from blocks **D3/4** and **E3/4**. (2 x 2) (4)

Refer to **2** in block **E2** on the orthophoto map.

3.2.5 The main economic activity at **2** in block **E2** on the orthophoto map is (secondary / tertiary). (1 x 1) (1)

3.2.6 Explain why area **2** was suitable for the development of the economic activity identified in QUESTION 3.2.5. (1 x 2) (2)

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3.3 GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

3.3.1 The topographic map is an example of … data.

A raster
B pixelated
C vector
D attribute (1 x 1) (1)

Study the photo of the road in block **B5** that goes up to the Basil Newmark Reservoir.

3.3.2 Define *spatial data.* (1 x 1) (1)

3.3.3 What type of spatial object (point, line or polygon) is the road? (1 x 1) (1)

3.3.4 Name ONE attribute that can be captured for the secondary road. (1 x 1) (1)

3.3.5 Due to the increase in Caledon's population, the water in the Badsrivier at **G,** is decreasing in quality.

(a) Mention TWO ways in which data can be collected to do an environmental impact study surrounding the river. (2 x 1) (2)

(b) Explain how the collected data can be used to protect the affected river against further deterioration. (1 x 2) (2)

TOTAL SECTION B: 30
GRAND TOTAL: 150

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